

**Tungaloy**

Member IMC Group

Keeping the Customer First

Tungaloy Report No. 400-E

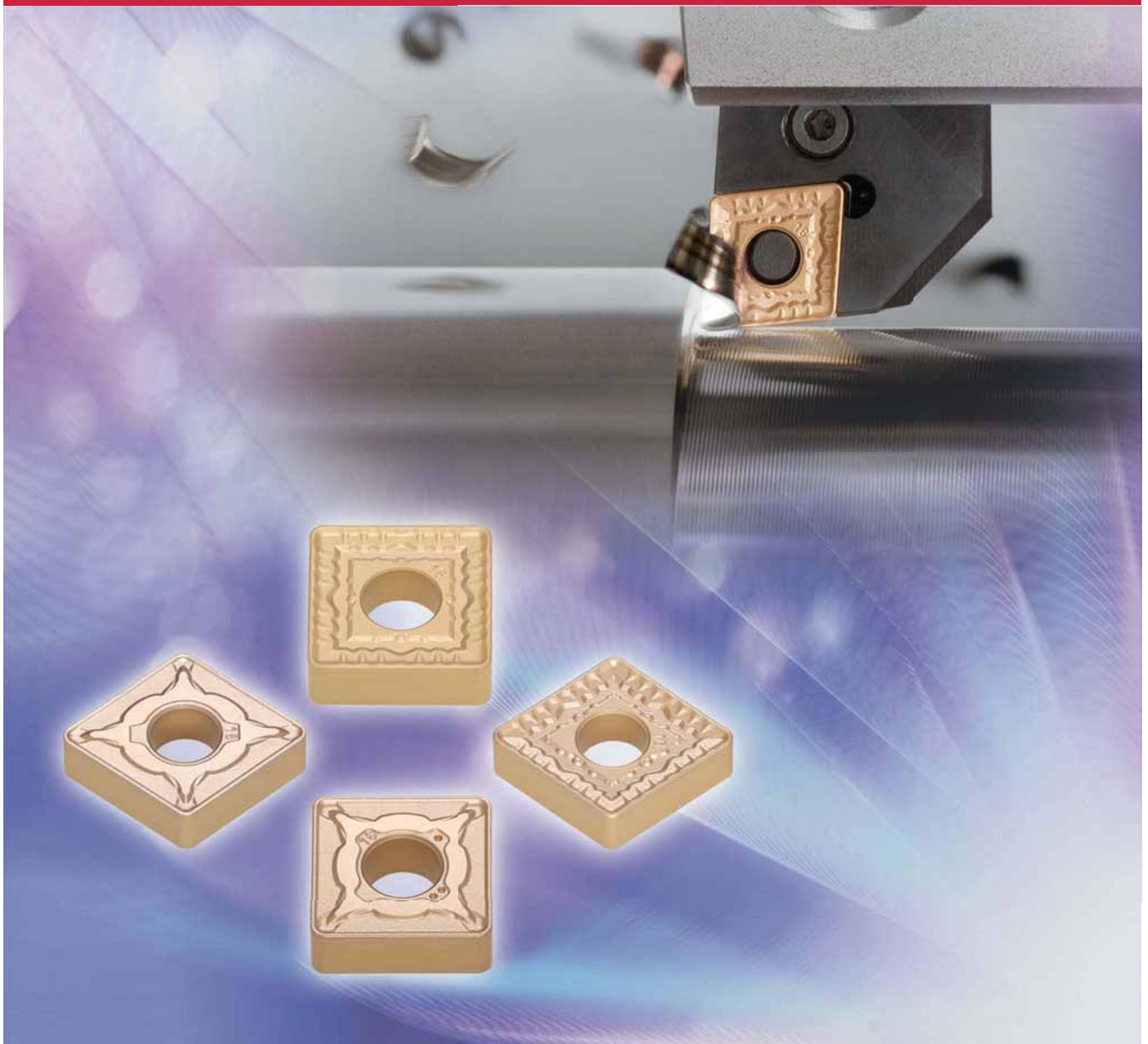
**TURNLINE** Large inserts for medium to heavy turning

**NEW**

**THS & TUS** Chipbreaker

**PREMIUMTEC**  
TUNGALOY

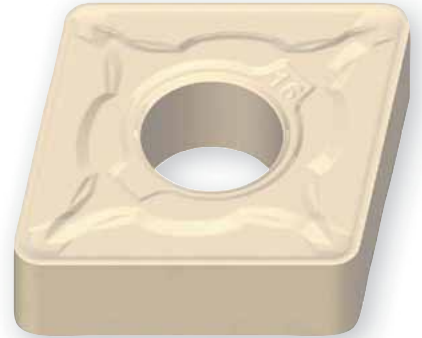
The ultimate chipbreakers for medium to heavy steel turning!



# Remarkable reliability in medium to heavy turning of steels!

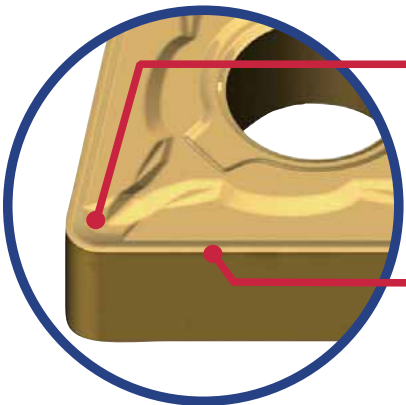
For medium to heavy turning

**THS** chipbreaker  
(Double sided)



## Features

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



**Newly designed dimples on the insert corner**

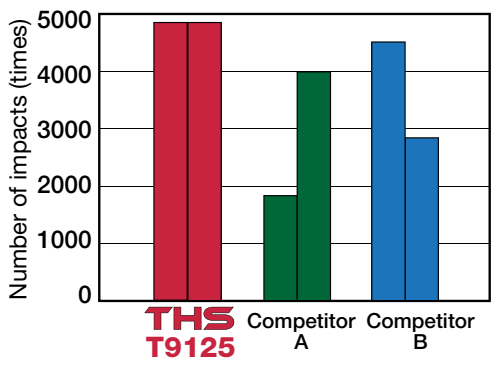
- Excellent chip control even when machining with a small depth of cut
- Suitable for machining with a fluctuating depth of cut

**Optimum and tough cutting edge**

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

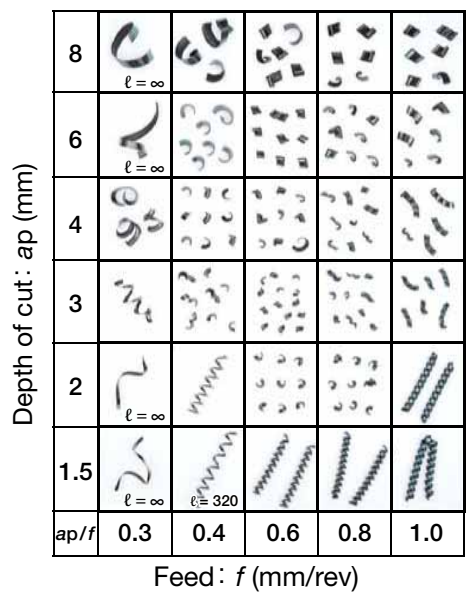
## Cutting performance

### ● Heavy interrupted machining test



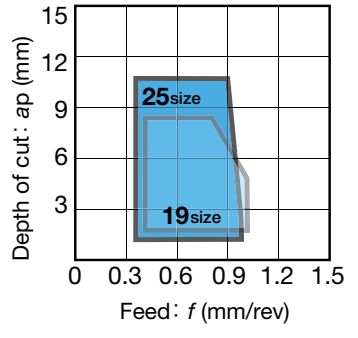
Insert : CNMG190616-THS  
 Work material : SCM440 / 42CrMo4 (250HB)  
 ø250 mm x L480 mm with 4 slots  
 Cutting speed :  $V_c = 100$  m/min  
 Depth of cut :  $a_p = 4$  mm  
 Feed :  $f = 0.5$  mm/rev  
 Machining : Facing, heavy interrupted  
 Coolant : Dry  
 Machine : NC lathe

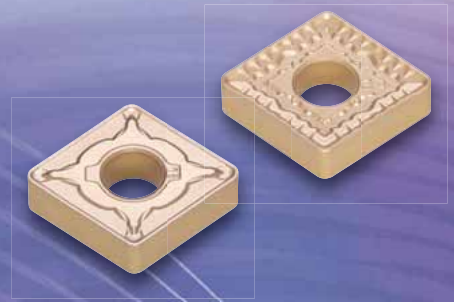
### ● Chip control



Insert : CNMG190616-THS  
 Work material : SCM440 / 42CrMo4  
 Cutting speed:  $V_c = 100$  m/min  
 Coolant : Dry

### ● Application range





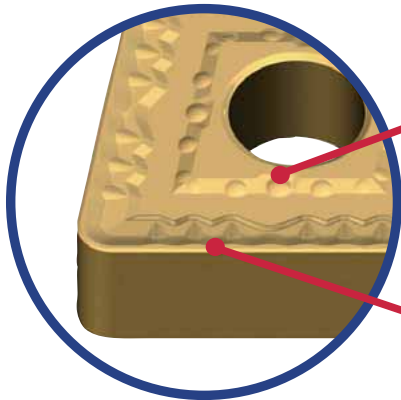
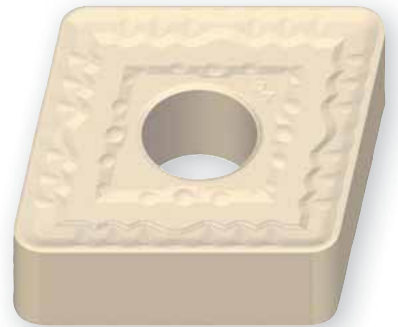
## For heavy turning of steels

# TUS chipbreaker

(Single sided)

## Features

**Extremely strong cutting edges prevent fractures!**



### Newly developed chipbreaker for heavy turning

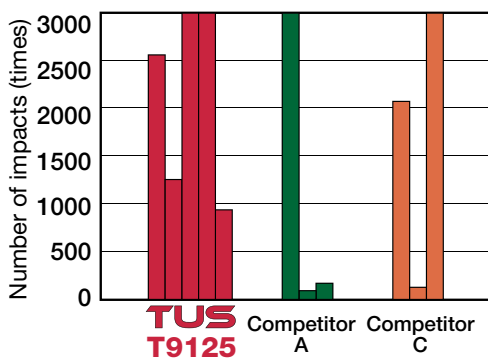
- Uniquely designed protrusions
- Reduction of contact area with chips when machining large depths of cut

### Optimum cutting edge design with incredible toughness

- Improved fracture resistance and reduced notch wear

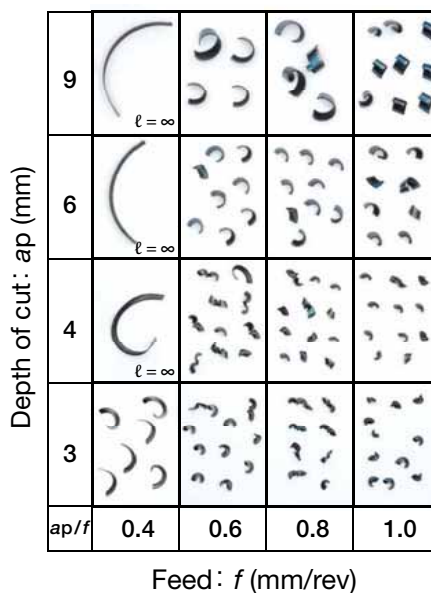
## Cutting performance

### ● Heavy interrupted machining test



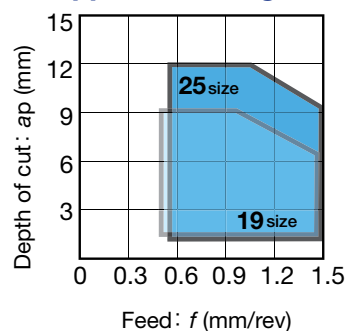
Insert : CNMM190616-TUS  
 Work material : SCM440 / 42CrMo4 (250HB)  
 ø250 mm x L480 mm with 4 slots  
 Cutting speed :  $V_c = 100$  m/min  
 Depth of cut :  $a_p = 5$  mm  
 Feed :  $f = 0.8$  mm/rev  
 Machining : Facing, heavy interrupted  
 Coolant : Dry  
 Machine : NC lathe

### ● Chip control



Insert : CNMM190616-TUS  
 Work material : SCM440 / 42CrMo4  
 Cutting speed :  $V_c = 100$  m/min  
 Coolant : Dry

### ● Application range



# Grade

## T9100 SERIES T9115 and T9125

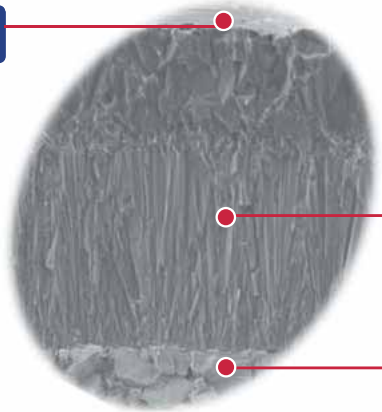
**Extremely stable tool life!**

**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.

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

## Standard cutting conditions

### 19 size

Work materials	Chip-breaker	Grades	Cutting speed Vc (m/min)	Depth of cut ap (mm)	Feed: f (mm/rev)				
					r <sub>ε</sub> = 0.8	r <sub>ε</sub> = 1.2	r <sub>ε</sub> = 1.6	r <sub>ε</sub> = 2.4	r <sub>ε</sub> = 3.2
Steels S45C, SCM415 / C45, 15CrMo5 etc	<b>THS</b>	<b>T9115</b>	220 (150 - 300)	5.0 (1.5 - 8.0)	0.35 (0.3 - 0.4)	0.5 (0.3 - 0.6)	0.6 (0.4 - 0.8)	0.7 (0.5 - 1.0)	–
		<b>T9125</b>	150 (80 - 200)		0.35 (0.3 - 0.4)	0.5 (0.3 - 0.6)	0.6 (0.4 - 0.8)	0.7 (0.5 - 1.0)	–
	<b>TUS</b>	<b>T9115</b>	220 (150 - 300)	6.0 (3.0 - 9.0)	0.5 (0.45 - 0.6)	0.6 (0.45 - 0.8)	0.8 (0.5 - 1.0)	1.0 (0.6 - 1.4)	1.1 (0.65 - 1.5)
		<b>T9125</b>	150 (80 - 200)		0.5 (0.45 - 0.6)	0.6 (0.45 - 0.8)	0.8 (0.5 - 1.0)	1.0 (0.6 - 1.4)	1.1 (0.65 - 1.5)

### 25 size

Work materials	Chip-breaker	Grades	Cutting speed Vc (m/min)	Depth of cut ap (mm)	Feed: f (mm/rev)		
					r <sub>ε</sub> = 1.6	r <sub>ε</sub> = 2.4	r <sub>ε</sub> = 3.2
Steels S45C, SCM415 / C45, 15CrMo5 etc	<b>THS</b>	<b>T9115</b>	220 (150 - 300)	6.0 (1.5 - 11.0)	0.6 (0.4 - 0.8)	0.7 (0.5 - 1.0)	–
		<b>T9125</b>	150 (80 - 200)		0.6 (0.4 - 0.8)	0.7 (0.5 - 1.0)	–
	<b>TUS</b>	<b>T9115</b>	220 (150 - 300)	8.0 (3.0 - 12.0)	0.8 (0.55 - 1.1)	1.0 (0.6 - 1.4)	1.1 (0.65 - 1.5)
		<b>T9125</b>	150 (80 - 200)		0.8 (0.55 - 1.1)	1.0 (0.6 - 1.4)	1.1 (0.65 - 1.5)

# Inserts Negative type

## Rhombic, 80°

Application	Chipbreaker	$f - a_p$	Cat. No.	Stocked grades		Dimensions (mm)			
	Appearance (Cross section)			Coated		I.C. dia $\varnothing d$	Thick- ness s	Hole dia $\varnothing d_1$	Corner radius $r_E$
				T9115	T9125				
Medium to heavy cutting	<b>THS</b>		CNMG190612-THS	●	●	19.05	6.35	7.93	1.2
	*CNMG190616-THS		●	●	1.6				
	CNMG190624-THS		●	●	2.4				
	CNMG250924-THS		●	●	25.4	9.52	9.12	2.4	
Heavy cutting (Single sided)	<b>TUS</b>		CNMM190608-TUS	●	●	19.05	6.35	7.93	0.8
	CNMM190612-TUS		●	●	1.2				
	*CNMM190616-TUS		●	●	1.6				
	CNMM190624-TUS		●	●	2.4				
	CNMM190632-TUS		●	●	3.2				
	CNMM250916-TUS		●	●	25.4	9.52	9.12	1.6	
	CNMM250924-TUS		●	●				2.4	
	CNMM250932-TUS		●	●				3.2	

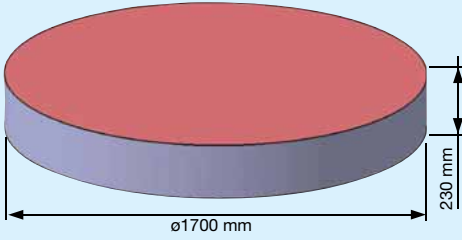
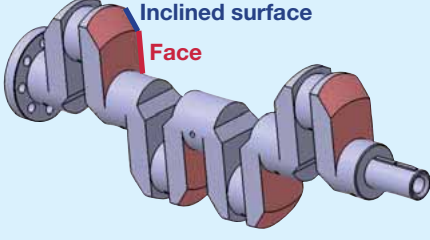
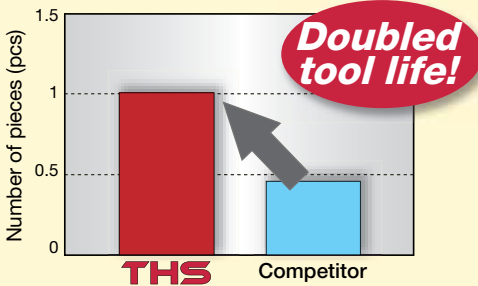
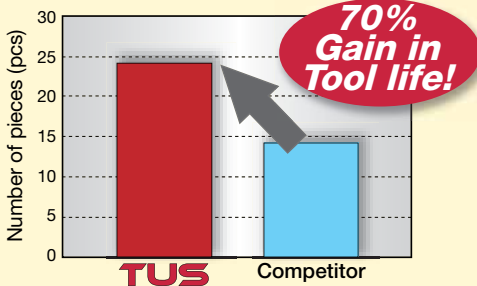
## Square, 90°

Application	Chipbreaker	$f - a_p$	Cat. No.	Stocked grades		Dimensions (mm)			
	Appearance (Cross section)			Coated		I.C. dia $\varnothing d$	Thick- ness s	Hole dia $\varnothing d_1$	Corner radius $r_E$
				T9115	T9125				
Medium to heavy cutting	<b>THS</b>		SNMG190608-THS	●	●	19.05	6.35	7.93	0.8
	SNMG190612-THS		●	●	1.2				
	*SNMG190616-THS		●	●	1.6				
	SNMG190624-THS		●	●	2.4				
	SNMG250716-THS		●	●	25.4	7.94	9.12	1.6	
	SNMG250724-THS		●	●				2.4	
Heavy cutting (Single sided)	<b>TUS</b>		SNMM190612-TUS	●	●	19.05	6.35	7.93	1.2
	*SNMM190616-TUS		●	●	1.6				
	SNMM190624-TUS		●	●	2.4				
	SNMM250724-TUS		●	●	25.4	7.94	9.12	2.4	
	SNMM250732-TUS		●	●				3.2	
	SNMM250924-TUS		●	●	25.4	9.52	9.12	2.4	
SNMM250932-TUS	●	●	3.2						

\*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		SNMG190616-THS	SNMM190616-TUS
Insert		T9125	T9125
Work material		SNCM429 / 41CrNiMo4	SCM440 / 42CrMo4
Work material			
Cutting conditions	Cutting speed: $V_c$ (m/min)	60	160
	Feed: $f$ (mm/rev)	0.7	0.5
	Depth of cut: $a_p$ (mm)	5	3
	Machining	External turning & facing (Continuous machining)	Total 8 places (heavy interrupted)
Coolant		Wet	Wet
Results		 <p><b>Excellent chip control and stable tool life without sudden fracture, even when cutting with a fluctuating depth of cut.</b></p>	 <p><b>No sudden fracture due to very strong cutting edge.</b></p>



# Tungaloy Corporation

## Tungaloy Corporation (Head office)

11-1 Yoshima-Kogyodanchi  
Iwaki-city, Fukushima, 970-1144 Japan  
Phone: +81-246-36-8501 Fax: +81-246-36-8542  
www.tungaloy.co.jp

## Tungaloy America, Inc.

Phone: +1-888-554-8394 Fax: +1-888-554-8392  
www.tungaloyamerica.com

## Tungaloy Canada

Phone: +1-519-758-5779 Fax: +1-519-758-5791  
www.tungaloyamerica.com

## Tungaloy de Mexico S.A.

Phone: +52-449-929-5410 Fax: +52-449-929-5411  
www.tungaloy.com

## Tungaloy do Brasil Comércio de Ferramentas de Corte Ltda.

Phone: +55-19-38262757 Fax: +55-19-38262757  
www.tungaloy.co.jp/br

## Tungaloy Germany GmbH

Phone: +49-2173-90420-0 Fax: +49-2173-90420-19  
www.tungaloy.de

## Tungaloy France S.A.S.

Phone: +33-1-6486-4300 Fax: +33-1-6907-7817  
www.tungaloy.fr

## Tungaloy Italia S.r.l.

Phone: +39-02-252012-1 Fax: +39-02-252012-65  
www.tungaloy.it

## Tungaloy Czech s.r.o

Phone: +420 532 123 391 Fax: +420 532 123 392  
www.tungaloy.cz

## Tungaloy Ibérica S.L.

Phone: +34 93 1131360 Fax: +34 93 1131361  
www.tungaloy.es

## Tungaloy Scandinavia AB

Phone: +46-462119200 Fax: +46-462119207  
www.tungaloy.co.jp/se

## Tungaloy Rus, LLC

Phone: +7 4722 58 57 57 Fax: +7 4722 58 57 83  
www.tungaloy.co.jp/ru

## Tungaloy Polska Sp. z o.o

Phone: +48-22-617-0890 Fax: +48-22-617-0890  
www.tungaloy.co.jp/pl

## Tungaloy UK Ltd

Phone: +44 121 309 0163 Fax: +44 121 270 9694  
www.tungaloy.co.jp/uk

## Tungaloy Cutting Tool (Shanghai) Co.,Ltd.

Phone: +86-21-3632-1880 Fax: +86-21-3621-1918  
www.tungaloy.co.jp/tcts

## Tungaloy Cutting Tool (Thailand) Co.,Ltd.

Phone: +66-2-714-3130 Fax: +66-2-714-3134  
www.tungaloy.co.th

## Tungaloy Singapore (Pte.),Ltd.

Phone: +65-6391-1833 Fax: +65-6299-4557  
www.tungaloy.co.jp/tspl

## Tungaloy India Pvt. Ltd.

Phone: +91-22-6124-8804 Fax: +91-22-6124-8899  
www.tungaloy.co.jp/in

## Tungaloy Korea Co., Ltd

Phone: +82-2-6393-8930 Fax: +82-2-6393-8952  
www.tungaloy.co.jp/kr

## Tungaloy Malaysia Sdn Bhd

Phone: +603-7805-3222 Fax: +603-7804-8563  
www.tungaloy.co.jp/my

## Tungaloy Australia Pty Ltd

Phone: +612-9672-6844 Fax: +612-9672-6866  
www.tungaloy.co.jp/au

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