

Tungaloy

Member IMC Group

Keeping the Customer First

Tungaloy Report No. 394-US

TURNLINE Turning tool for roughing operations

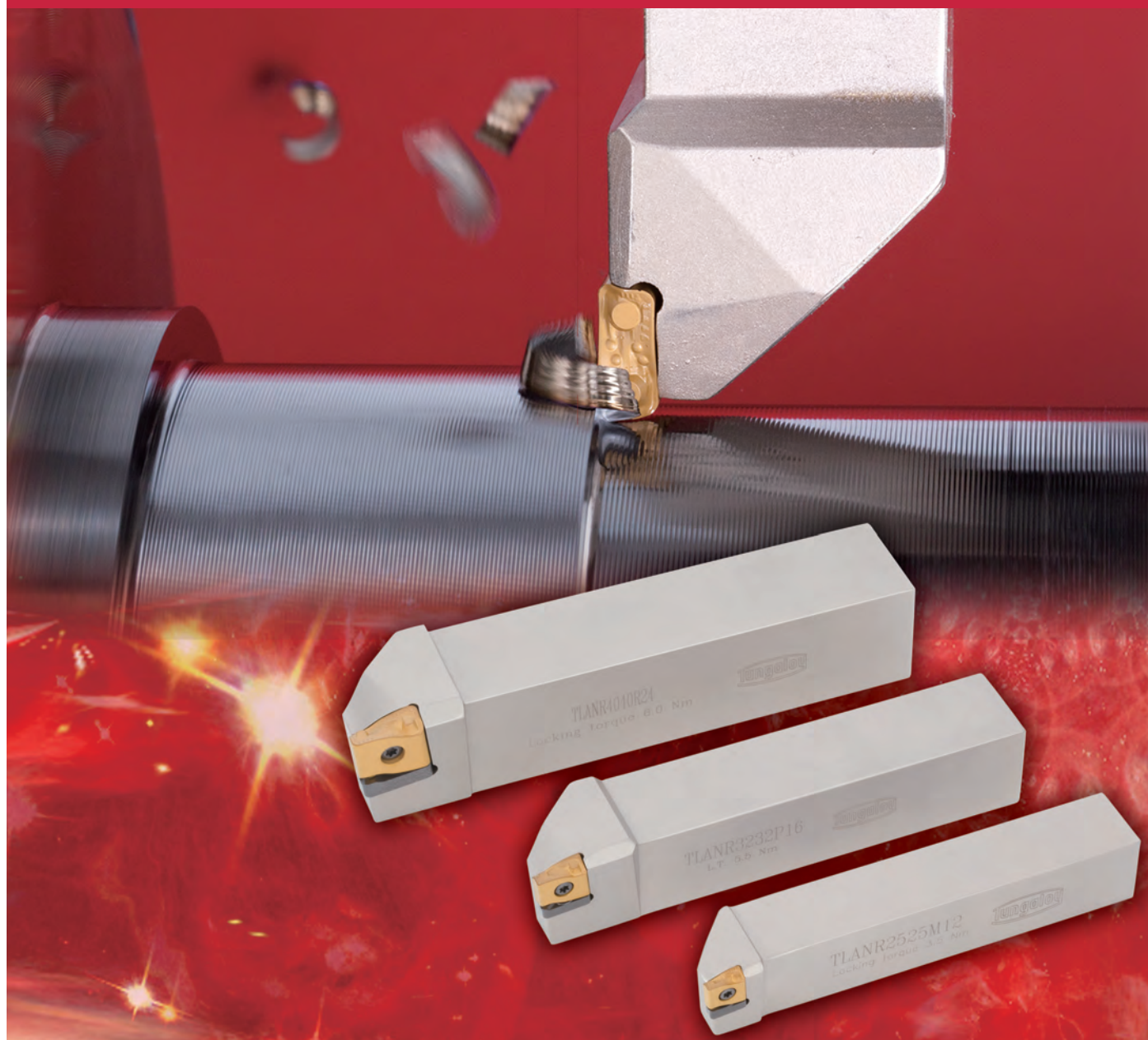
Extended version

TURNTEC

TL type

PREMIUMTEC
TUNGALOY

Cutting-edge technology provides maximum productivity



Features

● Optimal solutions for high productivity rough machining!

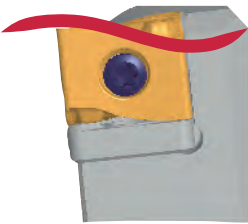
Strong insert for large depth of cut and scaled surface machining

Long curved cutting edge



Smooth chip evacuation
Low cutting force

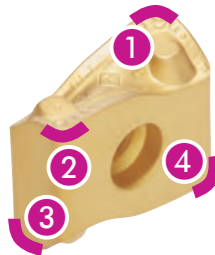
Large inclination
on the cutting edge



Highly economical
Excellent chipping resistance

4 corners
available

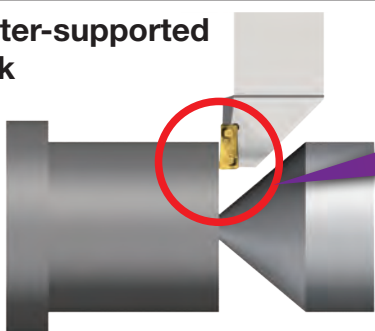
Thick insert that is
tangentially clamped



■ Suitable for center-supported work

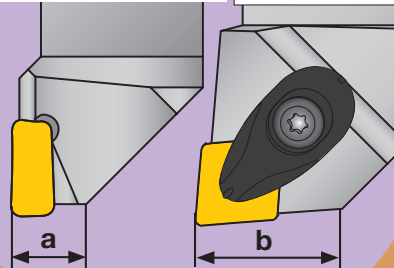
High accessibility to center-supported work
compared with conventional toolholders

Center-supported
work



TURNTEC

Conventional
toolholder



$a < b$

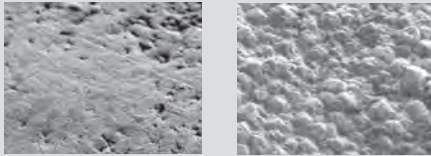
Grades

Special Surface Technology

PREMIUMTEC

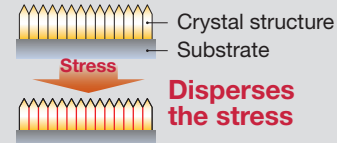
Smooth insert surface prevents chip adhesion and improves chip flow.

■ Comparison of coated surfaces
T9100 SERIES Conventional type



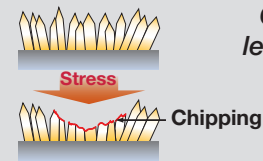
Columnar Stabilization Technology

T9100 SERIES



Prevents randomly developed cracks!!
Excellent fracture resistance & extended tool life!

Conventional



Growing cracks leads to peeling of the coating

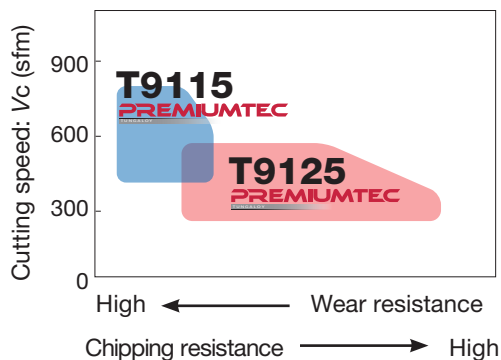
Adhesion Reinforcement Technology

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)	T.R.S. (GPa)	Main Composition	Thickness (μm)		
P Steel	T9115	13.9	91	2.5	Continuously formed columnar crystal TiCN + Al ₂ O ₃	16	Highly stable grades for steel turning Special Surface Technology PREMIUMTEC 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 M10-M20							
M Stainless	T9125	13.7	90	2.6	Continuously formed columnar crystal TiCN + Al ₂ O ₃	16		
	P20-P30 M20-M30							
M Stainless	AH725	14.4	91.5	3	“Flash -Coating” (Ti, Al)N base	2		General grade Special Surface Technology PREMIUMTEC General grade PVD “Flash-Coating” fine grain cemented carbide.
	M20-M30							

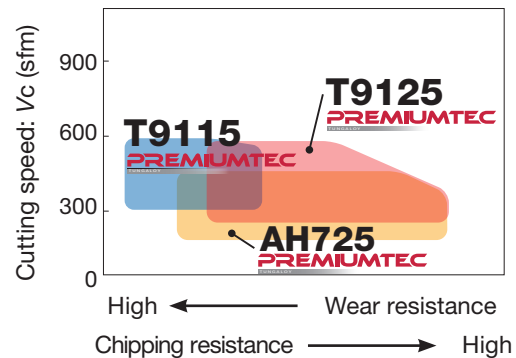
Application range

Steel machining



P
Steel

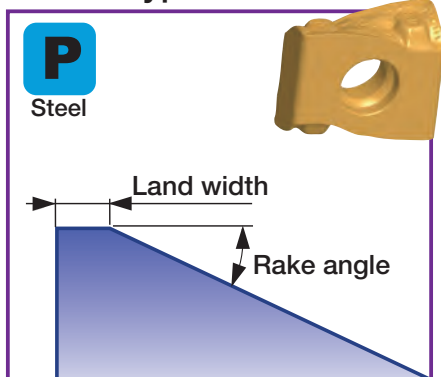
Stainless steel machining



M
Stainless

Chipbreakers

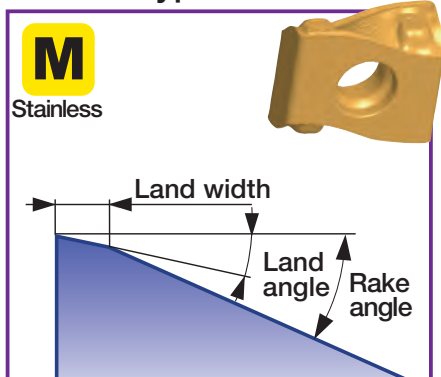
TDR type



For steel turning

- Excellent balance of low cutting force and edge strength

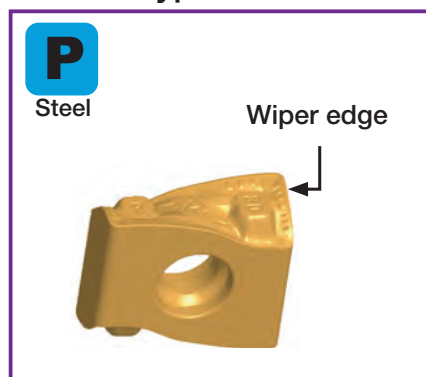
MDR type



For stainless steel turning

- Strong for stainless steel machining with sharp cutting edge

TWR type



With wiper edge

- Improves surface finish

Inserts

Cat. No.	Grades						Dimensions (in)			
	Coated						W	L	h	r _ε
	T9115		T9125		AH725					
	R	L	R	L	R	L				
TDR Chipbreaker										
LNMX120408R/L-TDR	●	●	●	●			.189	.473	.457	.031
LNMX120412R/L-TDR	●	●	●	●			.189	.473	.457	.047
LNMX160608R/L-TDR	●	●	●	●			.252	.638	.532	.031
LNMX160612R/L-TDR	●	●	●	●			.252	.638	.532	.047
LNMX160616R/L-TDR	●	●	●	●			.252	.638	.532	.063
LNMX241016R/L-TDR	●	●	●	●			.370	.945	.807	.063
LNMX241024R/L-TDR	●	●	●	●			.370	.945	.807	.094
MDR Chipbreaker										
LNMX160608R/L-MDR	●	●			○	○	.252	.638	.532	.031
LNMX160612R/L-MDR	●	●			●	○	.252	.638	.532	.047
TWR Chipbreaker										
LNMX120408R/L-TWR	○	○	○	○			.189	.473	.457	.031
LNMX120412R/L-TWR	○	○	○	○			.189	.473	.457	.047
LNMX160608R/L-TWR	●	●	●	●			.252	.638	.532	.031
LNMX160612R/L-TWR	●	●	●	●			.252	.638	.532	.047

Technical drawing of a yellow chipbreaker. The top view shows a rectangular shape with rounded corners and a central circular hole. Dimensions L (length) and W (width) are indicated. The side view shows the profile of the chipbreaker, with dimension h (height) and r_ε (radius of curvature) indicated.

Right hand (R) shown.

Right hand (R) shown.

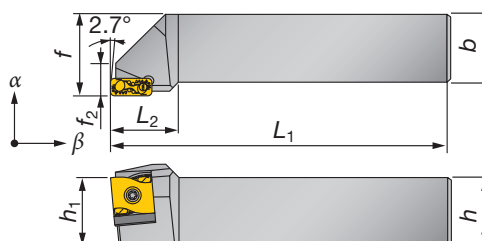
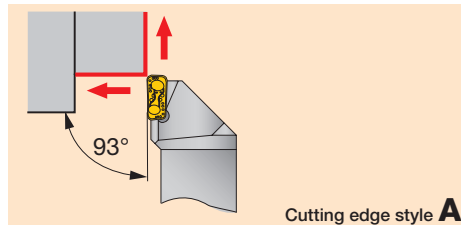
● : Stocked items
○ : Japan Stocked Item

External toolholders

TLAN R/L

External Turning & Facing

T-type (Negative rake, Screw-on system)



Right hand (R) shown.

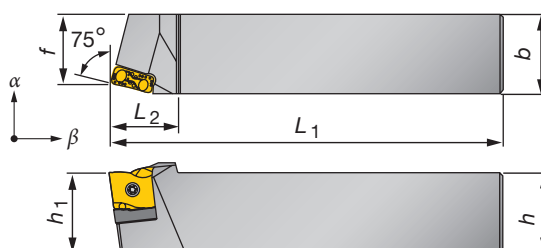
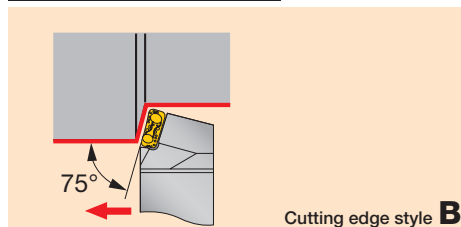
Cat. No.	Stock		Dimensions (in)									Inserts
	R	L	h	b	L ₁	L ₂	f ₂	h ₁	f	α	β	
TLANR/L10-12	●	●	.625	.625	4.000	.790	.470	.625	.750	-6°	-6°	LNMX1204□□R/L-□□R
TLANR/L12-12	●	●	.750	.750	4.500	.790	.470	.750	1.000	-6°	-6°	
TLANR/L16-12	●	●	1.000	1.000	6.000	.790	.470	1.000	1.250	-6°	-6°	
TLANR/L12-16	●	●	.750	.750	4.500	1.000	.550	.750	1.000	-6°	-6°	LNMX1606□□R/L-□□R
TLANR/L16-16	●	●	1.000	1.000	6.000	1.000	.550	1.000	1.180	-6°	-6°	
TLANR/L20-16	●	●	1.250	1.250	6.000	1.380	.550	1.250	1.460	-6°	-6°	
TLANR/L24-16	●	●	1.500	1.500	7.000	1.380	.550	1.500	1.700	-6°	-6°	LNMX2410□□R/L-□□R
TLANR/L20-24	●	●	1.250	1.250	6.000	1.380	.787	1.250	1.500	-6°	-6°	
TLANR/L24-24	●	●	1.500	1.500	7.000	1.380	.787	1.500	1.700	-6°	-6°	
TLANR/L32-24	●	●	2.000	2.000	8.000	1.380	.787	2.000	2.275	-6°	-6°	

*The right hand insert (R) is used in right hand toolholders (TLANR □□ type), and the left hand insert (L) is used for the left hand toolholders (TLANL □□ type).

TLBN R/L

External Turning

T-type (Negative rake, Screw-on system)



Right hand (R) shown.

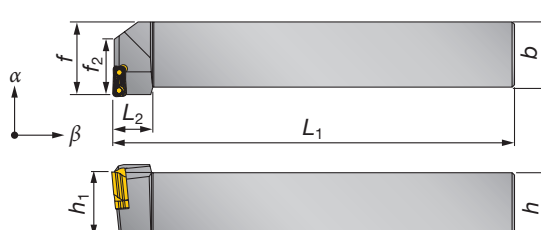
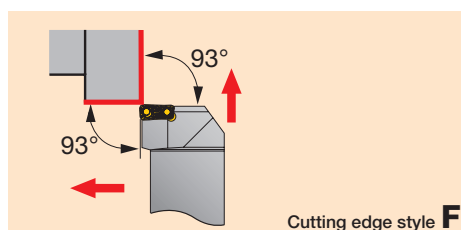
Cat. No.	Stock		Dimensions (in)									Inserts
	R	L	h	b	L ₁	L ₂	f ₂	h ₁	f	α	β	
TLBNR/L24-24	●	●	1.500	1.500	8.000	1.380	-	1.500	1.380	-7.4°	-4.3°	LNMX2410□□R/L-□□R

*The right hand insert (R) is used in right hand toolholders (TLBNR □□ type), and the left hand insert (L) is used for the left hand toolholders (TLBNL □□ type).

TLFN R/L

Facing & External Turning

T-type (Negative rake, Screw-on system)



Right hand (R) shown.

Cat. No.	Stock		Dimensions (in)									Inserts
	R	L	h	b	L ₁	L ₂	f ₂	h ₁	f	α	β	
TLFNR/L16-16	●	●	1.000	1.000	6.000	.780	.920	1.000	1.000	-6°	-6°	LNMX1606□□L/R-□□R
TLFNR/L20-16	●	●	1.250	1.250	6.000	.780	.920	1.250	1.000	-6°	-6°	

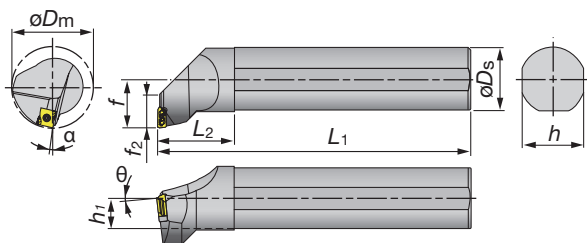
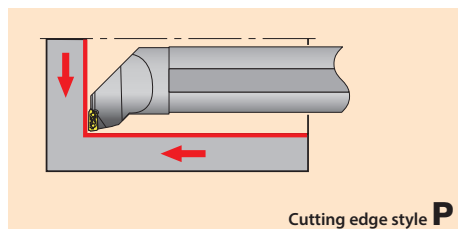
*The right hand insert (R) is used for the left hand toolholders (TLFNL □□ type), and the left hand insert (L) is used for the right hand toolholders (TLFNR □□ type).

● : Stocked items

Internal toolholders

S-TLAN R/L Internal Turning & Facing

T-type (Negative rake, Screw-on system)



Right hand (R) shown.

Cat. No.	Stock		Min bore dia. ϕD_m	Dimensions (in)							α	θ	Inserts
	R	L		ϕD_s	f	L_1	L_2	f_2	h	h_1			
S16 TLANR/L12-D34	●	●	2.090	1.000	.670	12.000	1.500	.866	.920	.460	-6°	-14°	LNMX1204□□L/R-□□R
S20 TLANR/L12-D34	●	●	2.090	1.250	.870	14.000	1.750	.866	1.140	.570	-6°	-14°	
S24 TLANR/L12-D34	●	●	2.090	1.500	1.060	16.000	2.000	.866	1.340	.670	-6°	-14°	
S32 TLANR/L16-D54	●	●	3.350	2.000	1.460	16.000	2.360	.866	1.810	.905	-6°	-10°	LNMX1606□□L/R-□□R

*The right hand insert (R) is used for the left hand toolholders (S-TLANL □□ type), and the left hand insert (L) is used for the right hand toolholders (S-TLANR □□ type).

● : Stocked items

Replacement parts

Cat. No.	Insert	Shim	Shim screw	Spring pin	Wrench for shim screw	Clamp screw	Wrench for clamp screw
				-			
TLANR/L10-12	LNMX1204□□R/L	TSL12R/L	CSTF-2L055-S	-	T-6F-S	CSTB-3.5L115-S	KEYV-T10
TLANR/L12-12							
TLANR/L16-12							
TLANR/L12-16	LNMX1606□□R/L	TSL16R/L	-	PSP-16	-	CSTB-4L115-S	KEYV-T15
TLANR/L16-16							
TLANR/L20-16							
TLANR/L24-16							
TLANR/L20-24	LNMX2410□□R/L	TSL24R/L	-	PSP-16	-	CSTB-5L163-S	KEYV-T20
TLANR/L24-24							
TLANR/L32-24							
TLBNR/L24-24	LNMX2410□□R/L	TSL24R/L	-	PSP-16	-	CSTB-5L163-S	KEYV-T20
TLFNR/L16-16	LNMX1606□□L/R	TSL16L/R	-	PSP-16	-	CSTB-4L115-S	KEYV-T15
TLFNR/L20-16							
S16 TLANR/L12-D34	LNMX1204□□L/R	TSL12L/RI	CSTF-2L055-S	-	T-6F-S	CSTB-3.5L115-S	KEYV-T10
S20 TLANR/L12-D34							
S24 TLANR/L12-D34							
S32 TLANR/L16-D54	LNMX1606□□L/R	TSL16L/RI	-	PSP-16	-	CSTB-4L115-S	KEYV-T15

Standard cutting conditions

LNMX1204□□□-□□□

* Values in red show the condition for facing

Work materials	Chip-breakers	Grades	Cutting speed Vc (sfm)	Depth of cut: a_p (in)		Feed: f (ipr)	
				$r_E: .031$	$r_E: .047$	$r_E: .031$	$r_E: .047$
Steels 1045, 4130 etc.	TDR	T9115	390 - 820	.020 - .195	.031 - .195	.006 - .024	.010 - .031
		T9125	260 - 590	.020 - .086	.031 - .086		
	TWR	T9115	390 - 820	.020 - .195	.031 - .195	.006 - .024	.010 - .031
		T9125	260 - 590	.020 - .086	.031 - .086		
Stainless steels 304, 316 etc.	TDR	T9115	330 - 590	.020 - .195	.031 - .195	.006 - .024	.010 - .031
		T9125	260 - 590	.020 - .086	.031 - .086		
	TWR	T9115	330 - 590	.020 - .195	.031 - .195	.006 - .024	.010 - .031
		T9125	260 - 590	.020 - .086	.031 - .086		

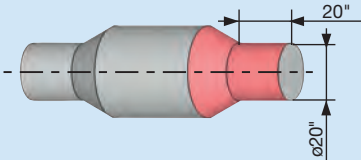
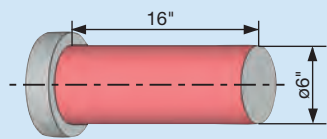
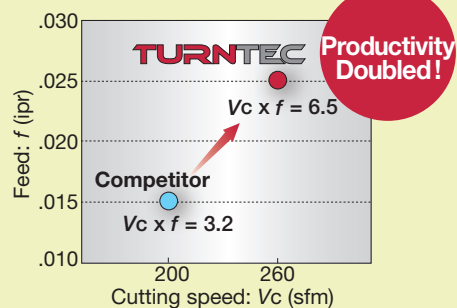
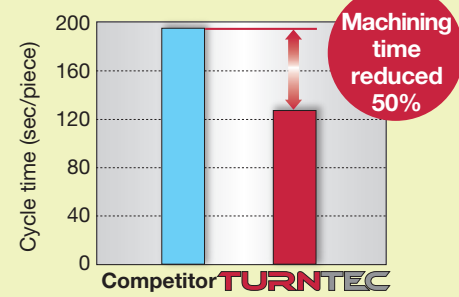
LNMX1606□□□-□□□

Work materials	Chip-breakers	Grades	Cutting speed Vc (sfm)	Depth of cut: a_p (in)			Feed: f (ipr)		
				$r_E: .031$	$r_E: .047$	$r_E: .063$	$r_E: .031$	$r_E: .047$	$r_E: .063$
Steels 1045, 4130 etc.	TDR	T9115	390 - 820	.020 - .197	.031 - .236	.039 - .315	.006 - .024	.010 - .031	.012 - .039
		T9125	260 - 590	.020 - .126	.031 - .126	.039 - .126			
	TWR	T9115	390 - 820	.020 - .197	.031 - .236	-	.006 - .024	.010 - .031	-
		T9125	260 - 590	.020 - .126	.031 - .126	-			
Stainless steels 304, 316 etc.	TDR	T9115	330 - 590	.020 - .197	.031 - .236	.039 - .315	.006 - .024	.010 - .031	.012 - .039
		T9125	260 - 590	.020 - .126	.031 - .126	.039 - .126			
	MDR	T9115	330 - 490	.059 - .236	.059 - .276	-	.004 - .020	.006 - .028	-
		AH725	160 - 490	.020 - .126	.031 - .126	-			
	TWR	T9115	330 - 590	.020 - .197	.031 - .236	-	.006 - .024	.010 - .031	-
		T9125	260 - 590	.020 - .126	.031 - .126	-			

LNMX2410□□□-□□□

Work materials	Chip-breakers	Grades	Cutting speed Vc (sfm)	Depth of cut: a_p (in)		Feed: f (ipr)	
				$r_E: .063$	$r_E: .094$	$r_E: .063$	$r_E: .094$
Steels 1045, 4130 etc.	TDR	T9115	390 - 820	.156 - .585	.195 - .585	.012 - .039	.012 - .043
		T9125	260 - 490	.039 - .176	.039 - .176		
Stainless steels 304, 316 etc.	TDR	T9115	330 - 590	.156 - .585	.195 - .585	.012 - .039	.012 - .043
		T9125	260 - 490	.039 - .176	.039 - .176		

Practical examples

Workpiece type		Shaft	Shaft
Toolholder		TLANR20-16	TLANR20-16
Insert		LNMX160612R-TDR	LNMX160616R-TDR
Grade		T9125	T9125
Work material		(4140) Alloy steel	(1045) (200HB)
			
Cutting conditions	Cutting speed : Vc (sfm)	260	490
	Feed : f (ipr)	.025	.025
	Depth of cut : ap (in)	.200	.300
	Machining	External roughing operation	External roughing operation
	Coolant	Dry	Dry
Results		 The TDR insert with a deep inclination provides stable machining without chattering, even when feed is increased by 1.5.	 Even with a large D.O.C, the TDR insert enables higher feed machining compared to conventional ISO inserts with pressed chipbreakers.



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



Scan for instant web access



Distributed by:

Feb. 2014 (TA)