



Keeping the Customer First

Tungaloy Report No. 400-US

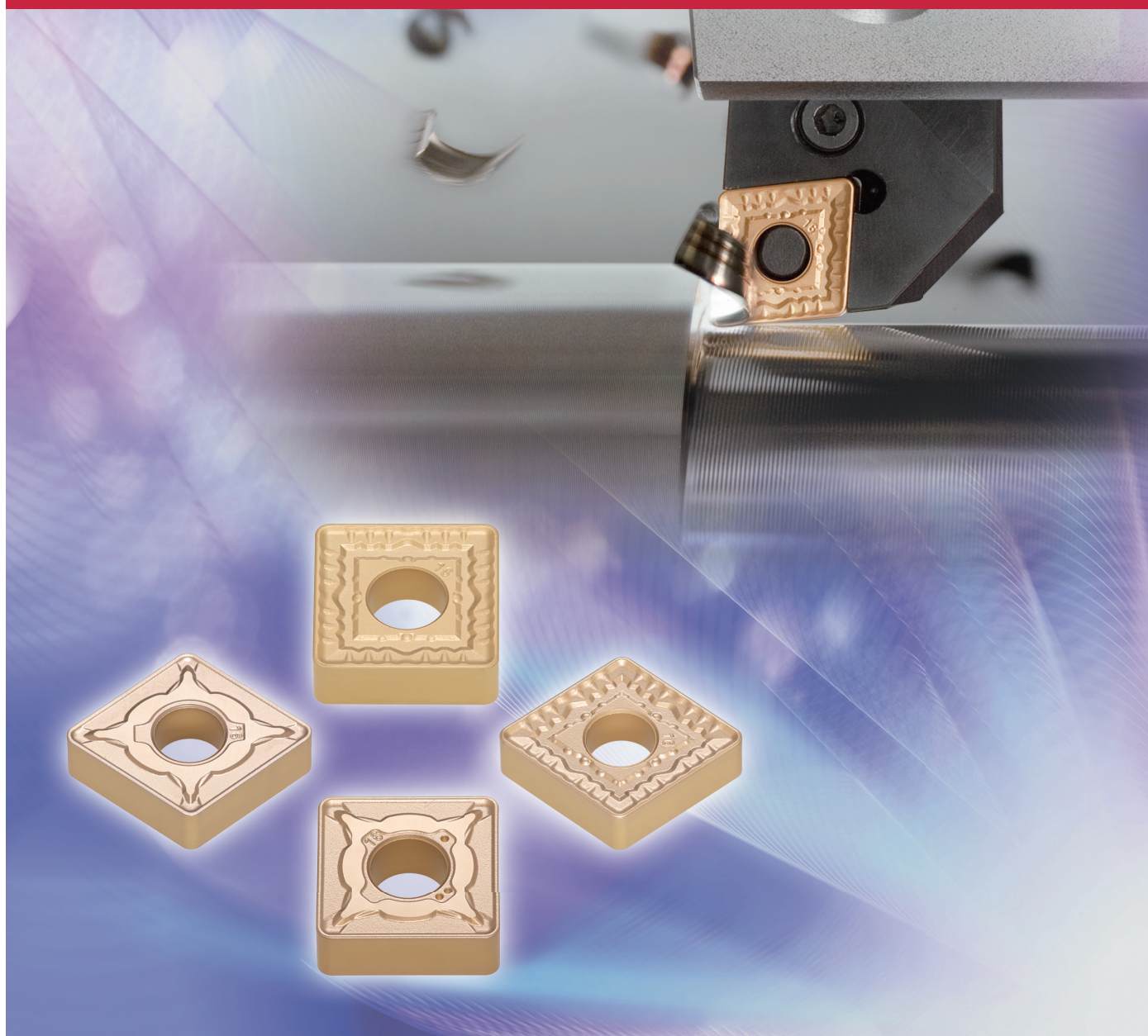
TURNLINE Large inserts for medium to heavy turning

THS & TUS Chipbreaker

NEW

PREMIUMTEC
TUNGALOY

The ultimate chipbreakers for medium to heavy turning!



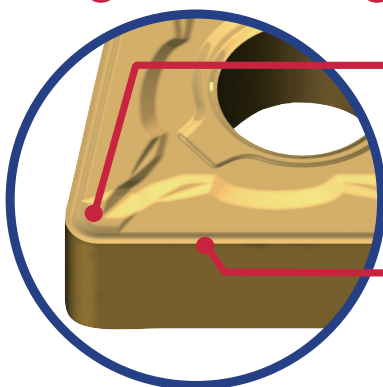
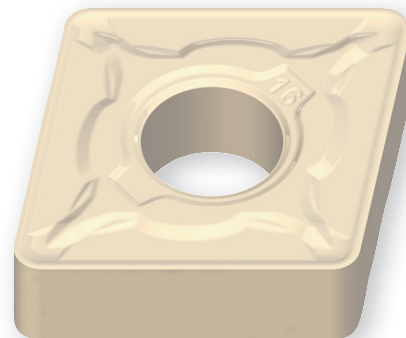
Remarkable reliability in medium to heavy turning of steels!

For medium to heavy turning

THS chipbreaker
(Double sided)

Features

Exceptional chip control under a wide range of cutting conditions!!



Newly designed dimples on the insert corner

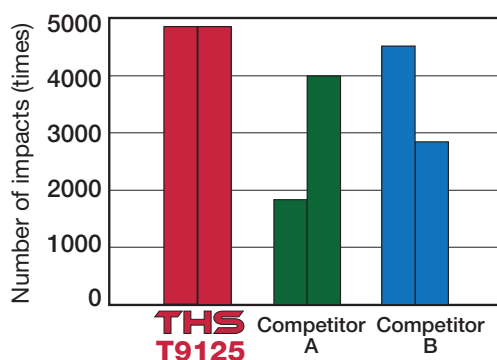
- Excellent chip control even when machining with a small depth of cut
- Suitable for machining with a fluctuating depth of cut

Optimum and tough cutting edge

- Improved fracture resistance
- Provides high strength and low cutting forces

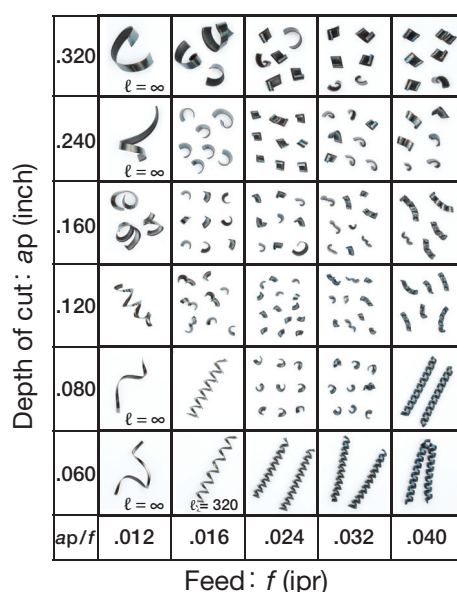
Cutting performance

Heavy interrupted machining test



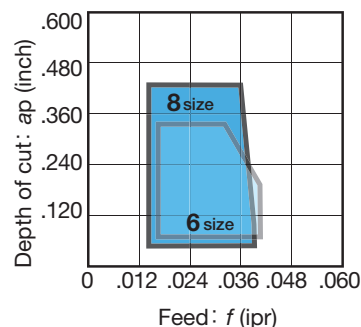
Insert : CNMG644-THS
Work material : 4140 (250HB)
 : $\phi 10'' \times L19''$
 : with 4 slots
Cutting speed : $V_c = 330$ sfm
Depth of cut : $a_p = .160''$
Feed : $f = .020$ ipr
Machining : Facing, heavy interrupted
Coolant : Dry
Machine : NC lathe

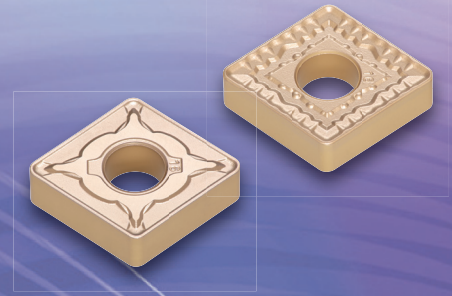
Chip control



Insert : CNMG644-THS
Work material : 4140
Cutting speed : $V_c = 330$ sfm
Coolant : Dry

Application range



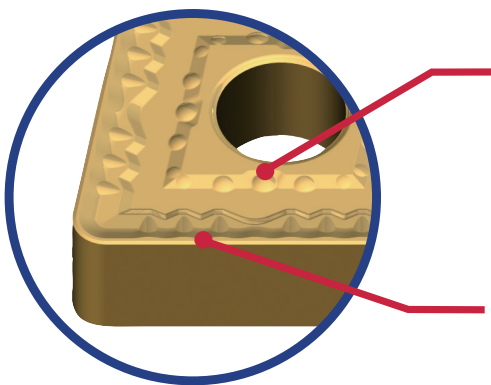
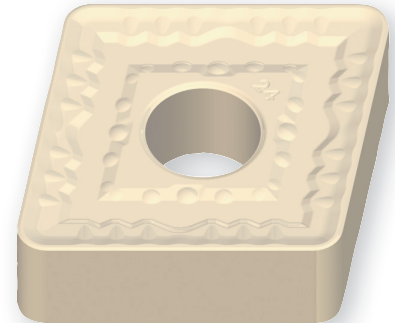


For heavy turning

TUS chipbreaker (Single sided)

Features

Extremely strong cutting edges prevent fractures!



Newly developed chipbreaker for heavy turning

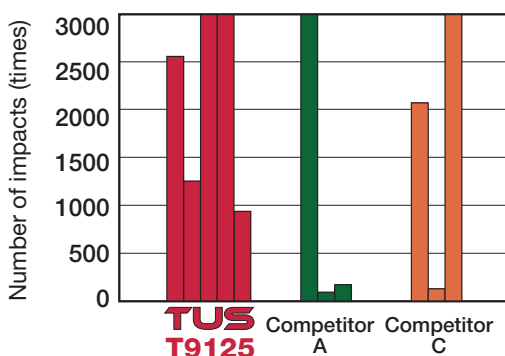
- Uniquely designed protrusions
- Reduction of contact area with chips when machining large depths of cut

Optimum cutting edge design with incredible toughness

- Improved fracture resistance and reduced notch wear

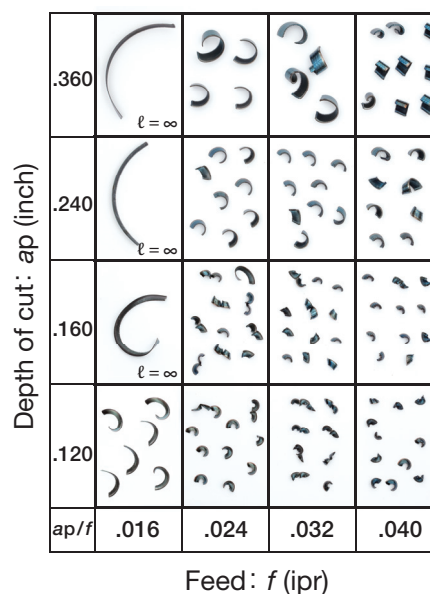
Cutting performance

● Heavy interrupted machining test



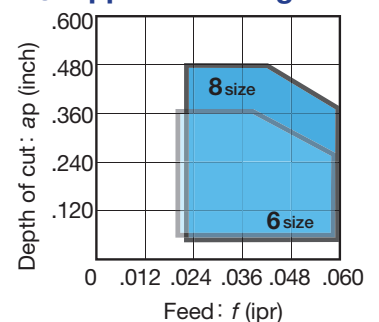
Insert : CNMM644-TUS
 Work material : 4140 (250HB)
 $\phi 10'' \times L19''$
 with 4 slots
 Cutting speed : $V_c = 320$ sfm
 Depth of cut : $a_p = .200''$
 Feed : $f = .032$ ipr
 Machining : Facing, heavy interrupted
 Coolant : Dry
 Machine : NC lathe

● Chip control



Insert : CNMM644-TUS
 Work material : 4140
 Cutting speed : $V_c = 330$ sfm
 Coolant : Dry

● Application range



Grade

T9100 SERIES T9115 and T9125

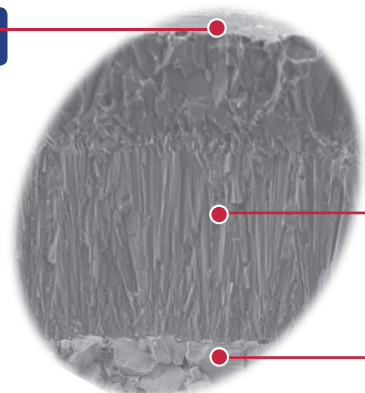
Extremely stable tool life!

Provides a high level of reliability with its excellent fracture resistance!

Special Surface Technology

PREMIUMTEC
TUNGALOY

Smooth insert surface prevents chip adhesion and improves chip flow.



Columnar Stabilization Technology

Prevents randomly developed cracks, providing exceptional fracture resistance.

Adhesion Reinforcement Technology

This specialized treatment enhances the bond between the coating and the substrate.

Applica- tion	Grade	Substrate			Coating layer		Features
	Application code	Specific gravity	Hardness (HRA)	Transverse rupture strength (GPa)	Main Composition	Thickness (μm)	
PSteel	PREMIUMTEC T9115	13.9	91.0	2.5	Continuously formed columnar crystal TiCN + Al ₂ O ₃	16	Highly stable grade for steel turning Special Surface Technology PremiumTec applied T9115 demonstrates a good balance of wear and impact resistance. Applicable for continuous to light interrupted cutting. T9125 demonstrates excellent chipping resistance. Applicable for medium to heavy cutting.
	P10 - P20						
	PREMIUMTEC T9125	13.7	90.0	2.6		16	
	P20 - P30						

Standard cutting conditions

6 size

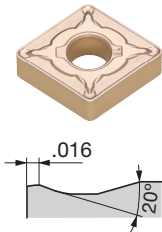
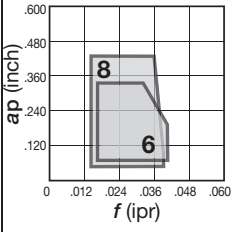
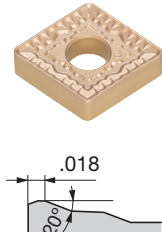
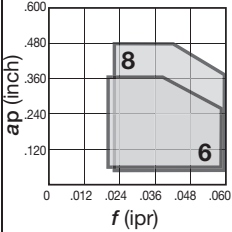
Work materials	Chip-breaker	Grades	Cutting speed V _c (sfm)	Depth of cut a _p (inch)	Feed: f (ipr)				
					r _ε = .031	r _ε = .047	r _ε = .063	r _ε = .094	r _ε = .125
Steels 1045, 1046 etc	THS	T9115	700 (450 - 950)	.200 (.060 - .320)	.014 (.012 - .016)	.020 (.012 - .024)	.024 (.016 - .032)	.028 (.020 - .040)	—
		T9125	450 (300 - 600)		.014 (.012 - .016)	.020 (.012 - .024)	.024 (.016 - .032)	.028 (.020 - .040)	—
	TUS	T9115	700 (450 - 950)	.240 (.120 - .360)	.020 (.018 - .024)	.024 (.018 - .032)	.032 (.020 - .040)	.040 (.024 - .056)	.044 (.026 - .060)
		T9125	450 (300 - 600)		.020 (.018 - .024)	.024 (.018 - .032)	.032 (.020 - .040)	.040 (.024 - .056)	.044 (.026 - .060)

8 size

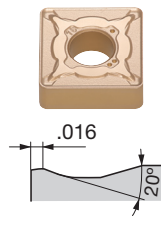
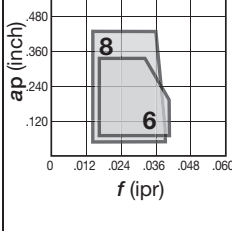
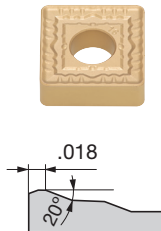
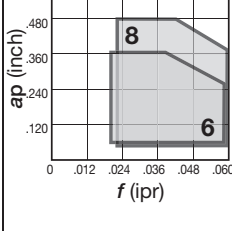
Work materials	Chip-breaker	Grades	Cutting speed V _c (sfm)	Depth of cut a _p (inch)	Feed: f (ipr)		
					r _ε = .063	r _ε = .094	r _ε = .125
Steels 1045, 1046 etc	THS	T9115	700 (450 - 950)	.240 (.060 - .440)	.024 (.016 - .032)	.028 (.020 - .040)	—
		T9125	450 (300 - 600)		.024 (.016 - .032)	.028 (.020 - .040)	—
	TUS	T9115	700 (450 - 950)	.320 (.120 - .480)	.032 (.022 - .044)	.040 (.024 - .056)	.044 (.026 - .060)
		T9125	450 (300 - 600)		.032 (.022 - .044)	.040 (.024 - .056)	.044 (.026 - .060)

Inserts Negative type

Rhombic, 80°

Application	Chipbreaker Appearance (Cross section)	f - ap	Cat. No.	Stocked grades		Dimensions (inch)			
				Coated		I.C.dia ød	Thick- ness s	Hole dia ød1	Corner radius r _ε
				T9115	T9125				
Medium to heavy cutting	THS 		CNMG643-THS	●	●	.750	.250	.312	.047
			*CNMG644-THS	●	●				.063
			CNMG646-THS	●	●				.094
			CNMG866-THS	●	●	1.000	.375	.359	.094
Heavy cutting (Single sided)	TUS 		CNMM642-TUS	●	●	.750	.250	.312	.031
			CNMM643-TUS	●	●				.047
			*CNMM644-TUS	●	●				.063
			CNMM646-TUS	●	●	1.000	.375	.359	.094
			CNMM648-TUS	●	●				.125
			CNMM864-TUS	●	●				.063
			CNMM866-TUS	●	●				.094
			CNMM868-TUS	●	●				.125

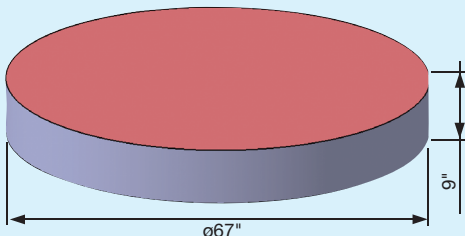
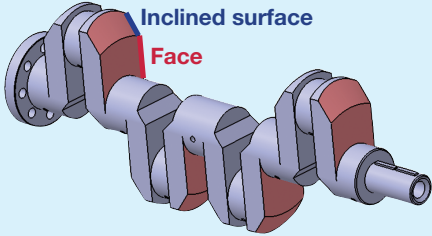
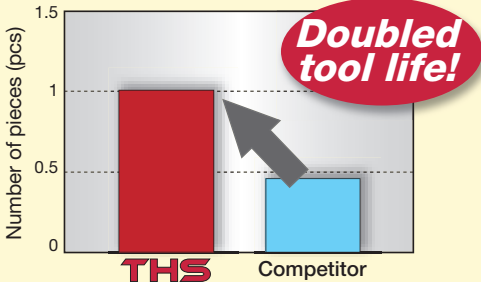
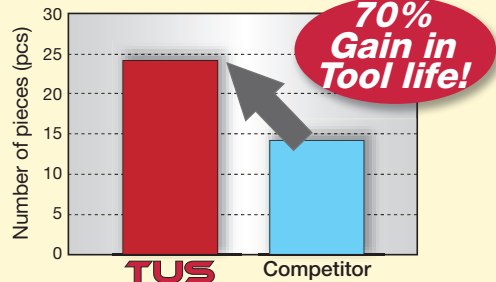
Square, 90°

Application	Chipbreaker	$f - ap$	Cat. No.	Stocked grades		Dimensions (inch)				
	Appearance (Cross section)			Coated		I.C.dia ød	Thick- ness s	Hole dia ød1	Corner radius r_{ϵ}	
				T9115	T9125					
Medium to heavy cutting	THS			SNMG642-THS	●	●	.750	.250	.312	.031
	SNMG643-THS	●	●	.047						
	*SNMG644-THS	●	●	.063						
	SNMG646-THS	●	●	1.000	.313	.359	.094			
	SNMG854-THS	●	●				.063			
	SNMG856-THS	●	●				.094			
Heavy cutting (Single sided)	TUS			SNMM643-TUS	●	●	.750	.250	.312	.047
	*SNMM644-TUS	●	●	.063						
	SNMM646-TUS	●	●	.094						
	SNMM856-TUS	●	●	1.000	.313	.359	.094			
	SNMM858-TUS	●	●				.125			
	SNMM866-TUS	●	●		.375		.094			
	SNMM868-TUS	●	●				.125			

*Note: Chipbreaker cross sections are of the inserts marked *.

● : Stocked items

Practical examples

Work piece type		Turbine disk (raw material)	Crankshaft (for marine engine)
Toolholder		SNMG644-THS	SNMM644-TUS
Insert		T9125	T9125
		4340	4140
Work material			
Cutting conditions	Cutting speed: V_c (sfm)	200	525
	Feed: f (ipr)	.030	.020
	Depth of cut: a_p (inch)	.200	.120
	Machining	External turning & facing (Continuous machining)	Total 8 places (heavy interrupted)
	Coolant	Wet	Wet
Results		 Excellent chip control and stable tool life without sudden fracture, even when cutting with a fluctuating depth of cut.	 No sudden fracture due to very strong cutting edge.



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