

**Tungaloy**

Member IMC Group

Keeping the Customer First

Tungaloy Report No. 387-E

**NEW**

Chipbreaker inserts for steel and stainless steel machining

**PSF & PSS** type

**PREMIUMTEC**  
TUNGALOY

Lower cutting force, less chattering & excellent chip control!

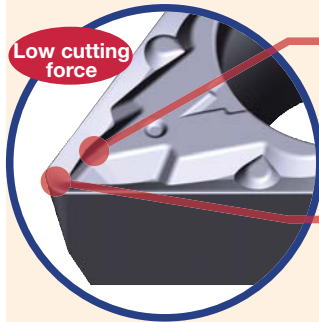


## PSF & PSS Features

### PSF chipbreaker

**P**  
Steel

**M**  
Stainless



**Steep protrusion**  
Ensures a stable and optimal chip control

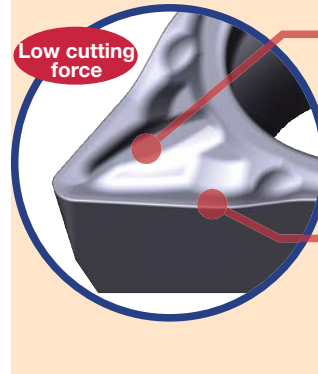
**Unique 2-step rake angle**  
Creates a steady curl of chips credit to its reduced contact area on the rake face.

**Low cutting force**

### PSS chipbreaker

**P**  
Steel

**M**  
Stainless



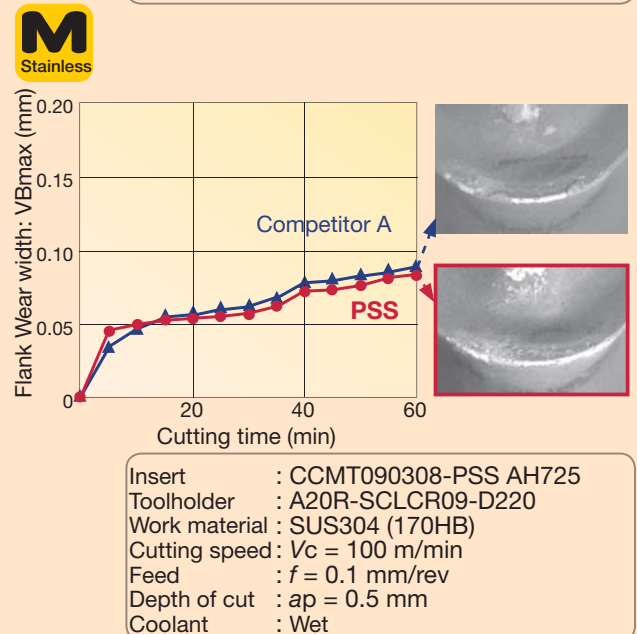
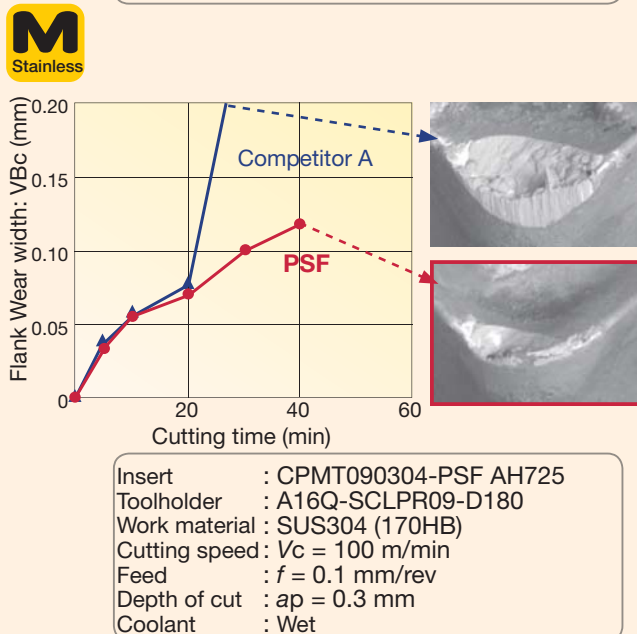
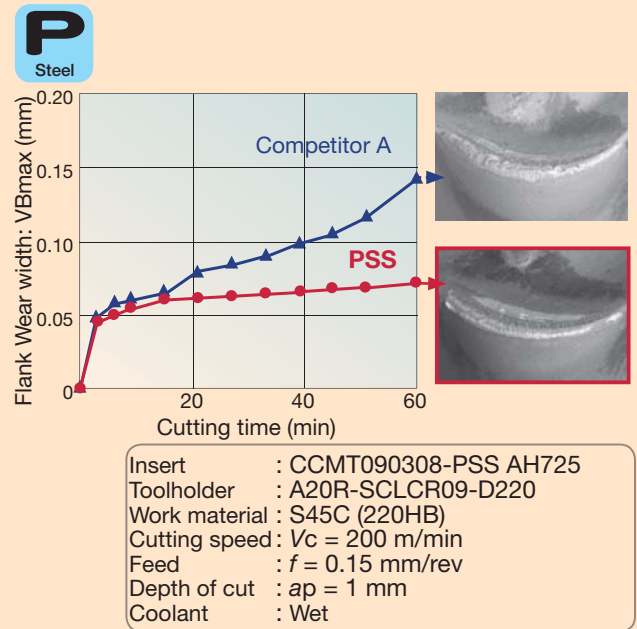
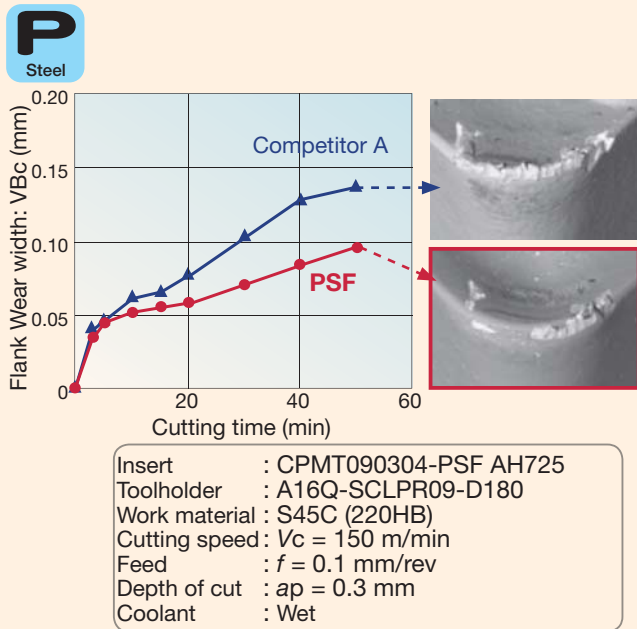
**Arc shaped protrusion**  
Excellent chip control with a sharpened cutting edge that prevents swarf adhesion.

**Well-designed inclination**  
Provides stable cutting performance due to the low cutting force

**Low cutting force**

## Cutting Performance

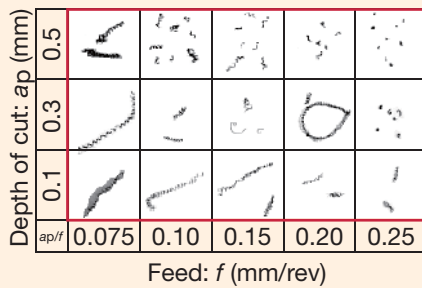
*Highly productive steels and stainless steel machining*



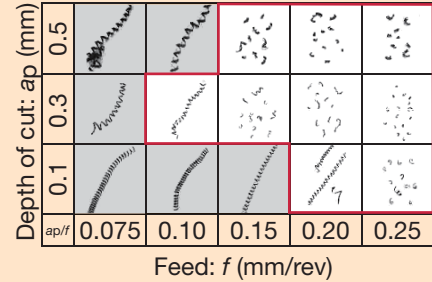
# PSF chipbreaker

# PSS chipbreaker

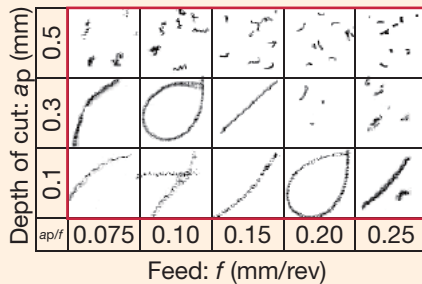
Stable chip control credit to a well balanced geometry



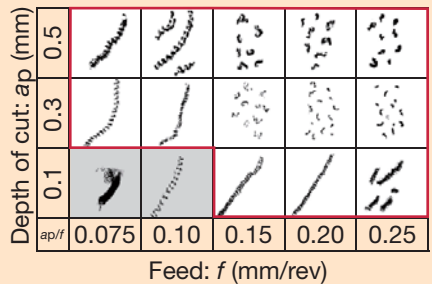
Insert : CPMT090304-PSF AH725  
 Toolholder : A16Q-SCLPR09-D180  
 Work material : S45C (220HB)  
 Cutting speed : Vc = 150 m/min  
 Coolant : Wet



Insert : CCMT090308-PSS AH725  
 Toolholder : A20R-SCLCR09-D220  
 Work material : S45C (240HB)  
 Cutting speed : Vc = 150 m/min  
 Coolant : Wet



Insert : CPMT090304-PSF AH725  
 Toolholder : A16Q-SCLPR09-D180  
 Work material : SUS304 (172HB)  
 Cutting speed : Vc = 100 m/min  
 Coolant : Wet



Insert : CCMT090308-PSS AH725  
 Toolholder : A20R-SCLCR09-D220  
 Work material : SUS304 (160HB)  
 Cutting speed : Vc = 100 m/min  
 Coolant : Wet

## Grade

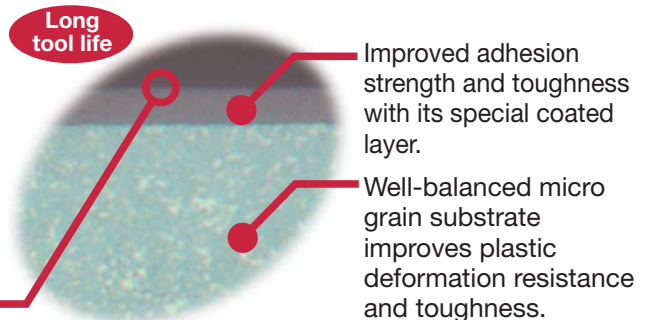
### AH725 New PVD coated grade

The special (Ti,Al)N coated layer and cemented carbide substrate deliver remarkable wear resistance, tool life, hardness and toughness. This grade is highly recommended for steel and stainless steel machining.

Special surface technology

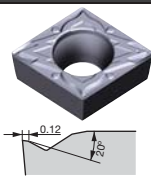
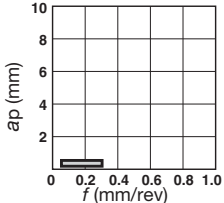
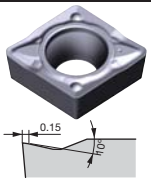
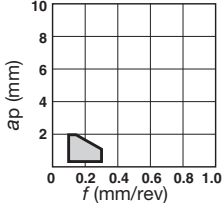
**PREMIUMTEC**

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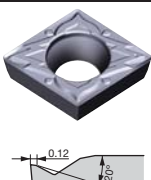
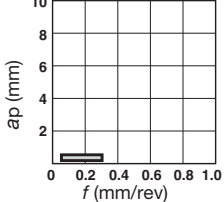
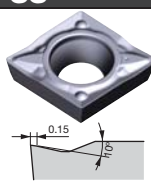
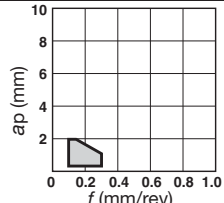


Application	Grade	Substrate			Coating layer		Features
	Application code	Specific gravity	HRA	GPa	Main Composition	Thickness (μm)	
<b>P</b> Steel	AH725	14.4	91.5	3	(Ti,Al)N	2	<b>General grade</b> Excellent wear resistance and toughness
	P20 - P30						
<b>M</b> Stainless	AH725						
	M20 - M30						

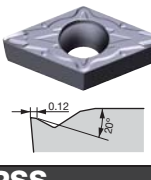
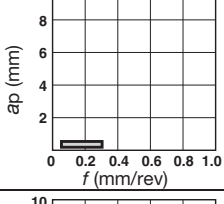
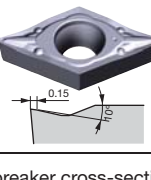
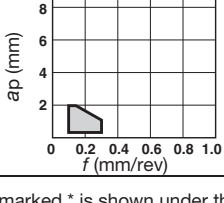
**80° Rhombic, 7° positive**

Application	Chipbreaker Appearance (Cross section)	$f - a_p$	Insert Cat. No. (Metric)	Dimensions (mm)				Grade
				I.C.dia $\phi d$	Thick-ness $s$	Hole dia $\phi d_1$	Corner R $r_\epsilon$	Coated <b>AH725</b>
Finishing	<b>PSF</b> 		CCMT060202-PSF	6.35	2.38	2.8	0.2	●
			CCMT060204-PSF				0.4	●
			CCMT09T302-PSF	9.525	3.97	4.4	0.2	●
			* CCMT09T304-PSF				0.4	●
			CCMT09T308-PSF				0.8	●
Finishing to medium cutting	<b>PSS</b> 		CCMT060204-PSS	6.35	2.38	2.8	0.4	●
			CCMT060208-PSS				0.8	●
			* CCMT09T304-PSS	9.525	3.97	4.4	0.4	●
			CCMT09T308-PSS				0.8	●
			CCMT120404-PSS	12.7	4.76	5.5	0.4	●
			CCMT120408-PSS				0.8	●
CCMT120412-PSS	1.2	●						

**80° Rhombic, 11° positive**

Application	Chipbreaker Appearance (Cross section)	$f - a_p$	Insert Cat. No. (Metric)	Dimensions (mm)				Grade
				I.C.dia $\phi d$	Thick-ness $s$	Hole dia $\phi d_1$	Corner R $r_\epsilon$	Coated <b>AH725</b>
Finishing	<b>PSF</b> 		CPMT060202-PSF	6.35	2.38	2.8	0.2	●
			CPMT060204-PSF				0.4	●
			CPMT080202-PSF	7.94	2.38	3.4	0.2	●
			CPMT080204-PSF				0.4	●
			CPMT090302-PSF	9.525	3.18	4.4	0.2	●
			* CPMT090304-PSF				0.4	●
			CPMT09T302-PSF				0.2	●
Finishing to medium cutting	<b>PSS</b> 		CPMT09T304-PSF	9.525	3.97	4.4	0.4	●
			CPMT060204-PSS	6.35	2.38	2.8	0.4	●
			CPMT080204-PSS				0.4	●
			CPMT080208-PSS	7.94	2.38	3.4	0.8	●
			* CPMT090304-PSS				9.525	3.18
			CPMT090308-PSS	0.8	●			
			CPMT09T304-PSS	9.525	3.97	4.4	0.4	●
CPMT09T308-PSS	0.8	●						

**55° Rhombic, 7° positive**

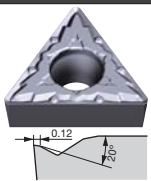
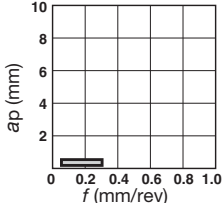
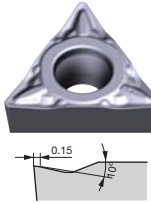
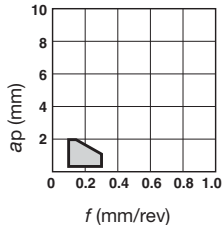
Application	Chipbreaker Appearance (Cross section)	$f - a_p$	Insert Cat. No. (Metric)	Dimensions (mm)				Grade
				I.C.dia $\phi d$	Thick-ness $s$	Hole dia $\phi d_1$	Corner R $r_\epsilon$	Coated <b>AH725</b>
Finishing	<b>PSF</b> 		DCMT070202-PSF	6.35	2.38	2.8	0.2	●
			DCMT070204-PSF				0.4	●
			DCMT11T302-PSF	9.525	3.97	4.4	0.2	●
			* DCMT11T304-PSF				0.4	●
			DCMT11T308-PSF				0.8	●
Finishing to medium cutting	<b>PSS</b> 		DCMT070204-PSS	6.35	2.38	2.8	0.4	●
			DCMT070208-PSS				0.8	●
			* DCMT11T304-PSS	9.525	3.97	4.4	0.4	●
			DCMT11T308-PSS				0.8	●
			DCMT11T312-PSS	9.525	3.97	4.4	1.2	●

Note: The chipbreaker cross-section marked \* is shown under the photographs of inserts.

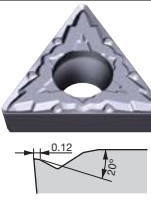
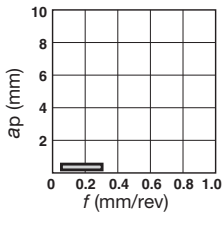
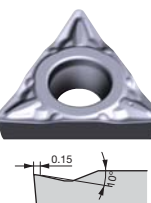
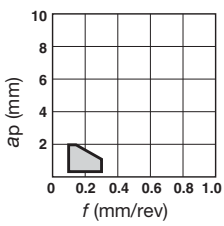
● : Stocked items



### 60° Triangular, 7° positive

Application	Chipbreaker Appearance (Cross section)	$f - a_p$	Insert Cat. No. (Metric)	Dimensions (mm)				Grade
				I.C.dia $\phi d$	Thick- ness $s$	Hole dia $\phi d_1$	Corner R $r_\epsilon$	Coated <b>AH725</b>
Finishing	<b>PSF</b> 		TCMT090202-PSF	5.56	2.38	2.5	0.2	●
			TCMT090204-PSF				0.4	●
			TCMT110202-PSF	6.35	2.38	2.8	0.2	●
			* TCMT110204-PSF				0.4	●
			TCMT110302-PSF	6.35	3.18	2.8	0.2	●
			TCMT110304-PSF				0.4	●
			TCMT16T304-PSF	9.525	3.97	4.4	0.4	●
Finishing to medium cutting	<b>PSS</b> 		TCMT090204-PSS	5.56	2.38	2.5	0.4	●
			TCMT090208-PSS				0.8	●
			* TCMT110204-PSS	6.35	2.38	2.8	0.4	●
			TCMT110208-PSS				0.8	●
			TCMT110304-PSS	6.35	3.18	2.8	0.4	●
			TCMT110308-PSS				0.8	●
			TCMT16T304-PSS	9.525	3.97	4.4	0.4	●
			TCMT16T308-PSS				0.8	●
			TCMT16T312-PSS				1.2	●

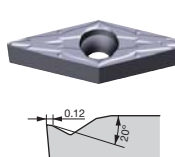
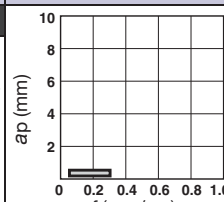
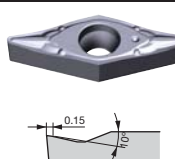
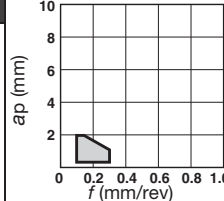
### 60° Triangular, 11° positive

Application	Chipbreaker Appearance (Cross section)	$f - a_p$	Insert Cat. No. (Metric)	Dimensions (mm)				Grade
				I.C.dia $\phi d$	Thick- ness $s$	Hole dia $\phi d_1$	Corner R $r_\epsilon$	Coated <b>AH725</b>
Finishing	<b>PSF</b> 		TPMT090202-PSF	5.56	2.38	2.5	0.2	●
			TPMT090204-PSF				0.4	●
			TPMT110202-PSF	6.35	2.38	2.8	0.2	●
			* TPMT110204-PSF				0.4	●
			TPMT110302-PSF	6.35	3.18	3.4	0.2	●
			TPMT110304-PSF				0.4	●
			TPMT130304-PSF	7.94	3.18	3.4	0.4	●
TPMT16T304-PSF	9.525	3.97	4.4	0.4	●			
Finishing to medium cutting	<b>PSS</b> 		TPMT090204-PSS	5.56	2.38	2.5	0.4	●
			TPMT090208-PSS				0.8	●
			* TPMT110204-PSS	6.35	2.38	2.8	0.4	●
			TPMT110208-PSS				0.8	●
			TPMT110304-PSS	6.35	3.18	3.4	0.4	●
			TPMT110308-PSS				0.8	●
			TPMT130304-PSS	7.94	3.18	3.4	0.4	●
			TPMT130308-PSS				0.8	●
			TPMT16T304-PSS	9.525	3.97	4.4	0.4	●
TPMT16T308-PSS	0.8	●						

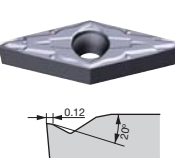
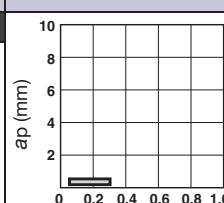
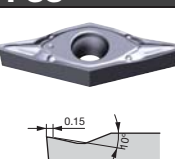
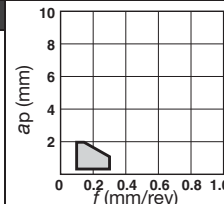
Note: The chipbreaker cross-section marked \* is shown under the photographs of inserts.

● : Stocked items

### 35° Rhombic, 7° positive

Application	Chipbreaker Appearance (Cross section)	$f - a_p$	Insert Cat. No. (Metric)	Dimensions (mm)				Grade
				I.C.dia $\phi d$	Thick- ness $s$	Hole dia $\phi d1$	Corner R $r_\epsilon$	Coated <b>AH725</b>
Finishing	<b>PSF</b> 		VCMT080202-PSF	4.76	2.38	2.3	0.2	●
			VCMT080204-PSF				0.4	●
			VCMT110302-PSF	6.35	3.18	2.8	0.2	●
			VCMT110304-PSF				0.4	●
			* VCMT160404-PSF	9.525	4.76	4.4	0.4	●
VCMT160408-PSF	0.8	●						
Finishing to medium cutting	<b>PSS</b> 		VCMT110304-PSS	6.35	3.18	2.8	0.4	●
			VCMT110308-PSS				0.8	●
			* VCMT160404-PSS	9.525	4.76	4.4	0.4	●
			VCMT160408-PSS				0.8	●

### 35° Rhombic, 5° positive

Application	Chipbreaker Appearance (Cross section)	$f - a_p$	Insert Cat. No. (Metric)	Dimensions (mm)				Grade
				I.C.dia $\phi d$	Thick- ness $s$	Hole dia $\phi d1$	Corner R $r_\epsilon$	Coated <b>AH725</b>
Finishing	<b>PSF</b> 		VBMT110302-PSF	6.35	3.18	2.8	0.2	●
			VBMT110304-PSF				0.4	●
			VBMT160402-PSF	9.525	4.76	4.4	0.2	●
			* VBMT160404-PSF				0.4	●
Finishing to medium cutting	<b>PSS</b> 		VBMT110304-PSS	6.35	3.18	2.8	0.4	●
			VBMT110308-PSS				0.8	●
			* VBMT160404-PSS	9.525	4.76	4.4	0.4	●
			VBMT160408-PSS				0.8	●
			VBMT160412-PSS				1.2	●

Note: The chipbreaker cross-section marked \* is shown under the photographs of inserts.

● : Stocked items

## Standard cutting conditions

Work material	Chip-breaker	Grades	Cutting Speed $V_c$ (m/min)	Depth of cut $a_p$ (mm)	Feed $f$ (mm/rev)			
					$r_\epsilon = 0.2$	$r_\epsilon = 0.4$	$r_\epsilon = 0.8$	$r_\epsilon = 1.2$
Steels S45C, SCM415 etc. (C45, 15CrMo5 etc.)	PSF	AH725	50 - 120 - 180	0.1 - 0.5	0.05 ~ 0.07 ~ 0.1	0.08 ~ 0.12 ~ 0.2	0.08 ~ 0.15 ~ 0.3	-
	PSS			0.3 - 2.0	-			0.1 ~ 0.2 ~ 0.3
Stainless steels SUS304, SUS316 etc. (X5CrNi189, X5CrNiMo18 10 etc.)	PSF		50 - 120 - 150	0.1 - 0.5	0.05 ~ 0.07 ~ 0.1	0.08 ~ 0.12 ~ 0.2	0.08 ~ 0.15 ~ 0.3	-
	PSS			0.3 - 2.0	-			0.1 ~ 0.2 ~ 0.3

# Practical Examples

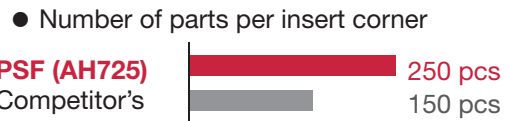
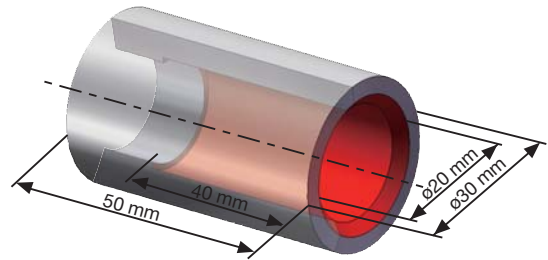
## Tool life improved by 70%

**Insert** : TPMT110304-PSF AH725  
**Toolholder** : A16Q-STUPR1103-D180  
 Work material : SCM415  
 Cutting speed :  $V_c = 125$  m/min  
 Depth of cut :  $a_p = 0.4$  mm  
 Feed :  $f = 0.12$  mm/rev  
 Coolant : Wet

### Results

AH725 has excellent wear resistance, so the grade can achieve 70% longer tool life than competitor grades. The PSF chipbreaker reduces the chip evacuation problems and machine downtime.

### Internal finish turning



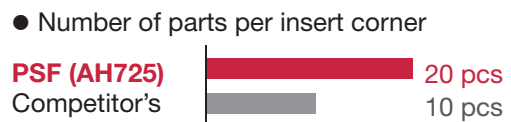
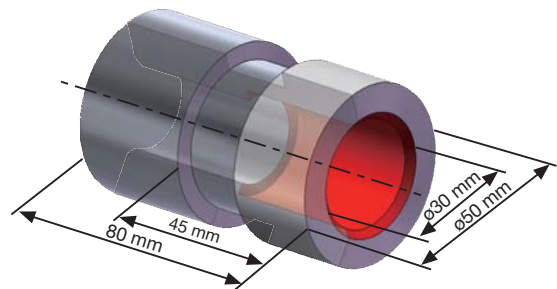
## Reducing cutter chatter

**Insert** : CCMT09T304-PSS AH725  
**Toolholder** : A25S-SCLCR09-D270  
 Work material : SUS304  
 Cutting speed :  $V_c = 110$  m/min  
 Depth of cut :  $a_p = 1.2$  mm  
 Feed :  $f = 0.15$  mm/rev  
 Coolant : Wet

### Results

The PSS chipbreaker reduces tool chatter and the AH725 grade achieves 2 times longer tool life than competitor products due to excellent wear resistance.

### Internal semi-finish turning





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