

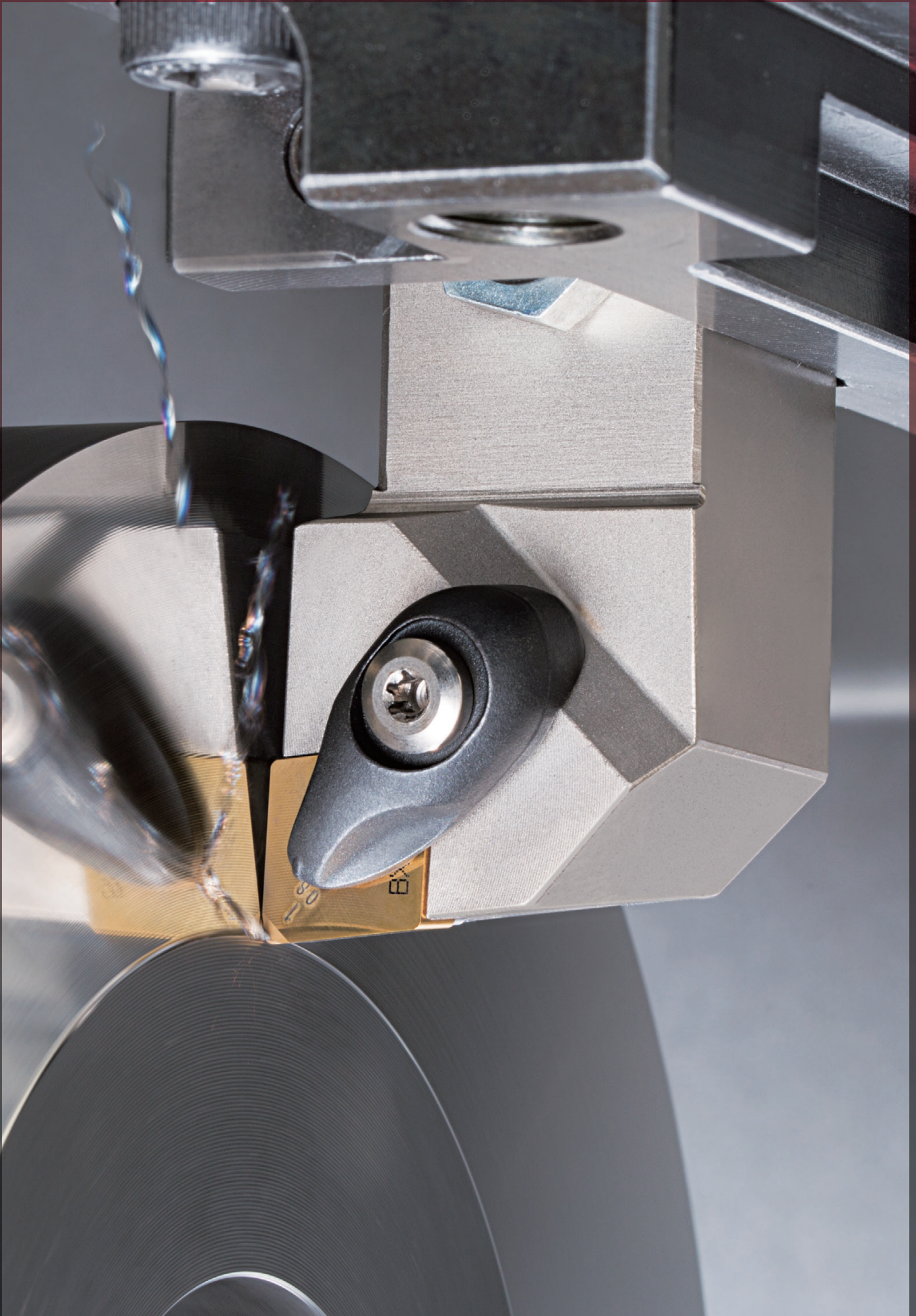
CBN insert

HARDBREAKER SERIES

Tungaloy Report No. 518-G

CBN inserts with integrated chipbreaker for improved hard turning productivity





INDUSTRY 4.0
FEED the SPEED!



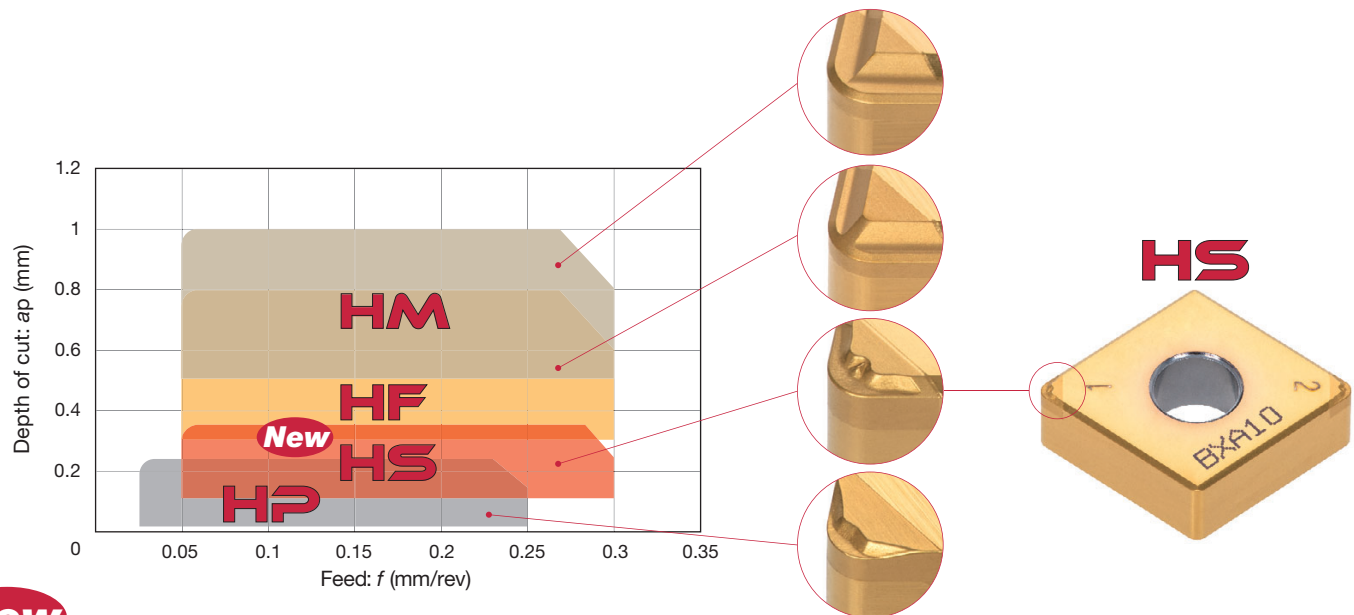
HARDBREAKER SERIES



Hardbreaker series now offering **HS chipbreaker**

HARDBREAKER SERIES

CBN inserts with chipbreaker
ideal for carburized layer removal and finishing hardened steel

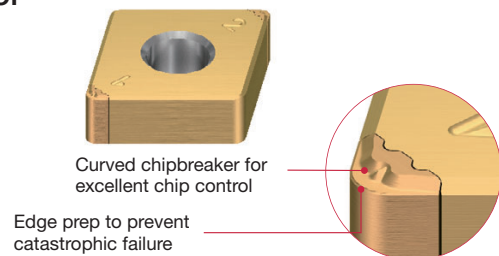


New

HS chipbreaker

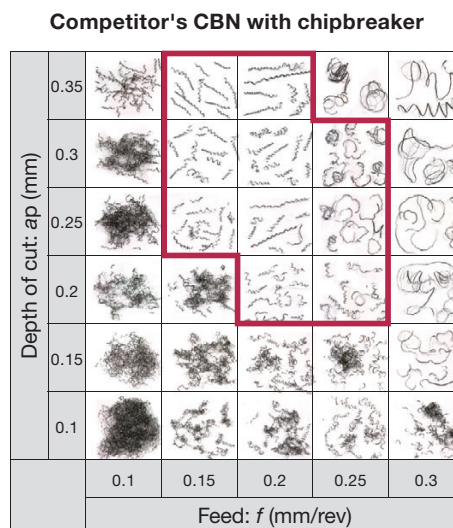
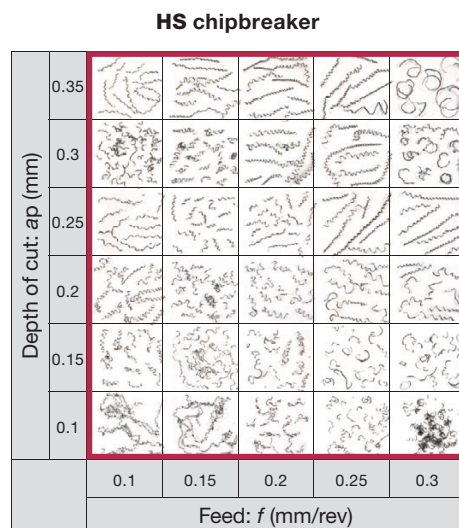
Optimized chipbreaker design for excellent chip control during hard turning at aggressive conditions

- Designed for high feed machining.
- Provides excellent chip control for a wide range of D.O.C. and feed rates.
- Edge preparation is designed to prevent catastrophic failure.



CUTTING PERFORMANCE

HS provides all-round chip breaking capability even at increased feed rates vs. competitors

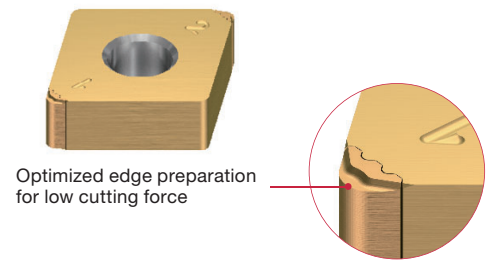


Insert : 2QP-CNGM120408-HS
 Workpiece material : SCM420 (58HRC)
 Cutting speed : $V_c = 150$ m/min
 Holder : ACLNL2525M12-A
 Coolant : Wet
 Machining : External continuous cutting

HP chipbreaker

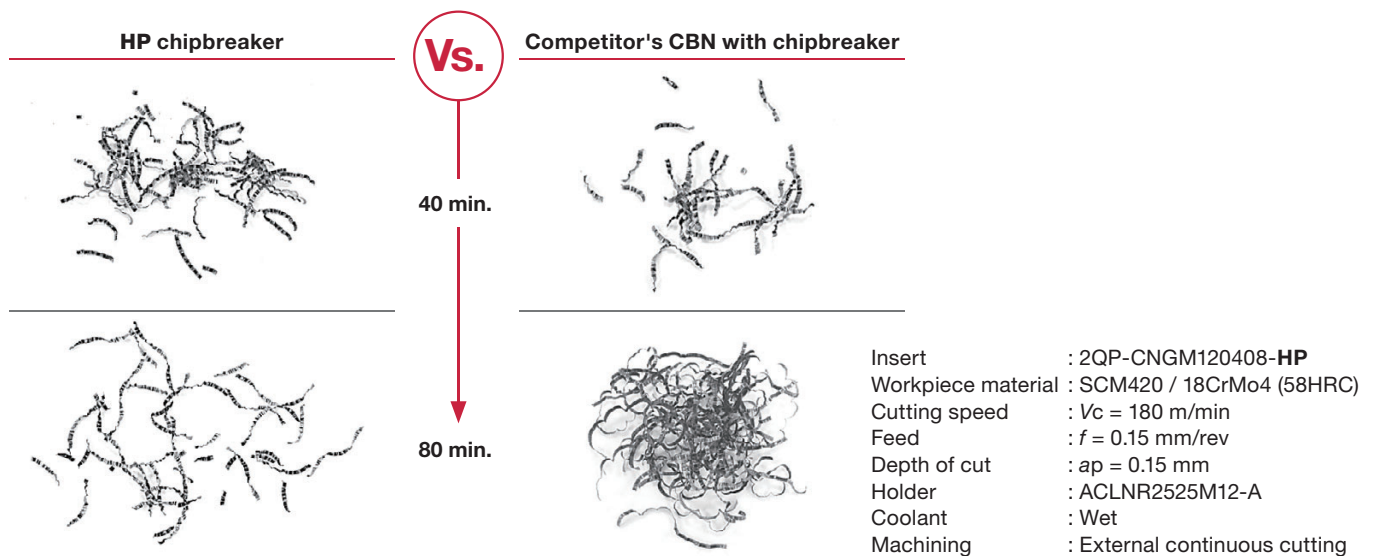
Designed for finish machining of hardened parts with close tolerances

- Optimized chipbreaker geometry significantly reduces cutting force imposed on the cutting edge, ensuring long tool life.
- The edge preparation is designed to generate low cutting force, providing chatter-free machining and close tolerances.
- The built-in wiper yields excellent surface quality and good chip control.



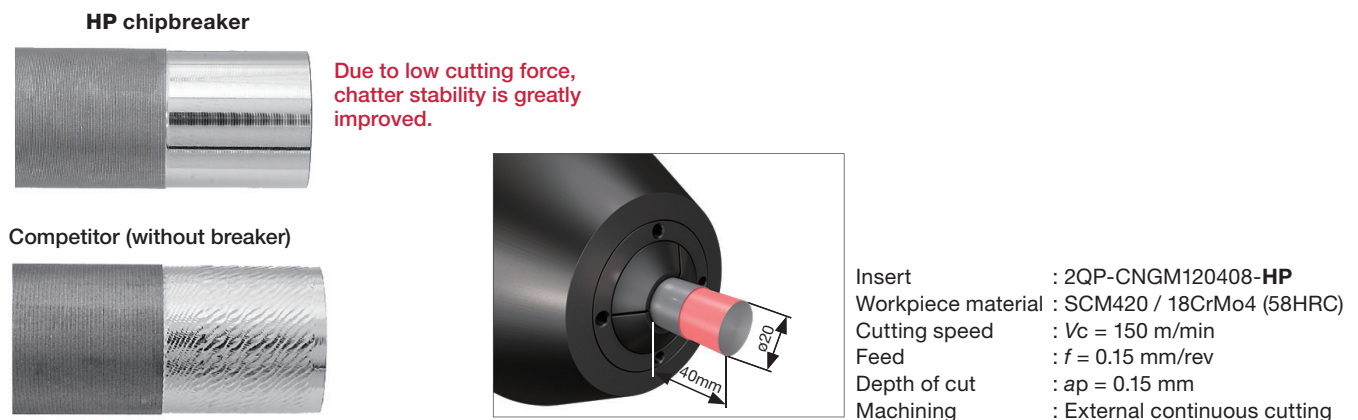
CUTTING PERFORMANCE

HP chipbreaker provides better chip control over the competitors



Chatter stability

→ Prevents chattering and provides the finest machined surface

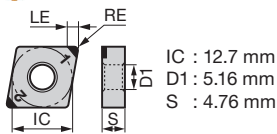


HF and HM chipbreakers

- Suited for hard turning applications requiring great D.O.C. such as carburized layer removal.
- Effective chip breaking is possible for a wide range of hard materials.
- **BXA20** and **BXM20** CBN grade inserts are available for aggressive cutting depths.



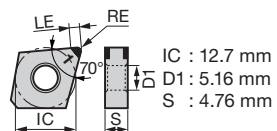
**Rhombic, 80°
with hole**

[illegible]

● : New product
● : Line up

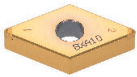


**G-shape, 70°
with hole**

[illegible]

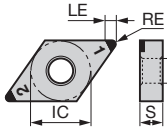
● : New product
● : Line up

With chipbreaker



DN 1504

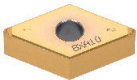
**Rhombic, 55°
with hole**



IC : 12.7 mm
D1 : 5.16 mm
S : 4.76 mm

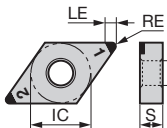
[illegible][illegible]

● : New product
● : Line up



DN 1506

**Rhombic, 55°
with hole**

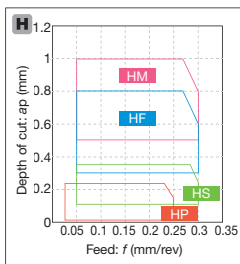


IC : 12.7 mm
D1 : 5.16 mm
S : 6.35 mm

[illegible][illegible]

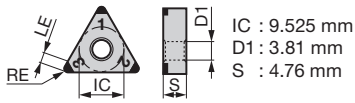
● : New product
● : Line up

Chip control range

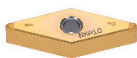




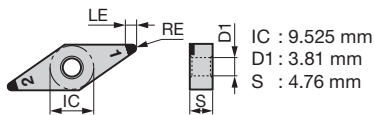
**Triangular, 60°
with hole**



● : New product
● : Line up



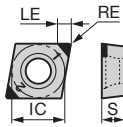
**Rhombic, 35°
with hole**



● : New product
● : Line up



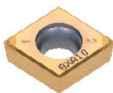
**Rhombic, 80°
with hole**



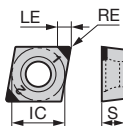
IC : 6.35 mm
D1 : 2.8 mm
S : 2.38 mm

[illegible]

● : New product
● : Line up



**Rhombic, 80°
with hole**

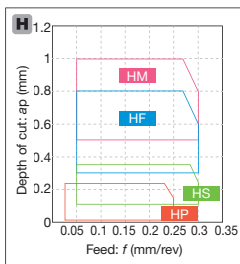


IC : 9.525 mm
D1 : 4.4 mm
S : 3.97 mm

[illegible]

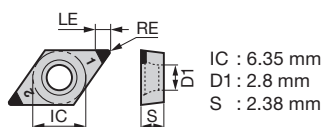
● : New product
● : Line up

Chip control range





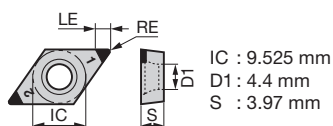
**Rhombic, 55°
with hole**



● : New product
● : Line up



**Rhombic, 55°
with hole**



● : New product
● : Line up



**Triangular, 60°
with hole**

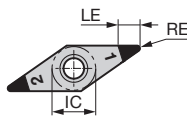


IC : 6.35 mm
D1 : 3.4 mm
S : 3.18 mm

● : New product
● : Line up



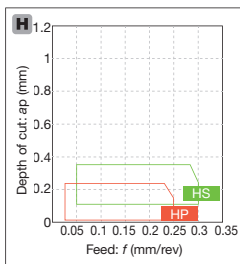
**Rhombic, 35°
with hole**



IC : 6.35 mm
D1 : 2.8 mm
S : 3.18 mm

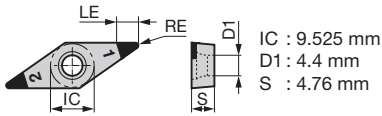
● : New product
● : Line up

Chip control range





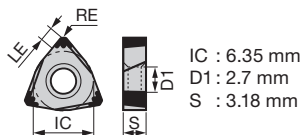
**Rhombic, 35°
with hole**



● : New product
● : Line up

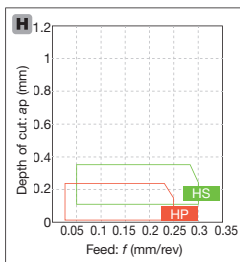


**Trigon, 80°
with hole**



● : Line up

Chip control range

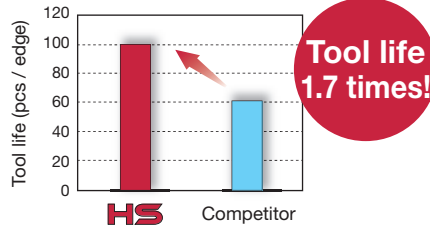
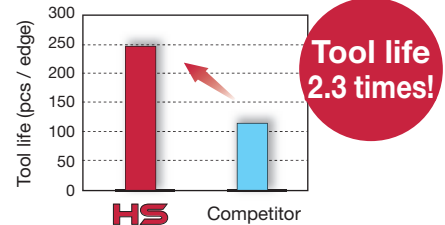
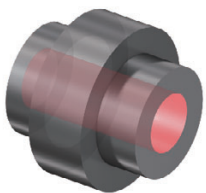
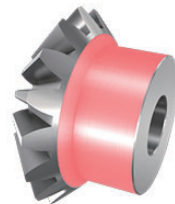
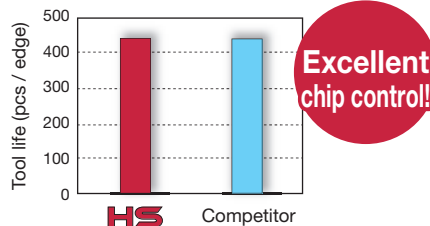
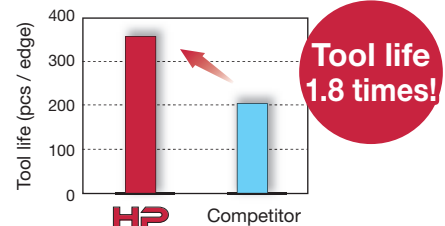


STANDARD CUTTING CONDITIONS

ISO	Chipbreaker	Grade	Work condition	Cutting speed Vc (m/min)	Depth of cut ap (mm)	Feed f (mm/rev)
H	HP	BXA10	Continuous	120 - 350	0.03 - 0.22	0.03 - 0.25
	HP	BXM10	Continuous	120 - 350	0.03 - 0.22	0.03 - 0.25
	HP	BXA20	Light interrupted	70 - 180	0.03 - 0.22	0.03 - 0.25
	HS	BXA10	Continuous	120 - 350	0.1 - 0.35	0.05 - 0.3
	HS	BXA20	Light interrupted	70 - 180	0.1 - 0.35	0.05 - 0.3
	HF	BXM20	Removing of carburized layer	70 - 180	0.3 - 0.8	0.05 - 0.3
	HM	BXA20	Removing of carburized layer	70 - 180	0.5 - 1	0.05 - 0.3
	HM	BXM20	Removing of carburized layer	70 - 180	0.5 - 1	0.05 - 0.3

HARDBREAKER SERIES

PRACTICAL EXAMPLES

Workpiece type		Road roller (heavy equipment)	Input shaft
Insert		3QP-TNGM160408-HS	2QP-CNGM120408-HS
Grade		BXA20	BXA10
Workpiece material		S45C / C45 (58HRC)	SCM420 / 18CrMo4 (58 - 60HRC)
		 H	 H
Cutting conditions	Cutting speed: V_c (m/min)	180	113 - 238
	Feed : f (mm/rev)	0.15	0.17
	Depth of cut : a_p (mm)	0.25	0.25
	Coolant	Wet	Wet
Results		 HS Competitor HS chipbreaker provided good chip control and eliminated chip re-cutting, improving surface quality.	 HS Competitor 1 out of 10 parts that were machined with the competitor's CBN chipbreaker resulted in chip bird-nesting. BXA10 grade insert with HS chipbreaker eliminated chip bird-nesting and, thanks to its good wear resistance, provided 2.3 times tool life increase.
Workpiece type		Auto part	Bevel gear
Insert		2QP-CCGT060204-HS	2QP-CNGM120408-HP
Grade		BXA20	BXA20
Workpiece material		SCM420 / 18CrMo4 (58HRC)	SCM420 / 18CrMo4 (58HRC)
		 H	 H
Cutting conditions	Cutting speed: V_c (m/min)	130	160
	Feed : f (mm/rev)	0.25	0.1
	Depth of cut : a_p (mm)	0.2	0.15
	Coolant	Wet	Wet
Results		 HS Competitor Out of 100 parts, 1 - 2 that were machined with the competitor's CBN chipbreaker insert resulted in chip bird-nesting. BXA20 with HS chipbreaker eliminated chip bird-nesting.	 HP Competitor The competitor's CBN insert had a short tool life because of chip re-cutting. HP chipbreaker insert eliminated chip bird-nesting, while also providing long tool life and excellent surface finish quality.

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