

TurnLine

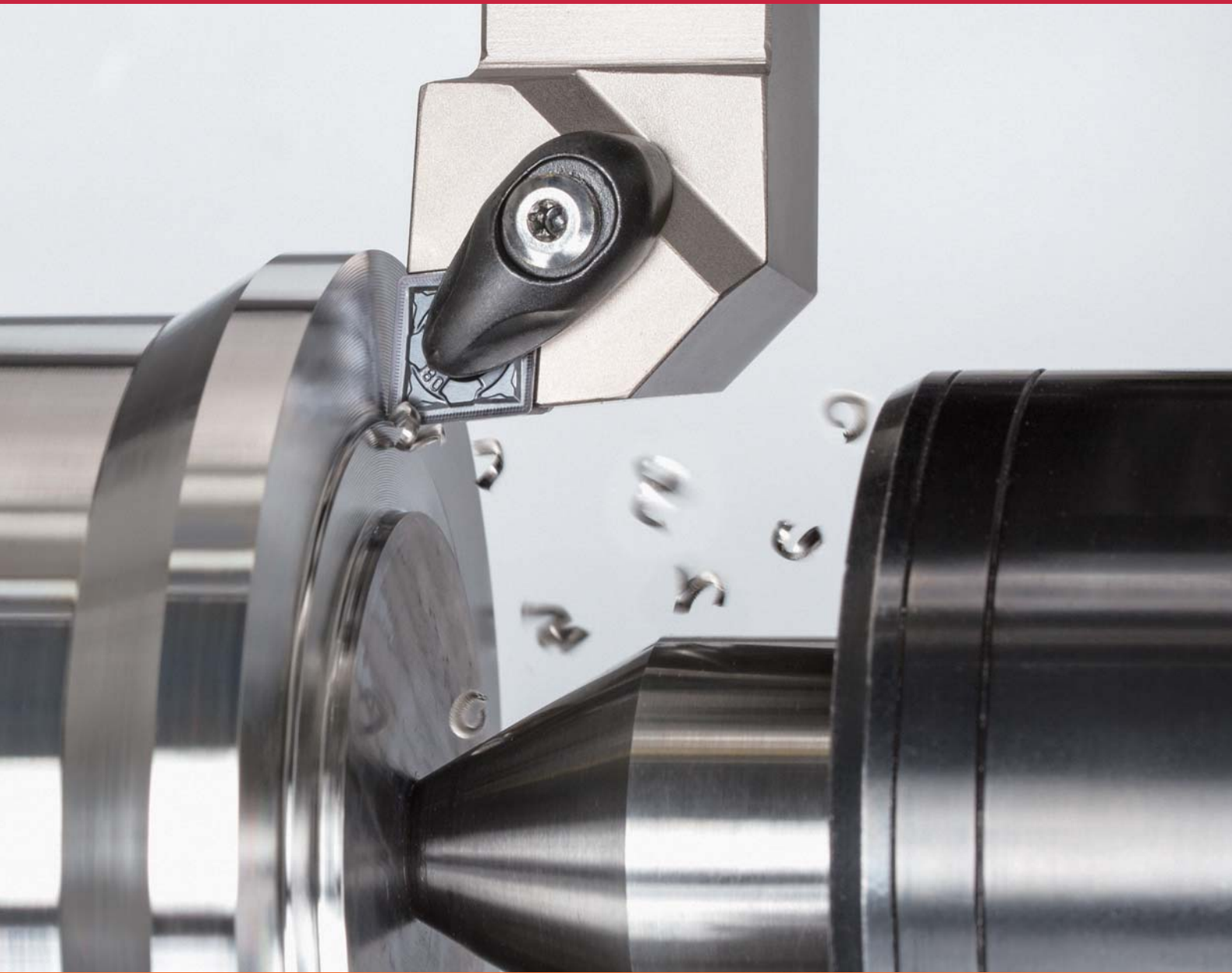


# AH8000 SERIES

[www.tungaloy.com](http://www.tungaloy.com)

Tungaloy Report No. 437-G

Now in **positive geometry with new chipbreakers** to conquer ISO S materials



**INDUSTRY 4.0**  
*FEED the SPEED!*

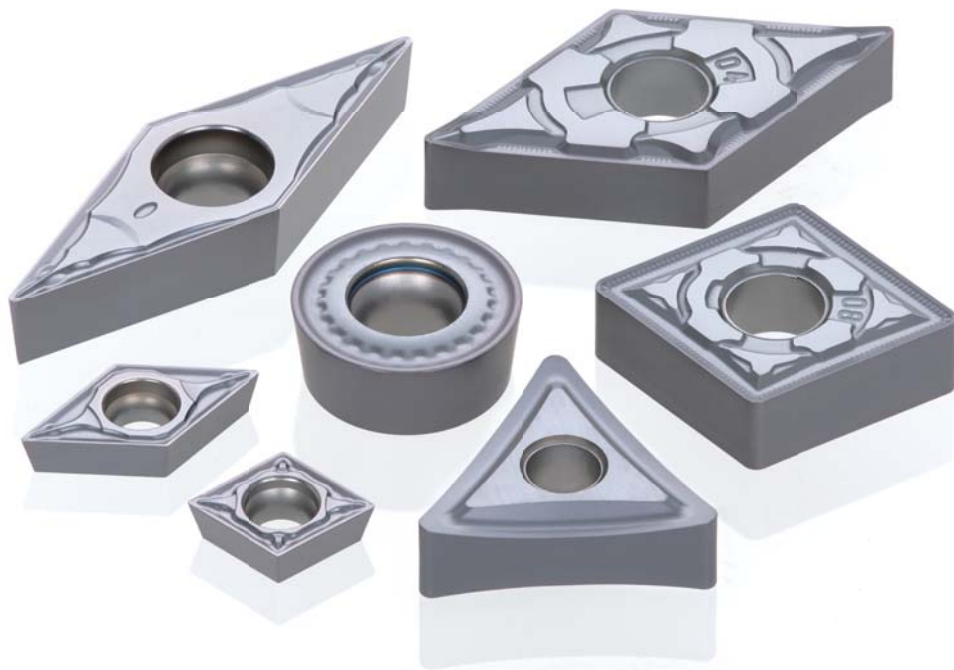


ACCELERATED MACHINING

TurnLine

# AH8000 SERIES

TUNGALOY



Expanded insert lineup including enhanced positive and negative inserts with low cutting force edge prep featuring the -28 style chipbreaker.

## Incredible reliability in turning of heat-resistant alloys

### PREMIUMTEC

TUNGALOY

Special surface technology

Nano-multi-layered AlTiN coating with high Al content

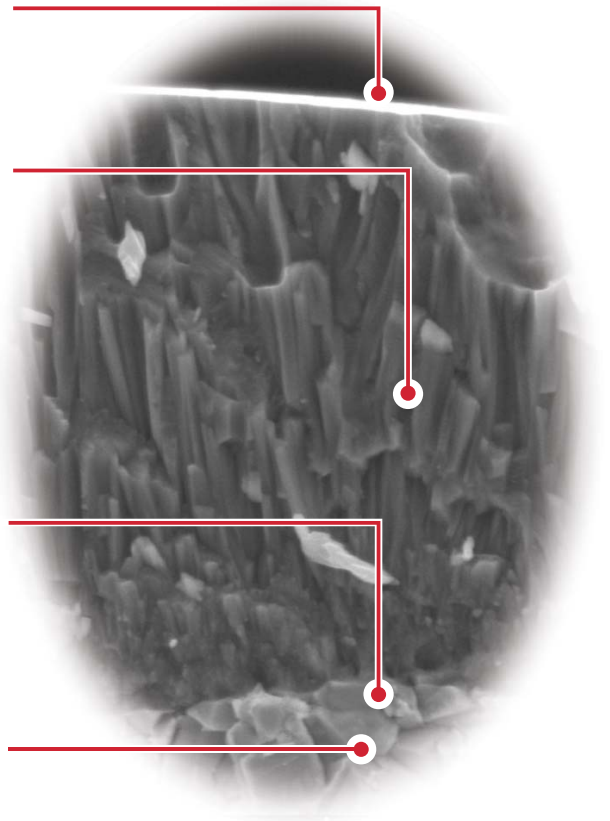
- Increases hardness by 20%
- Prevents micro cracks from developing

→ Long tool life & stable machining

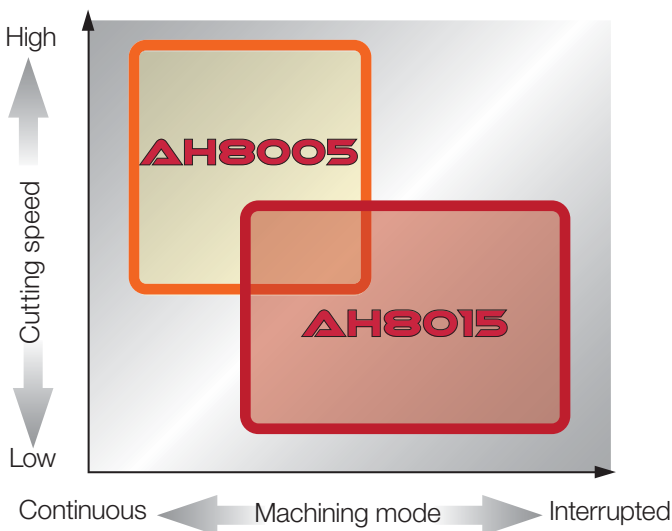
Improved adhesion strength

→ Prevents notch wear that tends to occur in machining heat-resistant alloys

Newly developed substrates



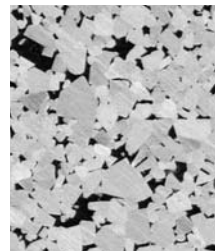
### APPLICATION AREA



#### AH8015

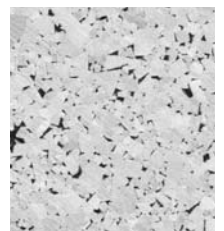
The 1st recommendation for heat-resistant alloys

Versatile grade with high wear and fracture resistance



#### AH8005

Grade with high hardness and excellent wear resistance

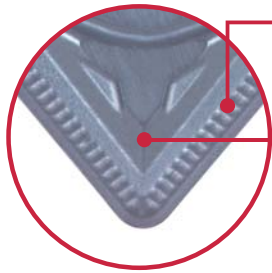




## CHIPBREAKERS

### HRM For finishing to medium cutting

#### The 1st recommendation



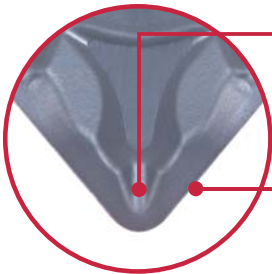
Unique protrusions on the rake face

Reduce the contact area of rake face and chips

Optimized rake face geometry and protrusion

Provide low cutting force and stable chip control

### HRF For finishing



Special protrusion

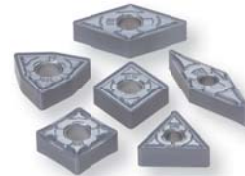
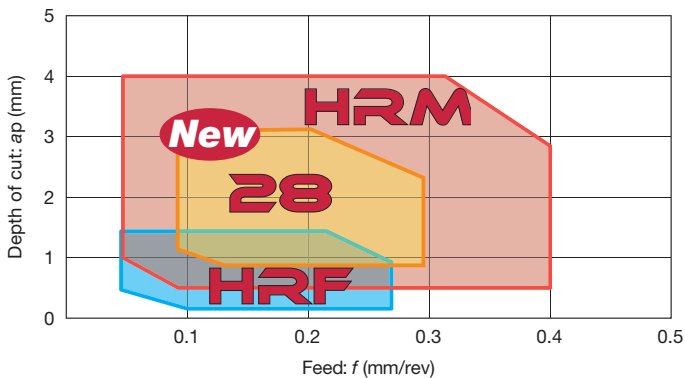
Provides excellent chip control in machining depth of cut less than the corner R

Large rake angle and inclination

Reduce cutting force

## APPLICATION AREA AND CHIP CONTROL

### Chipbreakers for negative inserts



- The -HRF and -HRM styles are added as the first choice chipbreakers to the standard lineup, along with the free-cutting -28 chipbreaker to complement the negative insert range.

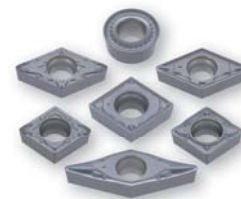
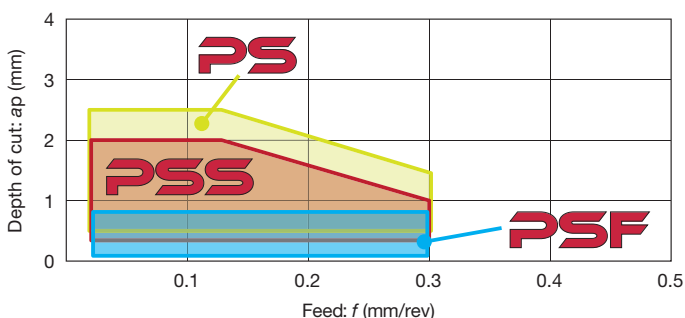
- Suited for medium to finish cutting range.

\* For D.O.C > 4 mm, use inserts in >12.7mm I.C.

**New**

### Main chipbreakers for positive inserts

(CCMT, CPMT, DCMT, VBMT, VCMT)



- PSF, PSS, and PS chipbreakers cover finishing to medium cutting.

- Complementary chipbreaker: All-round type

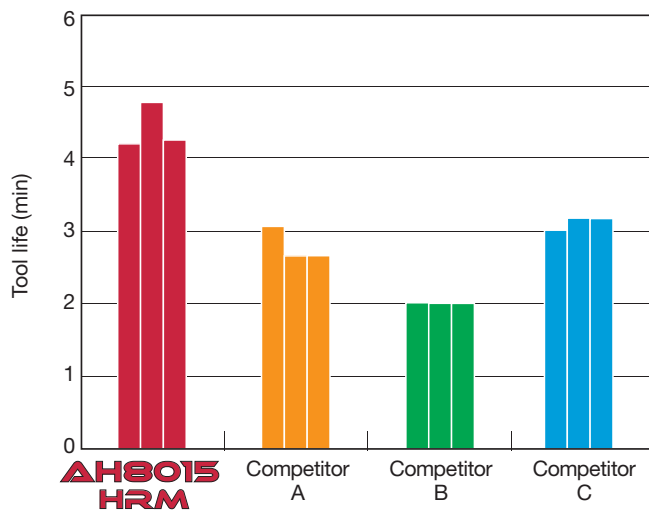
## CUTTING PERFORMANCE

### AH8015 / HRM

- General machining condition

Insert : CNMG120408-\*\*  
 Cutting speed :  $V_c = 60$  m/min  
 Feed :  $f = 0.2$  mm/rev  
 Depth of cut :  $a_p = 1.0$  mm  
 Machining : External turning  
 Coolant : Wet

#### S Inconel 718



After 4 min.



AH8015 / HRM

After 2 min.



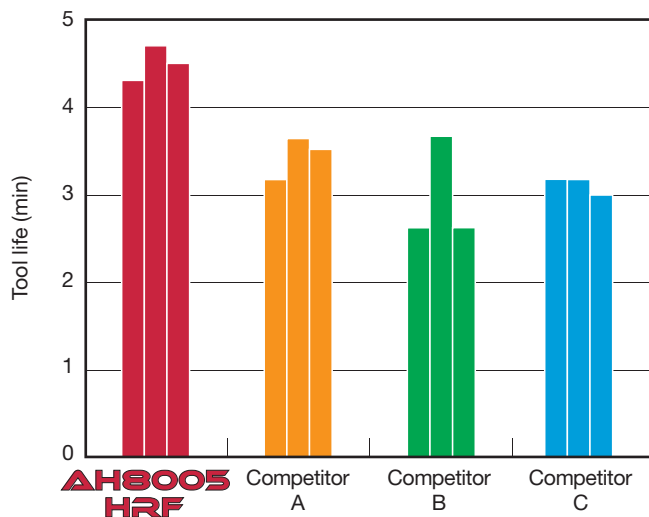
Competitor B

### AH8005 / HRF

- High-speed cutting

Insert : CNMG120408-\*\*  
 Cutting speed :  $V_c = 100$  m/min  
 Feed :  $f = 0.15$  mm/rev  
 Depth of cut :  $a_p = 0.3$  mm  
 Machining : External turning  
 Coolant : Wet

#### S Inconel 718



After 2.7 min.



AH8005 / HRF

After 2.7 min.



Competitor B

## GRADES

Application	Grade Application code	Substrate			Coating layer	
		Specific gravity	Hardness (HRA)	T.R.S. (GPa)	Main composition	Thickness (µm)
<b>S</b>	<b>AH8005</b>	15.0	93.0	2.2	(Al,Ti)N	3.5
	S01 - S10					
	<b>AH8015</b>	14.9	91.8	3.1	(Al,Ti)N	3.5
	S10 - S20					

## STANDARD CUTTING CONDITIONS

### Chipbreakers for negative inserts

Chipbreaker	Corner radius RE	Depth of cut ap (mm)	Feed f (mm/rev)	Cutting speed: Vc (m/min)	
				AH8005	AH8015
HRF	0.4	0.2 - 1.5	0.05 - 0.23	40 - 100	20 - 80
	0.8	0.2 - 1.5	0.05 - 0.25	40 - 100	20 - 80
	1.2	0.2 - 1.5	0.07 - 0.27	40 - 100	20 - 80
HRM	0.4	0.5 - 4.0	0.05 - 0.30	40 - 100	20 - 80
	0.8	0.5 - 4.0	0.07 - 0.33	40 - 100	20 - 80
	1.2	0.5 - 4.0	0.10 - 0.35	40 - 100	20 - 80
	1.6	0.5 - 4.0	0.15 - 0.40	40 - 100	20 - 80
<b>New</b> 28	0.4	0.5 - 3.0	0.08 - 0.20	40 - 100	20 - 80
	0.8	0.5 - 3.0	0.10 - 0.30	40 - 100	20 - 80
	1.2	0.5 - 3.0	0.10 - 0.30	40 - 100	20 - 80

\* Values for the inserts with 12.7 mm I.C. dia.

**New**

### Chipbreakers for positive inserts

Chipbreaker	Corner radius RE	Depth of cut ap (mm)	Feed f (mm/rev)	Cutting speed: Vc (m/min)	
				AH8005	AH8015
PSF	0.4	0.05 - 0.5	0.02 - 0.20	40 - 100	20 - 80
	0.8	0.05 - 0.5	0.02 - 0.30	40 - 100	20 - 80
PSS	0.4	0.3 - 2.0	0.02 - 0.20	40 - 100	20 - 80
	0.8	0.3 - 2.0	0.03 - 0.30	40 - 100	20 - 80
	1.2	0.3 - 2.0	0.05 - 0.30	40 - 100	20 - 80
PS	0.4	0.5 - 2.5	0.02 - 0.20	40 - 100	20 - 80
	0.8	0.5 - 2.5	0.03 - 0.30	40 - 100	20 - 80
	1.2	0.5 - 2.5	0.05 - 0.30	40 - 100	20 - 80
All-round	0.4	0.5 - 3.0	0.08 - 0.20	40 - 100	20 - 80
	0.8	0.5 - 3.0	0.08 - 0.30	40 - 100	20 - 80
	1.2	0.5 - 3.0	0.08 - 0.30	40 - 100	20 - 80
RS		0.5 - 1.5	0.03 - 0.30	40 - 100	20 - 80
61		0.5 - 2.0	0.20 - 0.60	40 - 100	20 - 80

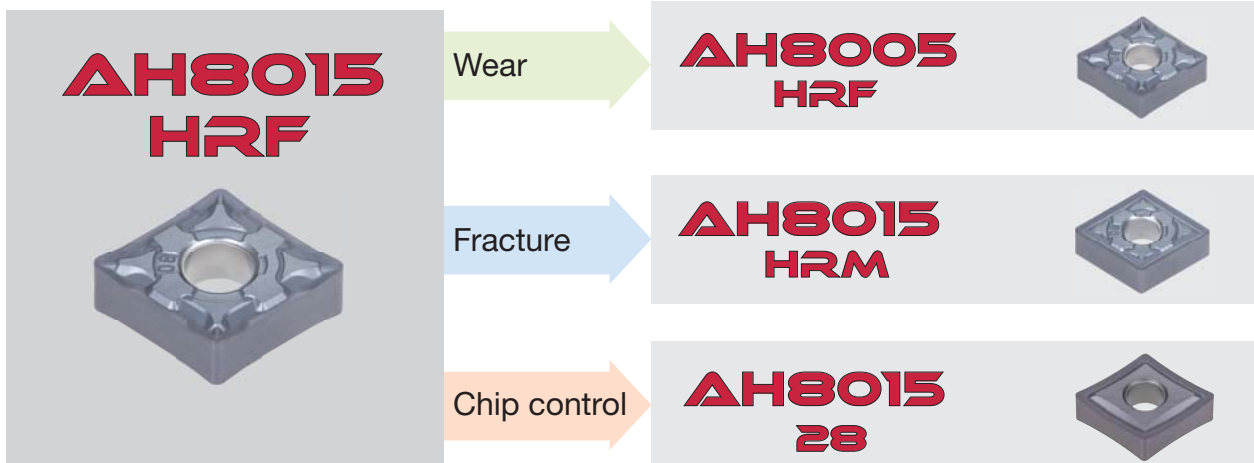
\* Values for the inserts with 9.525 mm I.C. dia.

## SELECTION GUIDE

### Chipbreakers for negative inserts

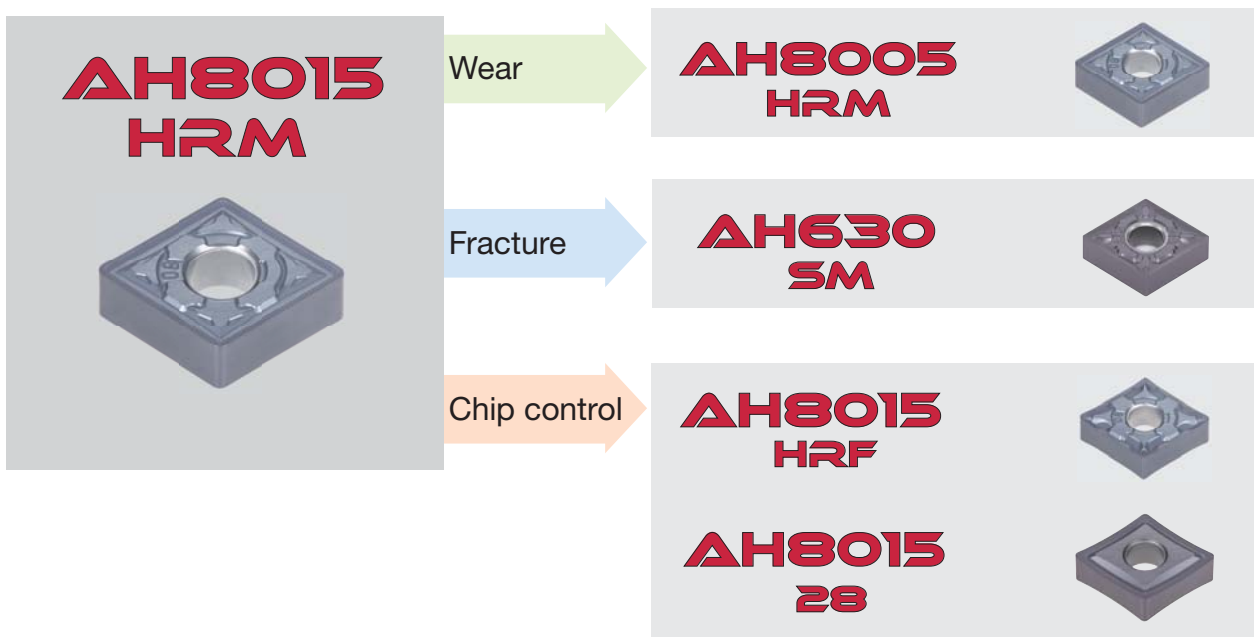
- For finishing ( $a_p = 0.2 - 1.5 \text{ mm}$ )

*The 1st recommendation*



- For finishing to medium cutting ( $a_p = 0.5 - 4.0 \text{ mm}$ )

*The 1st recommendation*



Note: This is a general guide and may not be applicable under the specific conditions.

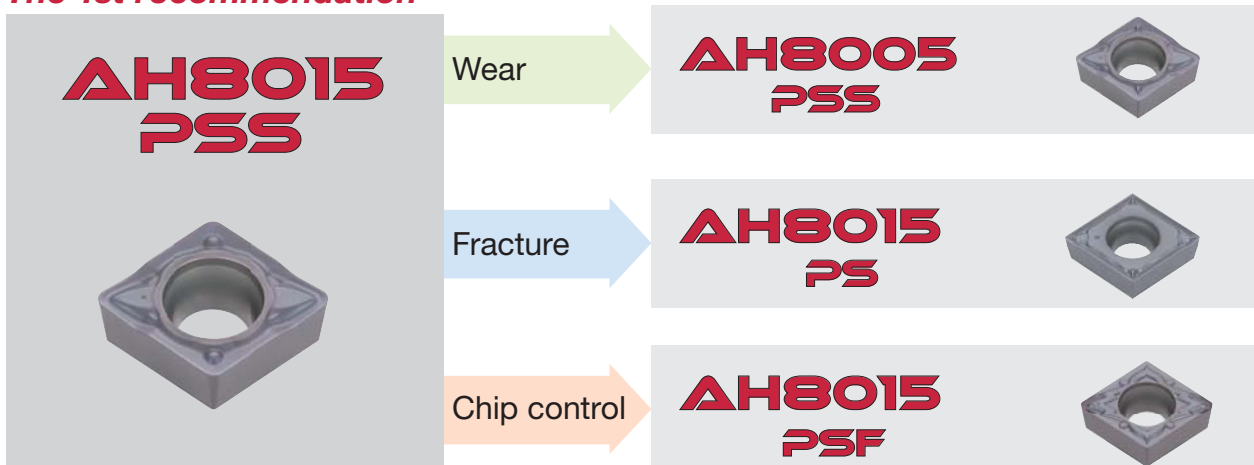


**New**

## Chipbreakers for positive inserts

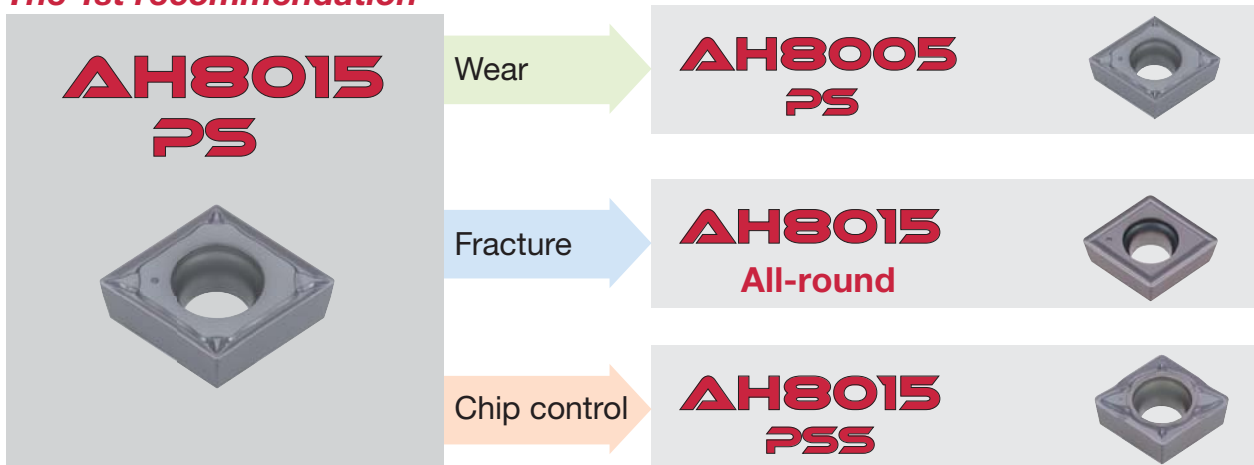
- For finishing ( $a_p = 0.3 - 2.0$  mm)

### The 1st recommendation



- For finishing to medium cutting ( $a_p = 0.5 - 2.5$  mm)

### The 1st recommendation



Note: This is a general guide and may not be applicable under the specific conditions.



















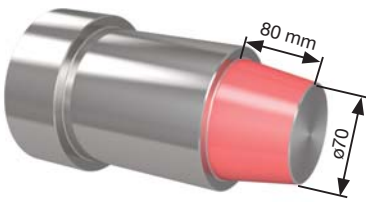
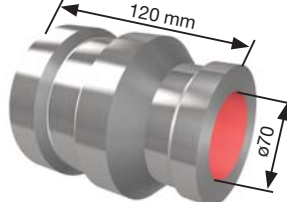
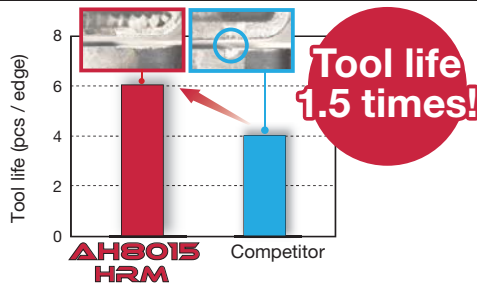
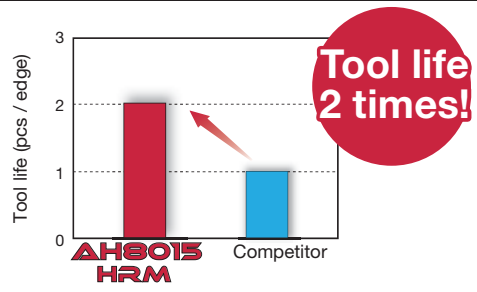
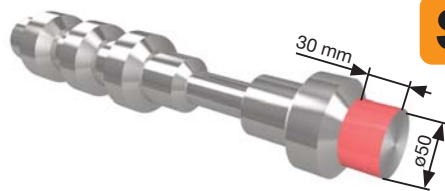
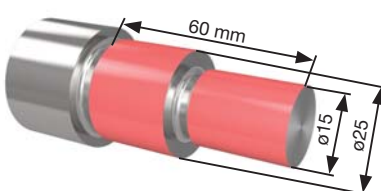
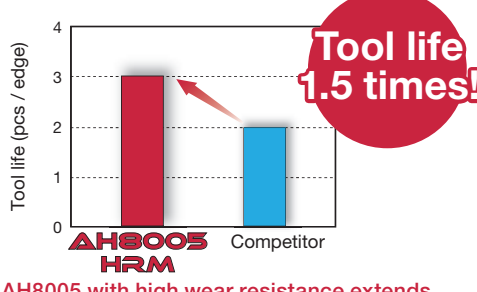
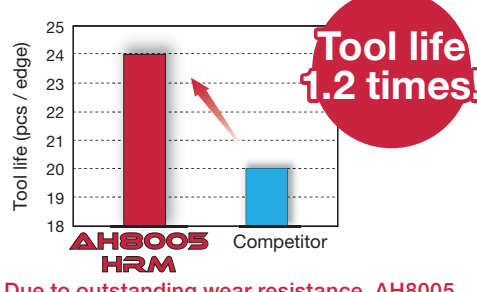






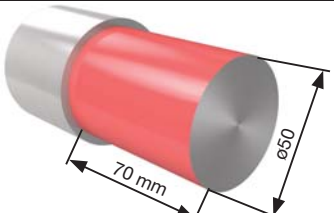
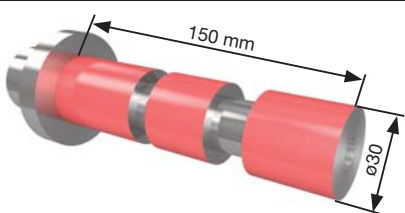
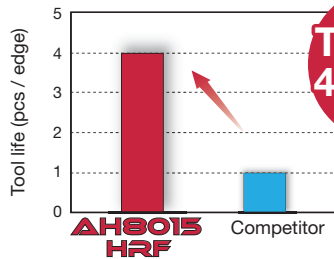
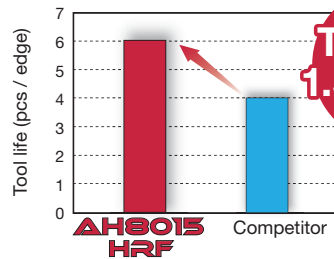
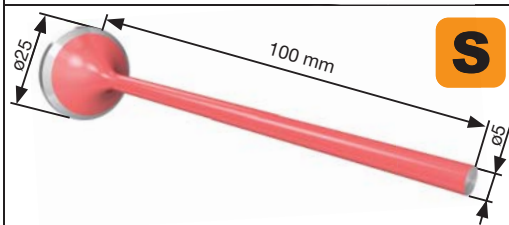
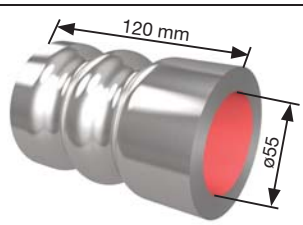
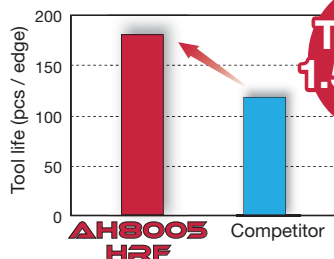
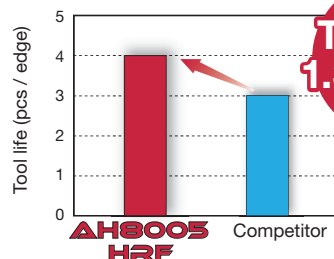


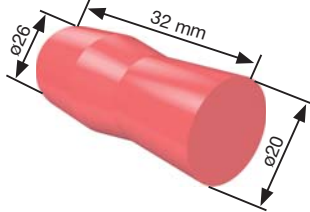
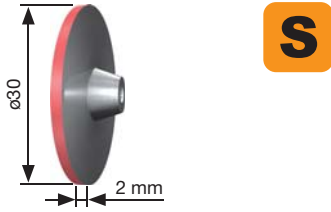
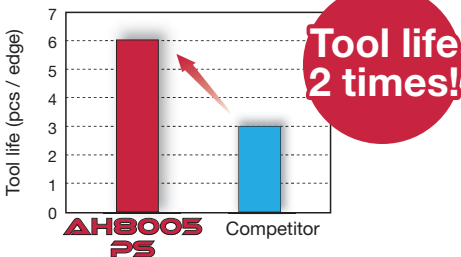
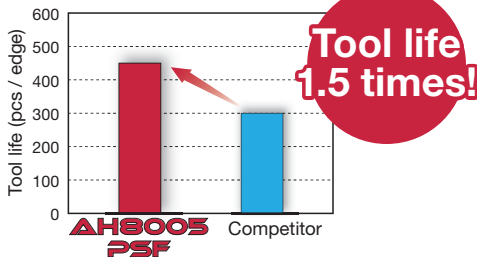
## PRACTICAL EXAMPLES

Workpiece type	Valve parts	Aircraft parts	
Insert	CNMG120408-HRM	CNMG120408-HRM	
Grade	AH8015	AH8015	
Workpiece material	Inconel 625	Inconel 718	
			
Cutting conditions	Cutting speed: $V_c$ (m/min)	30	40
	Feed : $f$ (mm/rev)	0.2	0.22
	Depth of cut : $a_p$ (mm)	1.5	2.0
	Coolant	Wet	Wet
Results	 <p><b>AH8015 HRM</b> Competitor</p> <p>AH8015 with HRM chipbreaker greatly reduces notch wear and extends tool life by 1.5 times.</p>	 <p><b>AH8015 HRM</b> Competitor</p> <p>AH8015 that is well-balanced between wear and fracture resistance doubles tool life.</p>	
Workpiece type	Shaft parts	Valve parts	
Insert	CNMG120408-HRM	CNMG120408-HRM	
Grade	AH8005	AH8005	
Workpiece material	Inconel 718	Inconel 718	
			
Cutting conditions	Cutting speed: $V_c$ (m/min)	50	80
	Feed : $f$ (mm/rev)	0.28	0.20
	Depth of cut : $a_p$ (mm)	3.5	1.0 - 1.5
	Coolant	Wet	Wet
Results	 <p><b>AH8005 HRM</b> Competitor</p> <p>AH8005 with high wear resistance extends tool life by 1.5 times.</p>	 <p><b>AH8005 HRM</b> Competitor</p> <p>Due to outstanding wear resistance, AH8005 extends tool life by 1.2 times.</p>	

# AH8000 SERIES

TUNGALOY

Workpiece type	Tube parts	Aircraft parts	
Insert	CNMG120408-HRF	CNMG120412-HRF	
Grade	AH8015	AH8015	
Workpiece material	Hastelloy 276	Inconel 909	
			
Cutting conditions	Cutting speed: $V_c$ (m/min)	80	55
	Feed : $f$ (mm/rev)	0.10	0.30
	Depth of cut : $a_p$ (mm)	1.5 mm x 8 pass	0.5
	Coolant	Wet	Wet
Results	 <p><b>Tool life 4 times!</b></p> <p>AH8015 has good balance between wear and fracture resistance, increasing tool life by 4 times.</p>	 <p><b>Tool life 1.5 times!</b></p> <p>AH8015 provides better surface finish and extends tool life by 1.5 times.</p>	
Workpiece type	Valve parts	Aircraft parts	
Insert	CNMG120408-HRF	CNMG120408-HRF	
Grade	AH8005	AH8005	
Workpiece material	Inconel 718	Inconel 718	
			
Cutting conditions	Cutting speed: $V_c$ (m/min)	100	70
	Feed : $f$ (mm/rev)	0.11 - 0.14	0.17
	Depth of cut : $a_p$ (mm)	0.3	0.5
	Coolant	Wet	Wet
Results	 <p><b>Tool life 1.5 times!</b></p> <p>AH8005 delivers outstanding wear resistance, increasing tool life by 1.5 times.</p>	 <p><b>Tool life 1.3 times!</b></p> <p>AH8005 with excellent wear resistance provides good surface quality and extends tool life by 1.3 times.</p>	

Workpiece type	Seal pin	Turbine parts	
Insert	VCMT160408-PS	CCMT09T304-PSF	
Grade	AH8005	AH8005	
Workpiece material	Inconel 718	Inconel 718	
			
Cutting conditions	Cutting speed: $V_c$ (m/min)	45	100
	Feed : $f$ (mm/rev)	0.20	0.12
	Depth of cut : $a_p$ (mm)	0.5	0.07
	Machining	External turning and facing	External turning
	Coolant	Wet	Wet
Results	 <p>AH8005 with PS chipbreaker improves productivity by 1.3 times due to increased feed rate and speed, doubling tool life.</p>	 <p>AH8005 with PSF chipbreaker provides excellent chip control and wear resistance, extending tool life by 1.5 times.</p>	



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