

MillLine

**TUNG**<sup>RI</sup>**TSHRED**

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

Tungaloy Report No. 505-G

TUNGTRI-SHRED

## Highly productive roughing cutter with serrated edges





ACCELERATED MACHINING

MillLine

**TUNG<sup>TRI</sup>SHRED**  
TUNGALOY

**TUNG<sup>FORCE</sup>MILL**  
ACCELERATED MACHINING



TungTri-Shred combines the advantages of Triangular insert with **chip splitting technology** for rough machining **with long overhang**.

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

# Long-edge rough milling with small chips effectively prevents chatter

## Anti Chatter Design

- Wavy cutting edge shape creates smaller chips reducing chatter.



TUNGTRI SHRED

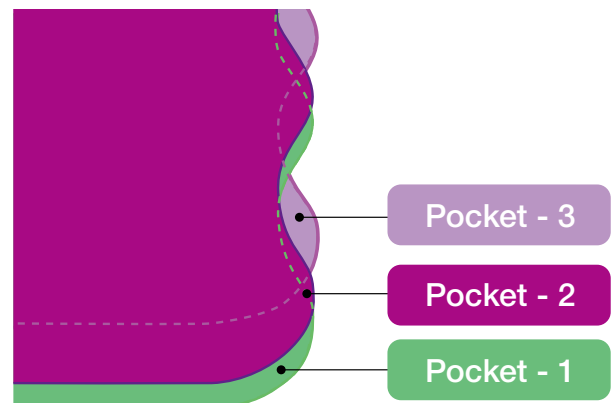


Conventional

- Triangular insert shape and pocket seating ensures rigid clamping during heavy duty machining.

## Intelligent and User friendly design

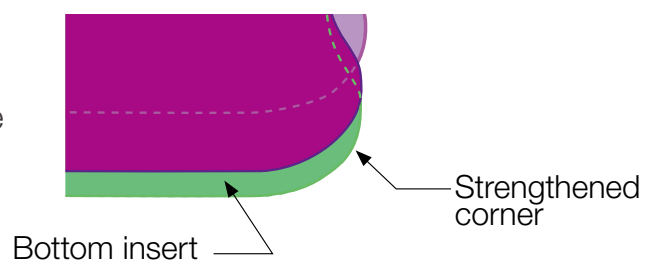
- Each flute (adjacent pockets in radial direction) in the cutter body is offsetted in Z direction. This positioning ensures that the insert in the adjacent flute removes the crest left by the previous insert. Thus, the surface of machined wall is close to be flat.



- No specific insert positioning required as positioning is done on the cutter.

- All cutting edges of the Inserts are identical.

- Insert corner is strengthened to resist corner chip off for the bottom most insert. (the bottom most insert is a single effective corner and withstands the feed equal to feed/rev)



## Insert Varieties

2 types of insert fit on the same cutter body providing option for roughing as well as finishing.



**TCMT-NMJ**

For roughing operation with serrated edges  
 - Low cutting force

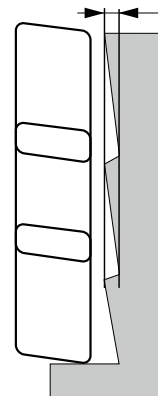
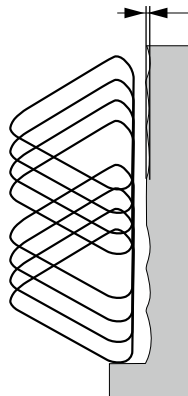


**TCGT-MJ**

Suitable for finishing operation or general shoulder square milling.  
 - Low cutting force with large rake angle  
 - Precise periphery ground insert and unique off-setted positioning of the pocket ensures minimal gap on the machined wall.

Small gap

Large gap

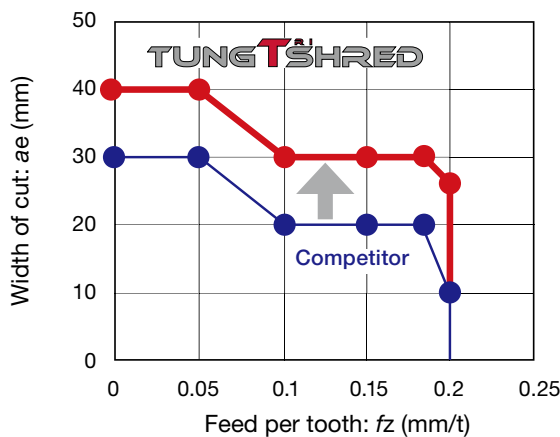


**TUNGTRI-SHRED**

Conventional, Competitor

## CUTTING PERFORMANCE

### Comparison of application range



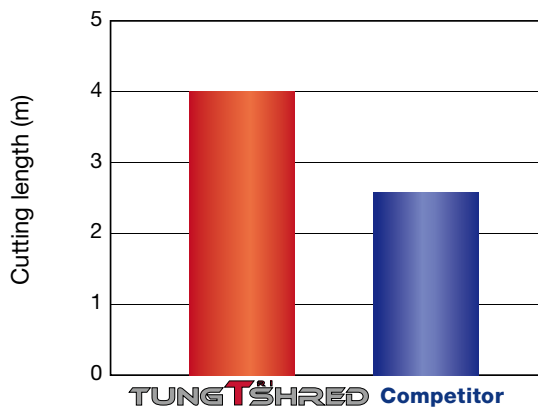
Cutter : LPTC16M080B32.0L076R04 ( $\phi D_c = 80$  mm,  $z = 4$ )  
 Insert : TCMT160620PDER-NMJ  
 Workpiece material : 42CrMo4 / SCM440H (270HB)  
 Cutting speed :  $V_c = 100$  m/min  
 Depth of cut :  $a_p = 70$  mm  
 Machine : Vertical M/C (BT50, 37 kw)

**TungTri-Shred can be applied for a wider cutting area.**

## CUTTING PERFORMANCE

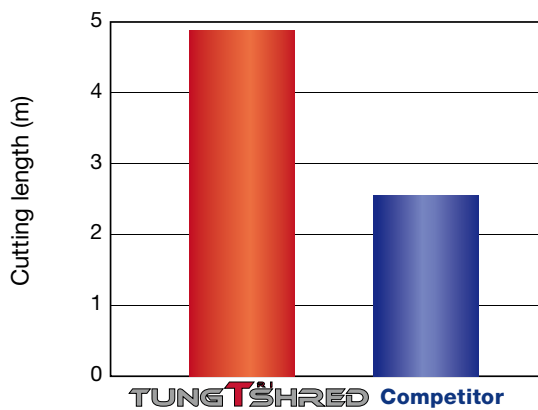
### Tool life

#### P Carbon steel with NMJ type



Cutter : LPTC16M080B32.0L076R04 ( $\phi D_c = 80$  mm,  $z = 4$ )  
 Insert : TCMT160620PDER-NMJ AH3135  
 Workpiece material : S55C / C55 (200HB)  
 Cutting speed :  $V_c = 150$  m/min  
 Feed per tooth :  $f_z = 0.18$  mm/t  
 Depth of cut :  $a_p = 10$  mm  
 Width of cut :  $a_e = 40$  mm  
 Coolant : Dry  
 Machine : Vertical M/C, BT50, 30kW  
 Machining : Heavy interrupted  
 Tool life criteria : Chipping on edge

#### P Alloy steel with MJ type

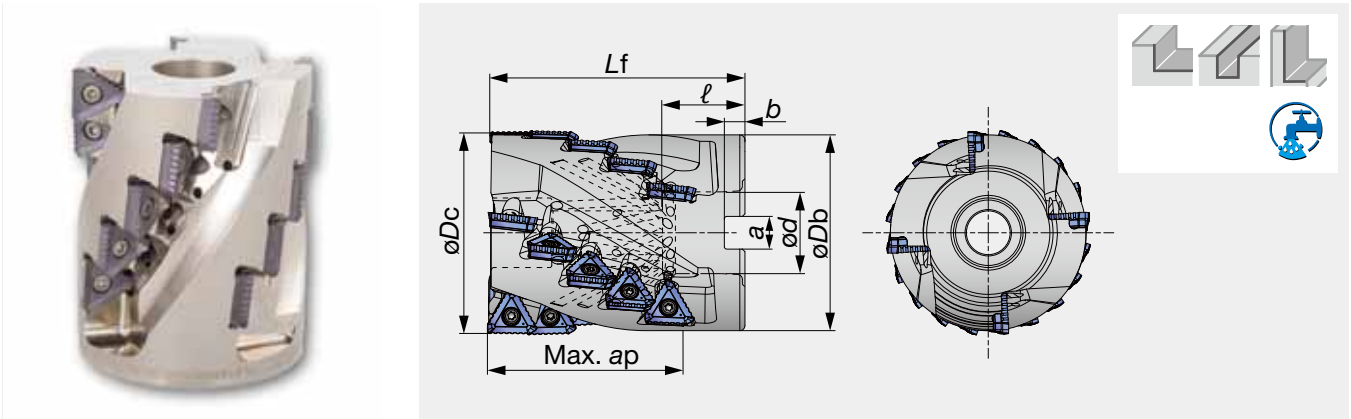


Cutter : LPTC16M080B32.0L076R04 ( $\phi D_c = 80$  mm,  $z = 4$ )  
 Insert : TCGT160608PDER-MJ AH3135  
 Workpiece material : SCM440 / 42CrMo4 (270HB)  
 Cutting speed :  $V_c = 150$  m/min  
 Feed per tooth :  $f_z = 0.15$  mm/t  
 Depth of cut :  $a_p = 10$  mm  
 Width of cut :  $a_e = 40$  mm  
 Coolant : Dry  
 Machine : Vertical M/C, BT50, 30kW  
 Machining : Heavy interrupted  
 Tool life criteria : Chipping on edge

Square shoulder milling cutters for roughing with shred insert

## CUTTER - ROUGHING TYPE - BORE

TungTri-Shred LPTC16



Designation	Max. ap	øDc	Z eff	z	øDb	Lf	ød	l	a	b	Kg	C.bolt	Insert
LPTC16J063B25.4L061R03	61.0	63.00	3	12	59	85.0	25.400	26.00	9.50	6.00	1.25	CAP-CM12X1.75X50	TC*T16
LPTC16M063B27.0L061R03	61.0	63.00	3	12	59	85.0	27.000	22.00	12.40	7.00	1.24	CAP-CM12X1.75X50	TC*T16
LPTC16J080B31.7L076R04	76.0	80.00	4	20	76	100.0	31.750	32.00	12.70	8.00	2.44	CM16X75	TC*T16
LPTC16M080B32.0L076R04	76.0	80.00	4	20	76	100.0	32.000	25.00	14.40	8.00	2.46	CM16X75	TC*T16

### SPARE PARTS

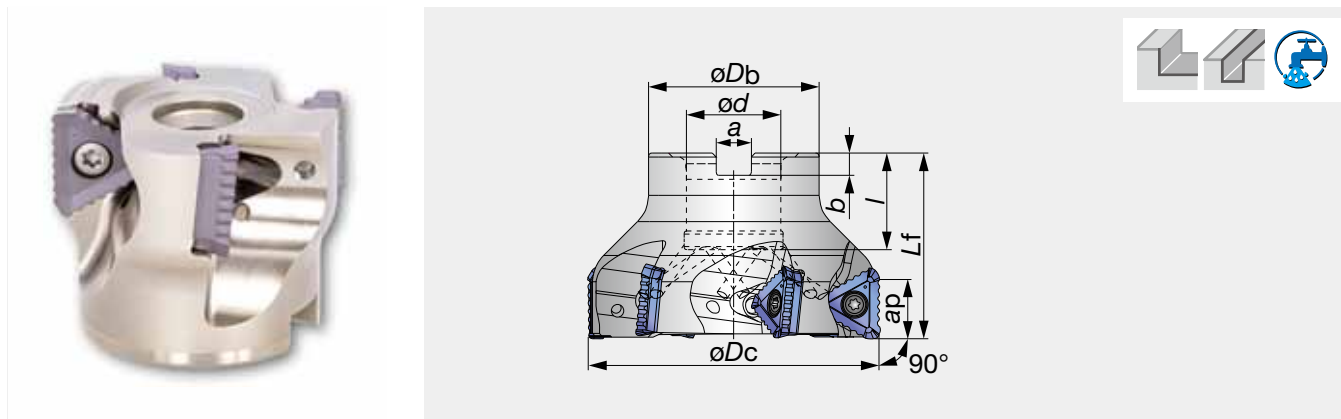


Clamping screw	Wrench	
	Torx Bit	Grip
TS 40B100I	BT15S	H-TB2W

Square shoulder milling cutters with shred insert

## CUTTER - BORE TYPE

TungTri-Shred TPTC16



Designation	Max. $ap$	$\phi Dc$	$z$	$\phi Db$	$L_f$	$\phi d$	$\ell$	$a$	$b$	Kg	C.bolt	Insert
TPTC16M050B22.0R04	16.0	50.00	4	41	40.0	22.000	20.00	10.40	6.30	0.29	FSHM10-40H	TC*T16
TPTC16M063B22.0R05	16.0	63.00	5	41	40.0	22.000	20.00	10.40	6.30	0.44	CM10X30H	TC*T16
TPTC16J080B25.4R06	16.0	80.00	6	46	50.0	25.400	26.00	9.50	6.00	0.88	CM12X30H	TC*T16
TPTC16M080B27.0R06	16.0	80.00	6	50	50.0	27.000	22.00	12.40	7.00	0.90	CM12X30H	TC*T16
TPTC16J100B31.7R07	16.0	100.00	7	60	50.0	31.750	32.00	12.70	8.00	1.38	TMBA-M16H	TC*T16
TPTC16M100B32.0R07	16.0	100.00	7	60	50.0	32.000	28.50	14.40	8.00	1.35	TMBA-M16H	TC*T16

### SPARE PARTS



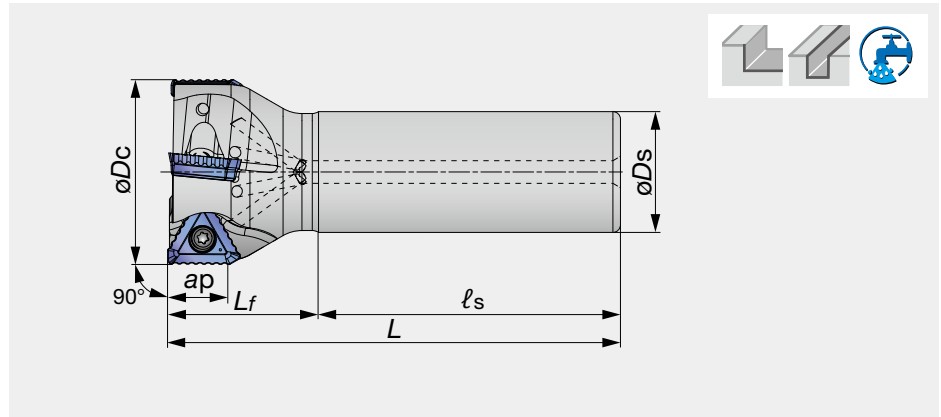
Clamping screw	Wrench	
	Torx Bit	Grip
TS 40B100I	BT15S	H-TB2W



Square shoulder milling cutters with shred insert

## CUTTER - SHANK TYPE

TungTri-Shred EPTC16



Designation	Max. $ap$	$\phi D_c$	$z$	$\phi D_s$	$l_s$	$L_f$	$L$	Kg	Insert
EPTC16M050C32.0R04	16.0	50.00	4	32.0	80.0	40.0	120.0	0.80	TC*T16
EPTC16M050C42.0R02L	16.0	50.00	2	42.0	310.0	50.0	360.0	3.80	TC*T16

### SPARE PARTS

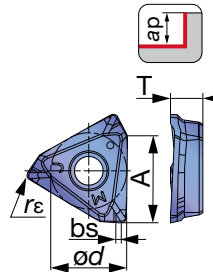


Clamping screw	Torx Bit	Wrench Grip
TS 40B100I	BT15S	H-TB2W

## INSERTS

TCGT-MJ

TCMT-NMJ



Designation	Max. ap	A	ød	T	rε	bs	AH3135	AH120
TCGT160608PDER-MJ	16	16	13.7	5.8	0.8	1	● ● ● ●	○ ● ●
TCMT160620PDER-NMJ	16	16	13.3	5.8	2	2	● ● ● ●	○ ● ●

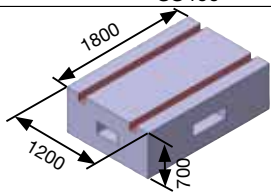
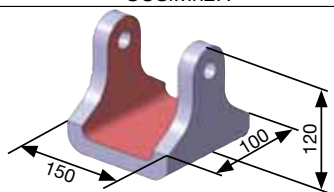
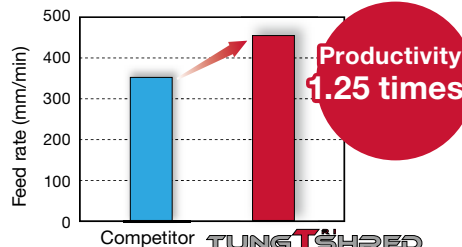
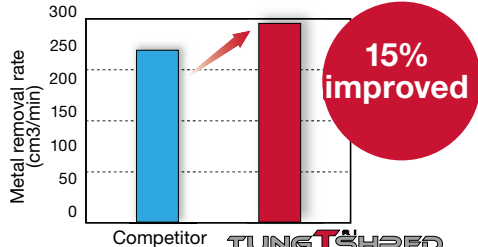
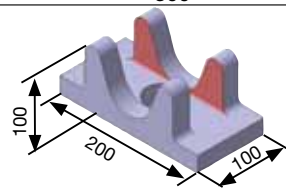
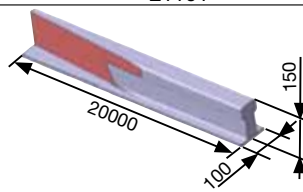
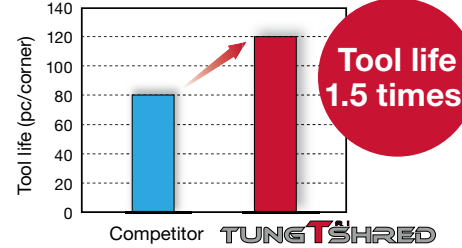
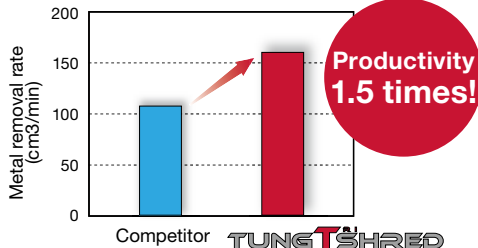
● First choice

## STANDARD CUTTING CONDITIONS

ISO	Workpiece materials	Hardness	Priority	Grades	Chip-breaker	Cutting speed Vc (m/min)	Feed per tooth fz (mm/t)
P	Low carbon steel (C15, C20, etc.)	- 300 HB	First choice	AH3135	NMJ*	100 - 250	0.08 - 0.15
		- 300 HB	For finishing	AH3135	MJ	100 - 250	0.08 - 0.2
	Carbon steel and alloy steel (S55C / C55, SCM440 / 42CrMo4, etc.)	- 300 HB	First choice	AH3135	NMJ*	100 - 230	0.08 - 0.15
		- 300 HB	For finishing	AH3135	MJ	100 - 230	0.08 - 0.2
Prehardened steel (NAK80, PX5, etc.)	30 - 40 HRC	First choice	AH3135	NMJ*	100 - 180	0.08 - 0.15	
	30 - 40 HRC	For finishing	AH3135	MJ	100 - 180	0.08 - 0.2	
M	Stainless steel (SUS304 / X5CrNi18-9, SUS316 / X5CrNiMo17-12-3, etc.)	-	First choice	AH3135	NMJ*	90 - 200	0.08 - 0.15
		-	For finishing	AH3135	MJ	90 - 200	0.08 - 0.2
K	Grey cast iron (FC250 / 250, FC300 / 300, etc.)	150 - 250 HB	First choice	AH120	NMJ*	140 - 250	0.08 - 0.15
		150 - 250 HB	For finishing	AH120	MJ	140 - 250	0.08 - 0.25
	Ductile cast iron (400-15, FCD600 / 600-3, etc.)	150 - 250 HB	First choice	AH120	NMJ*	140 - 250	0.08 - 0.15
		150 - 250 HB	For finishing	AH120	MJ	140 - 250	0.08 - 0.25
S	Titanium alloys (Ti-6Al-4V, etc.)	-	First choice	AH120	NMJ*	20 - 60	0.08 - 0.15
		-	For finishing	AH120	MJ	20 - 60	0.08 - 0.18
	Heat-resistant alloys (Inconel718, etc.)	-	First choice	AH120	NMJ*	20 - 40	0.08 - 0.13
		-	For finishing	AH120	MJ	20 - 40	0.08 - 0.15

\* When you use the NMJ chipbreaker, please set up the feed less than 0.15 mm/t.

## PRACTICAL EXAMPLES

Workpiece type	Machine parts	Bracket	
<b>Holder</b>	LPTC16J063B25.4L061R03 (ø63, z = 3)	LPTC16M080B32.0L076R04 (ø80, z = 4)	
<b>Insert</b>	TCMT160620PDER-NMJ	TCMT160620PDER-NMJ	
<b>Grade</b>	AH3135 SS400	AH3135 SCSiMn2H	
<b>Workpiece material</b>	 <b>P</b>	 <b>P</b>	
<b>Cutting conditions</b>	<b>Cutting speed: Vc (m/min)</b>	150 (Competitor: Vc = 105)	135 (Competitor: Vc = 126)
	<b>Feed per tooth: fz (mm/t)</b>	0.2	0.33 (Competitor: fz = 0.3)
	<b>Feed speed: Vf (m/min)</b>	455	709
	<b>Depth of cut: ap (mm)</b>	50	75
	<b>Width of cut: ae (mm)</b>	10	5
	<b>Method of machining</b>	Shoulder milling	Shoulder milling
	<b>Coolant</b>	Air	Air
<b>Machine</b>	Tower M/C, BT50	Vertical M/C, BT40	
<b>Results</b>	 <p><b>Productivity 1.25 times!</b></p> <p>Lower cutting force of TungTri-Shred allows increasing the cutting speed by 25% and eventually achieving high productivity.</p>	 <p><b>15% improved</b></p> <p>The cutting force of TungTri-Shred is lower than competitors, allowing productivity improvement of 15%. This reduces customer's process cost.</p>	
Workpiece type	Flange	Rail	
<b>Holder</b>	TPTC16M050B22.0R04 (ø50, z = 4)	LPTC16M080B32.0L076R04 (ø80, z = 4)	
<b>Insert</b>	TCMT160620PDER-NMJ	TCGT160608PDER-MJ	
<b>Grade</b>	AH120 300	AH120 E1101	
<b>Workpiece material</b>	 <b>P</b>	 <b>P</b>	
<b>Cutting conditions</b>	<b>Cutting speed: Vc (m/min)</b>	150	125 (Competitor: Vc = 57)
	<b>Feed per tooth: fz (mm/t)</b>	0.18	0.15
	<b>Feed speed: Vf (m/min)</b>	700	240
	<b>Depth of cut: ap (mm)</b>	2	45
	<b>Width of cut: ae (mm)</b>	10	15
	<b>Method of machining</b>	Shoulder milling	Shoulder milling
	<b>Coolant</b>	Wet	Air
<b>Machine</b>	Horizontal M/C, BT40	Tower M/C, BT50	
<b>Results</b>	 <p><b>Tool life 1.5 times!</b></p> <p>Smaller chip size and reduced cutting forces improves tool life by 1.5 times.</p>	 <p><b>Productivity 1.5 times!</b></p> <p>Cutting sound and forces were low allowing increase of cutting speed and subsequently improving productivity. Wall surface finish achieved with MJ insert was very good.</p>	

### 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.

3726 N Ventura Drive  
Arlington Heights, IL 60004, U.S.A.  
Phone: +1-888-554-8394  
Fax: +1-888-554-8392  
www.tungaloyamerica.com

### Tungaloy Canada

432 Elgin St. Unit 3  
Brantford, Ontario N3S 7P7, Canada  
Phone: +1-519-758-5779  
Fax: +1-519-758-5791  
www.tungaloy.co.jp/ca

### Tungaloy de Mexico S.A.

C Los Arellano 113,  
Parque Industrial Siglo XXI  
Aguascalientes, AGS, Mexico 20290  
Phone: +52-449-929-5410  
Fax: +52-449-929-5411  
www.tungaloy.co.jp/mx

### Tungaloy do Brasil Ltda.

Avd. Independencia N4158 Residencial Flora  
13280-000 Vinhedo, São Paulo, Brasil  
Phone: +55-19-38262757  
Fax: +55-19-38262757  
www.tungaloy.com/br

### Tungaloy Germany GmbH

An der Alten Ziegelei 1  
D-40789 Monheim, Germany  
Phone: +49-2173-90420-0  
Fax: +49-2173-90420-19  
www.tungaloy.de

### Tungaloy France S.A.S.

ZA Courtaboeuf - Le Rio  
1 rue de la Terre de feu  
F-91952 Courtaboeuf Cedex, France  
Phone: +33-1-6486-4300  
Fax: +33-1-6907-7817  
www.tungaloy.fr

### Tungaloy Italia S.r.l.

Via E. Andolfato 10  
I-20126 Milano, Italy  
Phone: +39-02-252012-1  
Fax: +39-02-252012-65  
www.tungaloy.it

### Tungaloy Czech s.r.o.

Turanka 115  
CZ-627 00 Brno, Czech Republic  
Phone: +420-532 123 391  
Fax: +420-532 123 392  
www.tungaloy.cz

### Tungaloy Ibérica S.L.

C/Miquel Servet, 43B, Nau 7  
Pol. Ind. Bufalvent  
ES-08243 Manresa (BCN), Spain  
Phone: +34 93 113 1360  
Fax: +34 93 876 2798  
www.tungaloy.es

### Tungaloy Scandinavia AB

Bultgatan 38  
442 40 Kungälv, Sweden  
Phone: +46-462119200  
www.tungaloy.se

### Tungaloy Rus, LLC

Andropova avenue, h.18/7,  
11 floor, office 3, 115432,  
Moscow, Russia  
Phone: +7-499-683-01-80  
Fax: +7-499-683-01-81  
www.tungaloy.co.jp/ru

### Tungaloy East LLC

Stachek str., h.4, office 2, Ekaterinburg,  
620017, Russia  
Phone: +7-343-389-13-22  
Fax: +7-343-278-94-35  
www.tungaloy.co.jp/rue

### Tungaloy Polska Sp. z o.o.

ul. Genevska 24  
03-963 Warszawa, Poland  
Phone: +48-22-617-0890  
Fax: +48-22-617-0890  
www.tungaloy.co.jp/pl

### Tungaloy U.K. Ltd

The Technology Centre,  
Wolverhampton Science Park  
Glaisher Drive, Wolverhampton  
West Midlands WV10 9RU, UK  
Phone: +44 121 4000 231  
Fax: +44 121 270 9694  
www.tungaloy.co.jp/uk  
salesinfo@tungaloyuk.co.uk

### Tungaloy Hungary Kft

Erzsébet királyné útja 125  
H-1142 Budapest, Hungary  
Phone: +36 1 781-6846  
Fax: +36 1 781-6866  
www.tungaloy.co.jp/hu  
info@tungaloytools.hu

### Tungaloy Turkey

Dudullu, OSB 4. Cad No:4  
34776 Umraniye Istanbul, TURKEY  
Phone: +90 216 540 04 67  
Fax: +90 216 540 04 87  
www.tungaloy.com.tr  
info@tungaloy.com.tr

### Tungaloy Benelux b.v.

Tjalk 70  
NL-2411 NZ Bodegraven, Netherlands  
Phone: +31 172 630 420  
Fax: +31 172 630 429  
www.tungaloy-benelux.com

### Tungaloy Croatia

Josipa Kozarca 4  
10432 Bregana, Croatia  
Phone: +385 1 3326 604  
Fax: +385 1 3327 683  
www.tungaloy.hr

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

Rm No 401 No.88 Zhabei  
Jiangchang No.3 Rd  
Shanghai 200436, China  
Phone: +86-21-3632-1880  
Fax: +86-21-3621-1918  
www.tungaloy.co.jp/tcts

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

Interlink tower 4th Fl.  
1858/5-7 Bangna-Trad Road  
km.5 Bangna, Bangna, Bangkok 10260  
Thailand  
Phone: +66-2-751-5711  
Fax: +66-2-751-5715  
www.tungaloy.co.th

### Tungaloy Singapore (Pte.), Ltd.

62 Ubi Road 1, #06-11 Oxley BizHub 2  
Singapore 408734  
Phone: +65-6391-1833  
Fax: +65-6299-4557  
www.tungaloy.co.jp/tspl

### Tungaloy Vietnam

LE 04-38, Lexington Residence  
67 Mai Chi Tho, Dist. 2,  
Ho Chi Minh City, Vietnam  
Phone: +84-8-37406660  
Fax: +84-8-37406662  
www.tungaloy.co.jp/tspl

### Tungaloy India Pvt. Ltd.

Indiabulls Finance Centre,  
Unit # 902-A, 9th Floor,  
Tower 1, Senapati Bapat Marg,  
Elphinstone Road (West),  
Mumbai -400013, India  
Phone: +91-22-6124-8804  
Fax: +91-22-6124-8899  
www.tungaloy.co.jp/in

### Tungaloy Korea Co., Ltd

#1312, Byucksan Digital Valley 5-cha  
Beotkkot-ro 244, Geumcheon-gu  
153-788 Seoul, Korea  
Phone: +82-2-2621-6161  
Fax: +82-2-6393-8952  
www.tungaloy.co.jp/kr

### Tungaloy Malaysia Sdn Bhd

50 K-2, Kelana Mall, Jalan SS6/14  
Kelana Jaya, 47301  
Petaling Jaya, Selangor Darul Ehsan  
Malaysia  
Phone: +603-7805-3222  
Fax: +603-7804-8563  
www.tungaloy.co.jp/my

### Tungaloy Australia Pty Ltd

PO Box 2232, Rowville,  
Victoria 3178, Australia  
Phone: +61-3-9755-8147  
Fax: +61-3-9755-6070  
www.tungaloy.com.au

### PT. Tungaloy Indonesia

Kompleks Grand Wisata Block AA-10 No.3-5  
Cibitung  
Bekasi 17510, Indonesia  
Phone: +62-21-8261-5808  
Fax: +62-21-8261-5809  
www.tungaloy.co.jp/id



www.tungaloy.com

follow us at:

facebook.com/tungaloyjapan

twitter.com/tungaloyjapan

To see this product in action visit:

# Tung-TV

www.youtube.com/tungaloycorporation

Distributed by:



DOWNLOAD  
Dr. Carbide  
Tungaloy



Available on the  
App Store



GET IT ON  
Google play



ISO 9001 Certified  
QC00J0056  
Tungaloy Corporation  
18/10/1996

ISO 14001 Certified  
EC97J1123  
Tungaloy Group  
Japan site and Asian  
production site  
26/11/1997