

CBN insert

HARDBREAKER SERIES

Tungaloy Report No. 518S4-US

New HF chipbreaker for optimal removal of carburized layer



HARDBREAKER SERIES

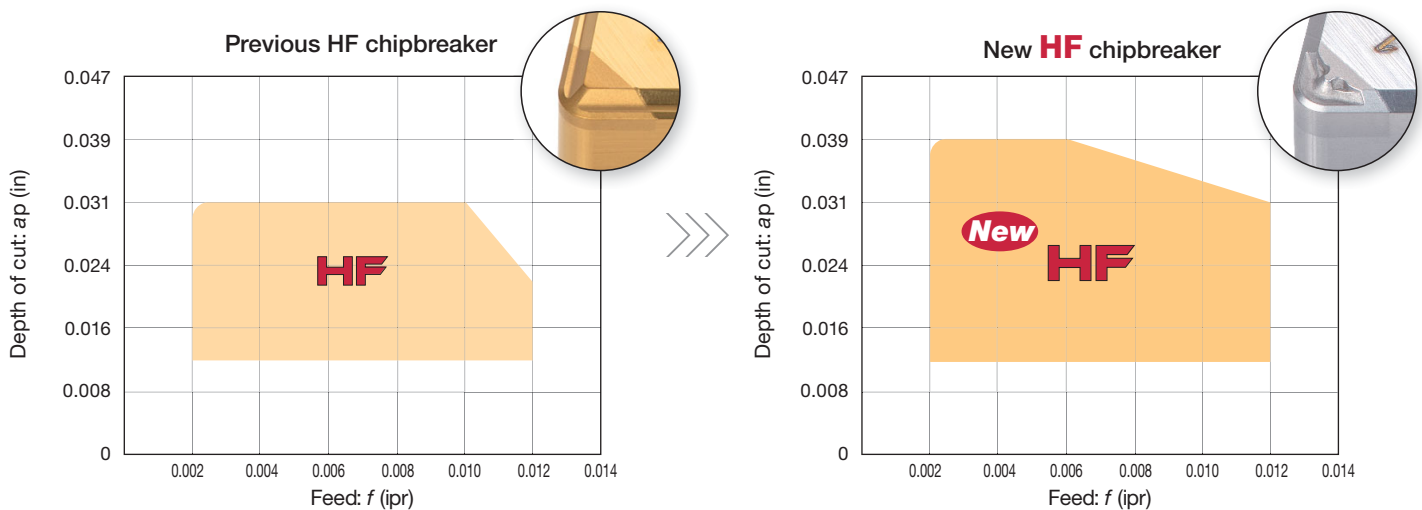


For more information

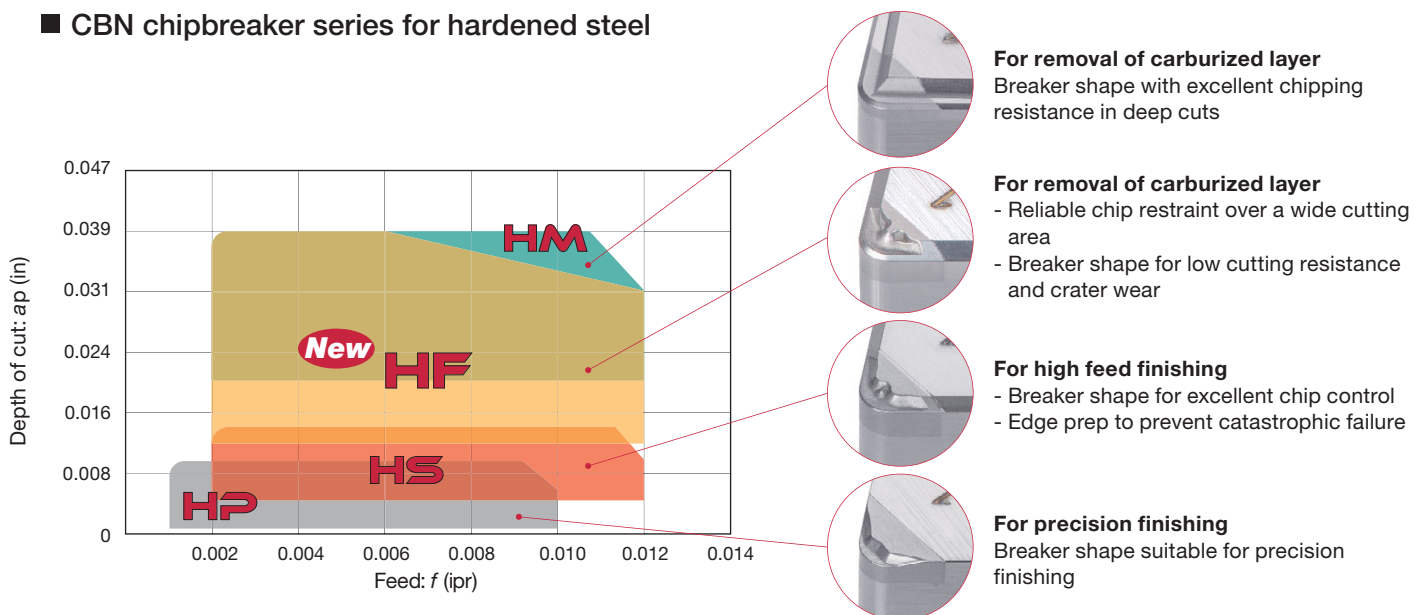
New HF chipbreaker for optimal removal of carburized layer

Application areas

New 3D chipbreaker expanded application coverage



CBN chipbreaker series for hardened steel



CUTTING PERFORMANCE (EXAMPLES OF ACTUAL PROCESSING)

■ Chip control

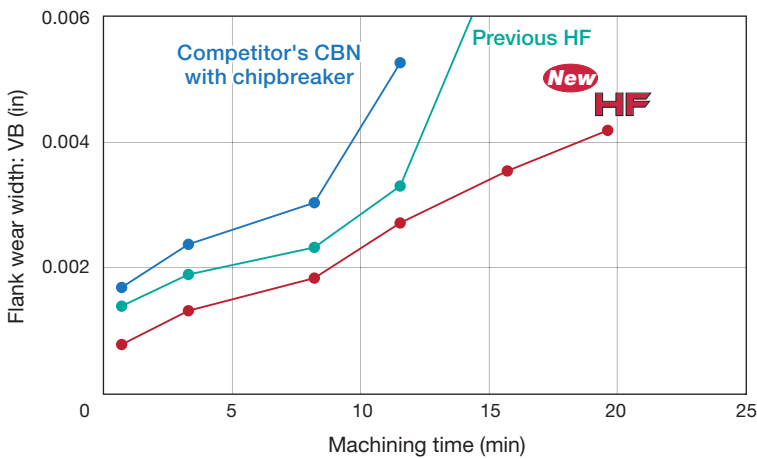
Comparisons of chip formations after machining 80 pcs of automotive shafts



Insert : 2QP-CNGM 432 HF
 Workpiece material: 4140 (60HRC)
 Cutting speed : $V_c = 591$ sfm
 Feed : $f = 0.008$ ipr
 Depth of cut : $a_p = 0.020'' \times 3$ passes
 Holder : ACLNL25252M12-A
 Machining : External continuous cutting
 Coolant : Wet

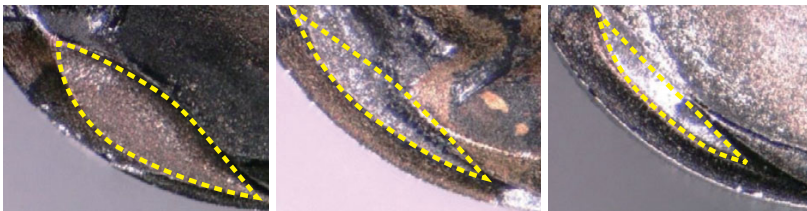
■ Crater wear resistance

Comparison of automotive clutch machining lifetime



Insert : 2QP-CNGM 432 HF
 Workpiece material: 4140 (60HRC)
 Cutting speed : $V_c = 492$ sfm
 Feed : $f = 0.006$ ipr
 Depth of cut : $a_p = 0.020'' \times 5$ passes
 Holder : ACLNL2525M12-A
 Machining : External continuous cutting
 Coolant : Wet



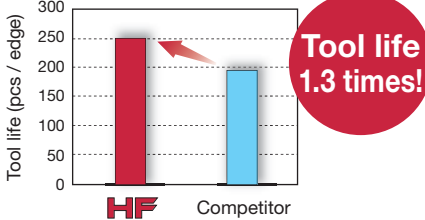
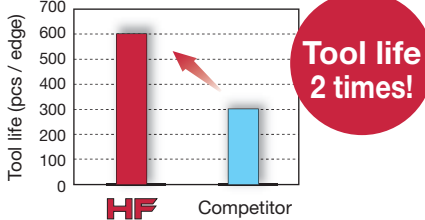

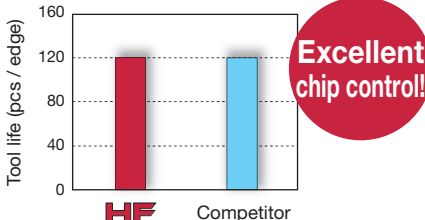
Comparisons of crater wear sizes (After 8 min)



Competitor's chipbreaker Previous HF chipbreaker New **HF** chipbreaker

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■ PRACTICAL EXAMPLES

Workpiece type		Automotive part	Automotive part (shaft)
Insert		2QP-CNGM 432 HF	4QS-CNGG 432 HF
Grade		BXA20	BXA20
		4140 (40 - 55HRC)	4140 (40 - 55HRC)
Workpiece material		 H	 H
Cutting conditions	Cutting speed: V_c (sfm)	427	459
	Feed : f (ipr)	0.009	0.009
	Depth of cut : a_p (in)	0.020" x 2 passes	0.012" x 3 passes
	Coolant	Wet	Wet
Results		 <p>HF Competitor</p> <p>HF chipbreaker reduced crater wear, while providing 1.3 times tool life increase.</p>	 <p>HF Competitor</p> <p>The competitor's insert could not control chips from the beginning and ended up with short tool life. HF chipbreaker provided reliable chip forming and double tool life.</p>
Workpiece type		Automotive parts (shaft)	
Insert		2QP-CNGM 432HF	
Grade		BXA20	
		4140 (40 - 54HRC)	
Workpiece material		 H	
Cutting conditions	Cutting speed: V_c (sfm)	525 - 591	
	Feed : f (ipr)	0.008	
	Depth of cut : a_p (in)	0.016" - 0.020" x 3 passes	
	Coolant	Wet	
Results		 <p>HF Competitor</p> <p>Birdnesting occurred when using the competitor's CBN with chipbreaker. HF chipbreaker has eliminated birdnesting.</p>	

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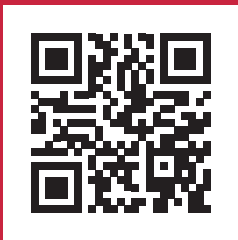
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