

TURNLINE Inserts for Super Alloy Turning

HMM & AH905

PREMIUMTEC
TUNGALOY

Maximize productivity in machining Super Alloy !



Features

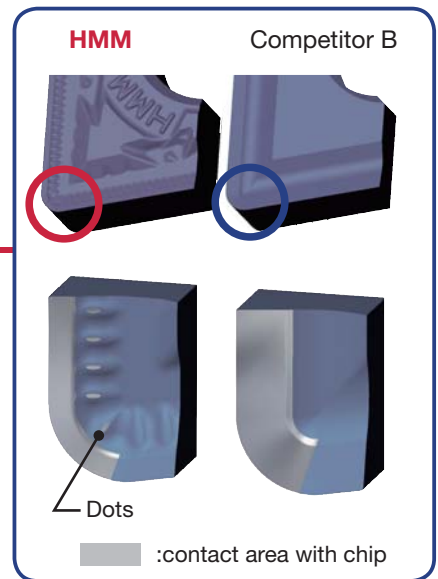
Chipbreaker for improved machining

Special designed 3-D chipbreaker for super alloys



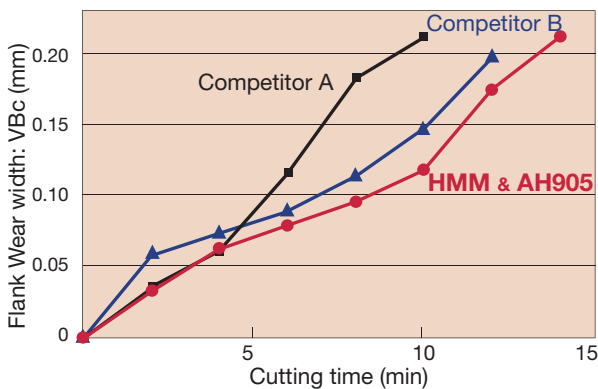
Low cutting force

- Reducing the cutting force by the narrow land and dots on rake face for low friction. (See the figure on right)



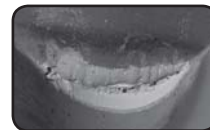
Cutting performance

Excellent tool life



Cutting time

Competitor A



After 10 minutes

Competitor B



After 12 minutes

HMM & AH905

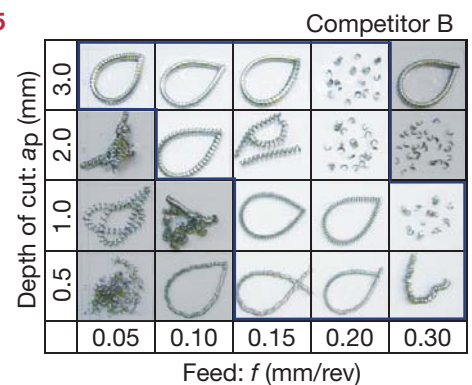
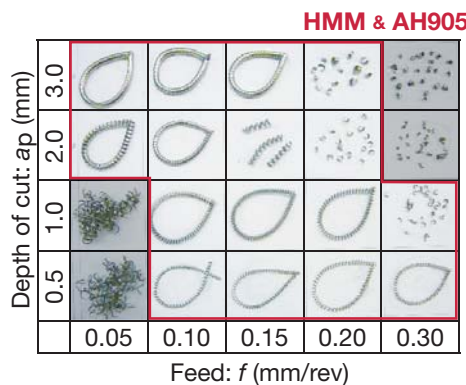


After 14 minutes

Work material : Inconel 718-T6 (40 ~ 44 HRC)
 Insert : CNMG120408-**
 Toolholder : ACLNL2525M12-A
 Cutting speed : $V_c = 56$ m/min
 Depth of cut : $a_p = 0.7$ mm
 Feed : $f = 0.2$ mm/rev

Stable chip control in wide range of condition

Work material : Inconel 718-T6 (40 ~ 44 HRC)
 Insert : CNMG120408-**
 Toolholder : ACLNL2525M12-A
 Cutting Speed: $V_c = 56$ m/min



Standard cutting condition

Work material	Chipbreaker	Grade	Cutting speed V_c (m/min)	Depth of cut a_p (mm)	Feed f (mm/rev)
Ni-base Alloys (Inconel 718 etc)	HMM	AH905	50 (20 - 100)	0.5 - 1.5 - 3.0	0.1 - 0.2 - 0.3

Grade

AH905 AH905 New PVD coated grade

Long tool life

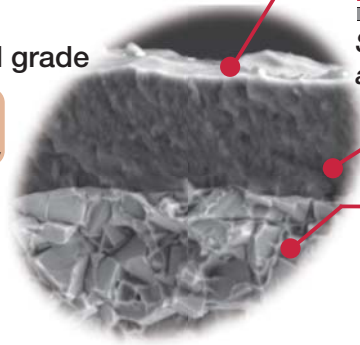


Specified grade for Super Alloy turning

New (Al, Ti)N layer has high oxidation resistance. This shows excellent wear resistance for super alloy.

Special Surface Technology
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Smooth insert surface prevents chip adhesion and improves chip flow



New (Al,Ti)N coating

Fine grain cemented carbide

Provides high impact resistance

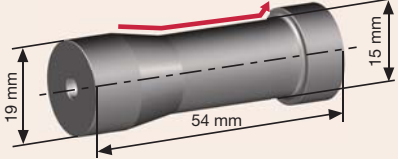
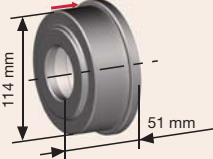
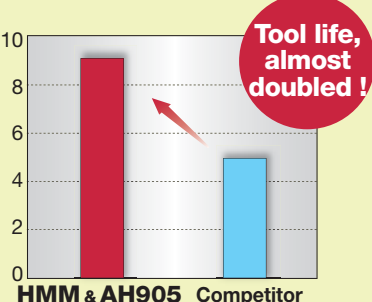
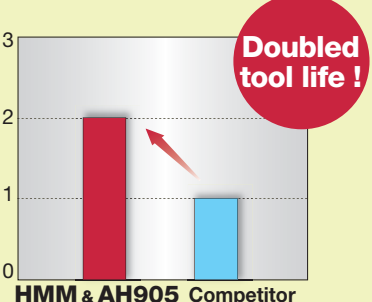
Application	Grade	Substrate			Coating layer		Features
	ISO application code	Specific gravity	Hardness (HRA)	T.R.S. (GPa)	Main composition	Thickness (µm)	
	AH905	15	93.0	2.9	(Al,Ti)N	1.5	For turning super alloy Excellent cutting edge strength and wear resistance
	S05 - S15						

Inserts

Application	Chipbreaker	$f - ap$	Insert Cat. No. (Metric)	Dimensions (mm)				Grade
	Appearance (Cross section)			I.C. dia ϕd	Thick-ness S	Hole dia ϕd_1	Corner R $r\epsilon$	Coated AH905
For Super alloys	HMM		CNMG120404-HMM	12.7	4.76	5.16	0.4	●
	* CNMG120408-HMM		0.8				●	
	CNMG120412-HMM		1.2				●	
	CNMG160608-HMM		15.875	6.35	6.35	0.8	●	
	CNMG160612-HMM					1.2	●	
	CNMG160616-HMM					1.6	●	
	DNMG150404-HMM		12.7	4.76	5.16	0.4	●	
	* DNMG150408-HMM					0.8	●	
	DNMG150412-HMM					1.2	●	
	* SNMG120408-HMM		12.7	4.76	5.16	0.8	●	
	SNMG120412-HMM					1.2	●	
	TNMG160404-HMM		9.525	4.76	3.81	0.4	●	
	* TNMG160408-HMM					0.8	●	
	TNMG160412-HMM					1.2	●	
	WNMG080404-HMM		12.7	4.76	5.16	0.4	●	
	* WNMG080408-HMM					0.8	●	
	WNMG080412-HMM					1.2	●	
	VNMG160404-HMM		9.525	4.76	3.81	0.4	●	
	* VNMG160408-HMM					0.8	●	
	VNMG160412-HMM					1.2	●	

Note: Cross section of chipbreaker is of * marked inserts.

Practical Examples

Work piece type		Nozzle	Engine component
Insert		DNMG150408-HMM AH905	CNMG120408-HMM AH905
Work material		Hastelloy X	Inconel 718
Cutting conditions			
Cutting conditions	Cutting speed: V_c (m/min)	100	45
	Feed : f (mm/rev)	0.13	0.25
	Depth of cut : a_p (mm)	2.0	1.0
	Coolant	Water soluble	Water soluble
Results		 <p>Machining is very stable and tool life was extended.</p>	 <p>Even with 150% higher feed, cutting edge has no chipping, and tool life is very stable.</p>



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