Tungaloy
Member IMC Group

Keeping the Customer First

Tungaloy Report No. 394-E

TURNLINE Turning tool for roughing operations

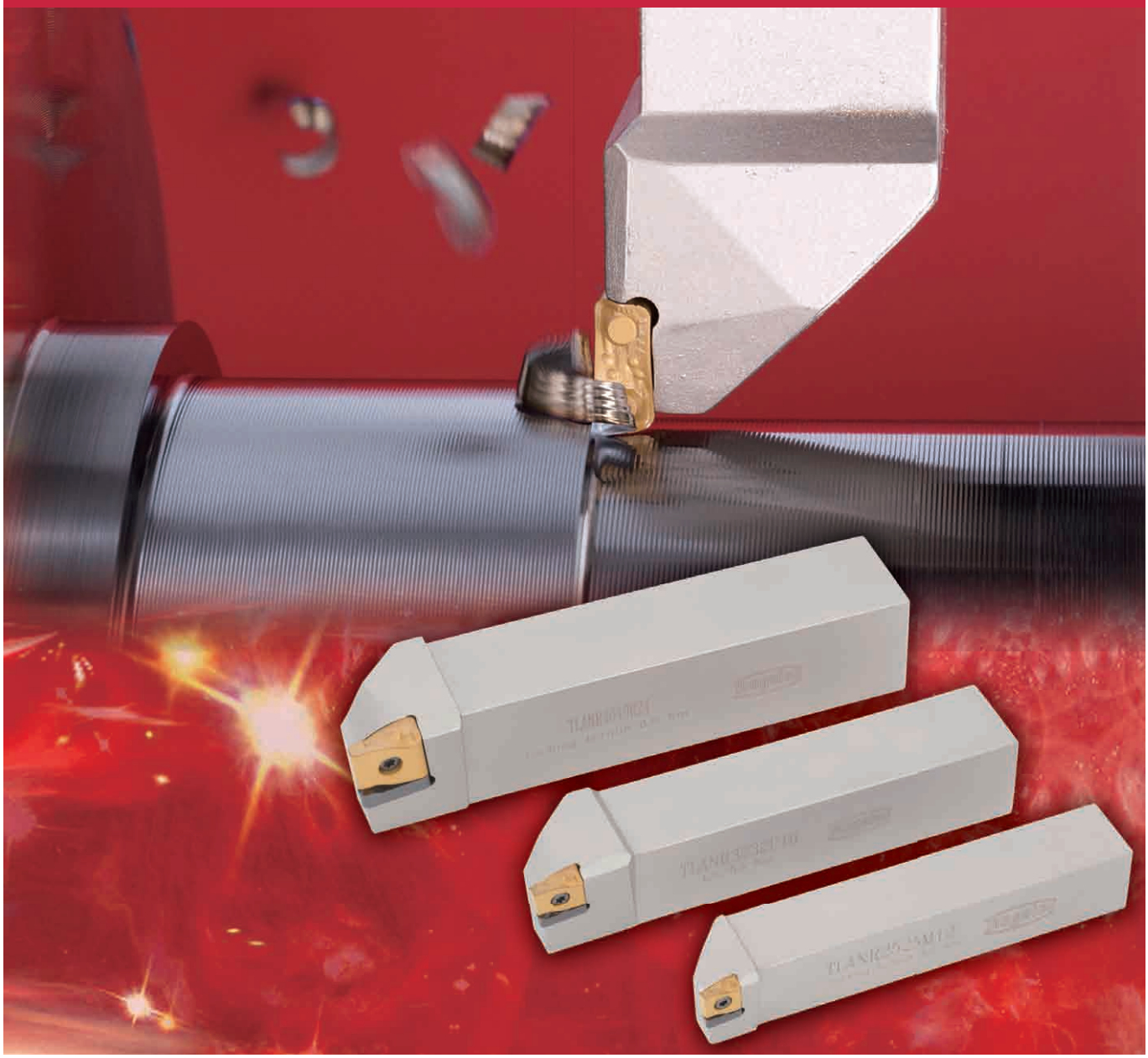
TURNTEC

TL type

Extended version with items

PREMIUMTEC
TUNGALOY

Cutting-edge technology provides maximum productivity

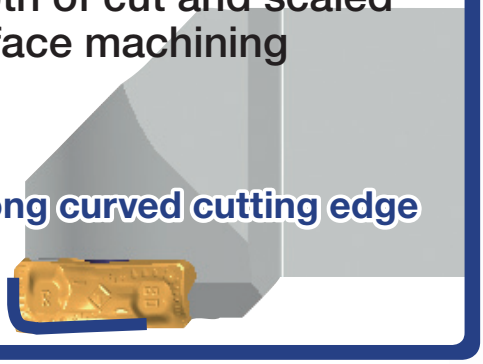


Features

Optimal solution for high productivity rough machining !

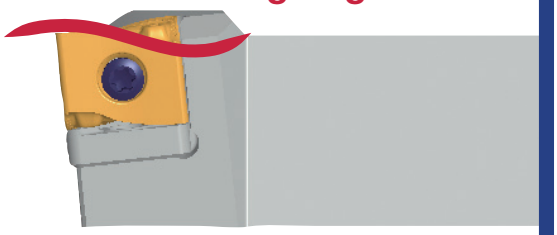
Strong insert for large depth of cut and scaled surface machining

Long curved cutting edge



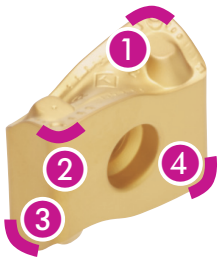
Smooth chip evacuation Low cutting force

Large inclination on the cutting edge

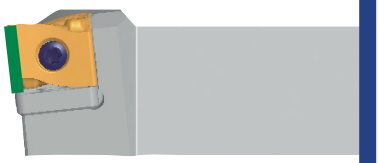


Highly economical Excellent chipping resistance

4 corners available



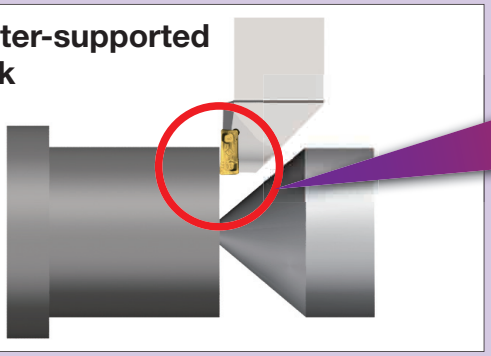
Thick insert that is tangentially clamped

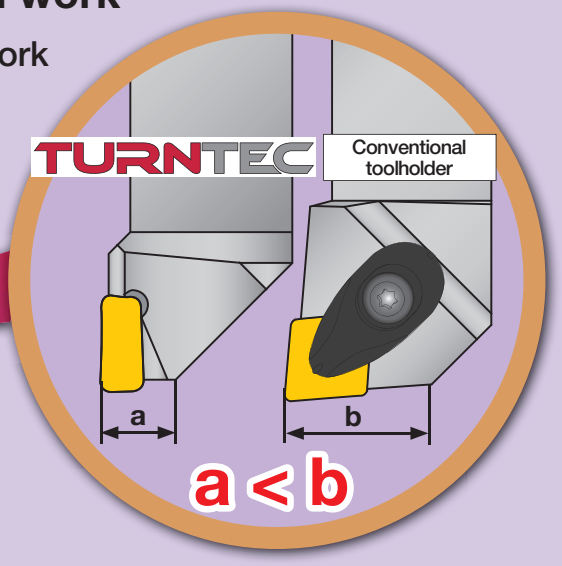


Suitable for center-supported work

High accessibility to center-supported work compared with conventional toolholders

Center-supported work





Grades

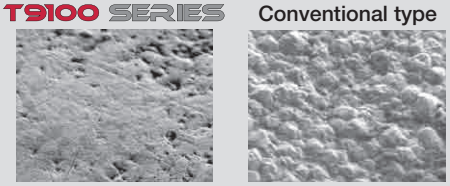
Special Surface Technology

PREMIUMTEC TUNGALOY

Smooth insert surface prevents chip adhesion and improves chip flow.

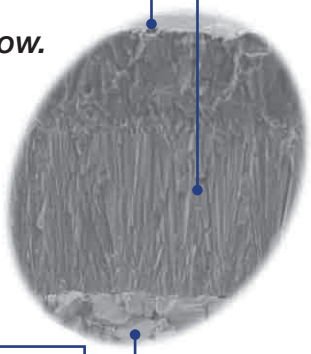
■ Comparison of coated surfaces

T9100 SERIES | Conventional type



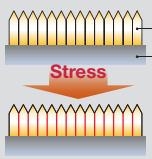
Adhesion Reinforcement Technology

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



Columnar Stabilization Technology

■ T9100 SERIES



Disperses the stress

Prevents randomly developed cracks !!

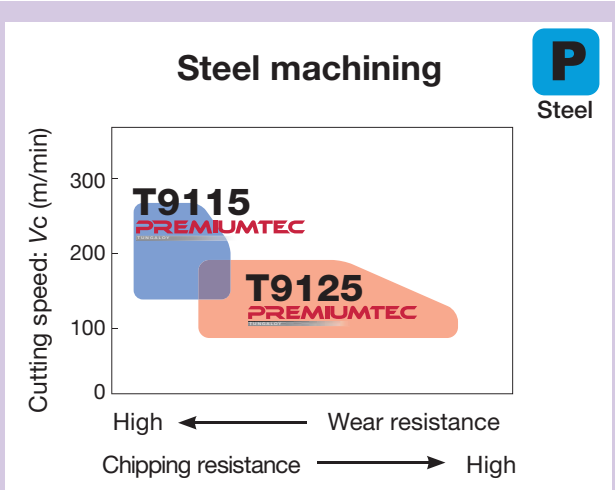
Excellent fracture resistance & extended tool life!

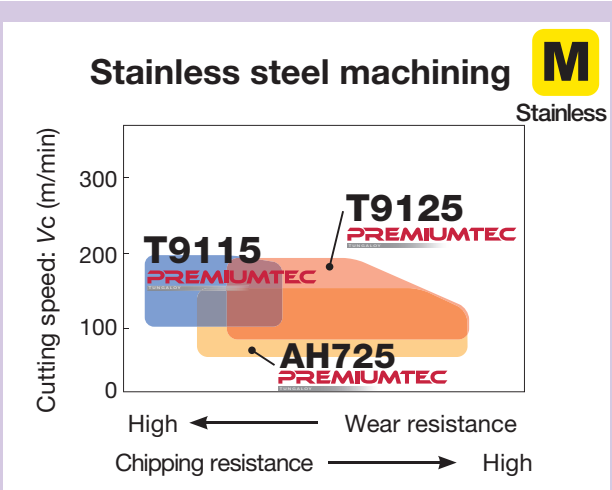
■ Conventional

Growing cracks leads to the peeling off the coating

Appli-cation	Grade	Substrate			Coating layer		Features
	Application code	Specific gravity	Hardness (HRA)	T.R.S. (GPa)	Main Composition	Thickness (μm)	
P Steel M Stainless	**T9115** P10-P20 M10-M20	13.9	91	2.5	Continuously formed columnar crystal TiCN + Al_2O_3	16	**Highly stable grade 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.
	T9125 P20-P30 M20-M30	13.7	90	2.6	Continuously formed columnar crystal TiCN + Al_2O_3	16	
M Stainless	**AH725** M20-M30	14.4	91.5	3	"Flash -Coating" (Ti, Aℓ)N base	2	**General grade** *Special Surface Technology* PREMIUMTEC General grade that is "Flash-Coating" with a fine grain cemented carbide.

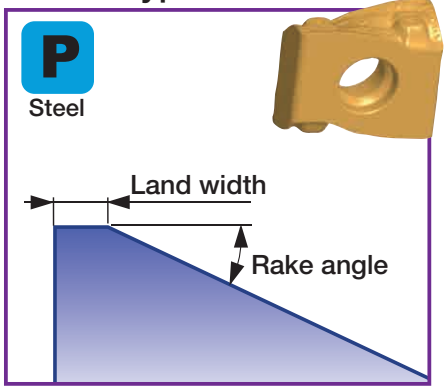
Application range





Chipbreakers

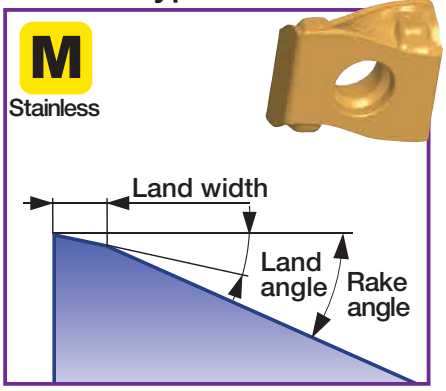
TDR type



For steel turning

- Excellent balance of low cutting force and edge strength

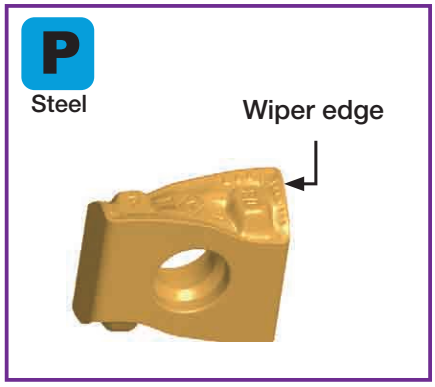
MDR type



For stainless steel turning

- Strong for stainless steel machining with sharp cutting edge

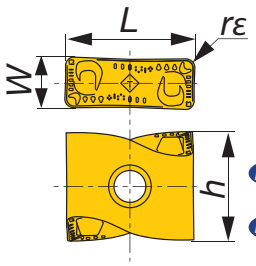
TWR type



With wiper edge

- Improves surface finish

Inserts



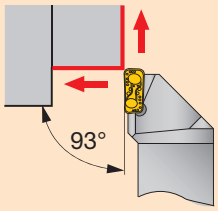
Right hand (R) shown.

	Cat. No.	Grades						Dimensions (mm)			
		Coated									
		T9115		T9125		AH725		W	L	h	rε
		R	L	R	L	R	L				
New	LNMX120408R/L-TDR	●	●	●	●			4.8	12.0	11.6	0.8
New	LNMX120412R/L-TDR	●	●	●	●			4.8	12.0	11.6	1.2
	LNMX160608R/L-TDR	●	●	●	●			6.4	16.2	13.5	0.8
	LNMX160612R/L-TDR	●	●	●	●			6.4	16.2	13.5	1.2
	LNMX160616R/L-TDR	●	●	●	●			6.4	16.2	13.5	1.6
New	LNMX241016R/L-TDR	●	★	●	★			9.4	24.0	20.5	1.6
New	LNMX241024R/L-TDR	●	★	●	★			9.4	24.0	20.5	2.4
	LNMX160608R/L-MDR	●	●			★	★	6.4	16.2	13.5	0.8
	LNMX160612R/L-MDR	★	★			★	★	6.4	16.2	13.5	1.2
New	LNMX120408R/L-TWR	★	★	★	★			4.8	12.0	11.6	0.8
New	LNMX120412R/L-TWR	★	★	★	★			4.8	12.0	11.6	1.2
	LNMX160608R/L-TWR	★	★	★	★			6.4	16.2	13.5	0.8
	LNMX160612R/L-TWR	★	★	★	★			6.4	16.2	13.5	1.2

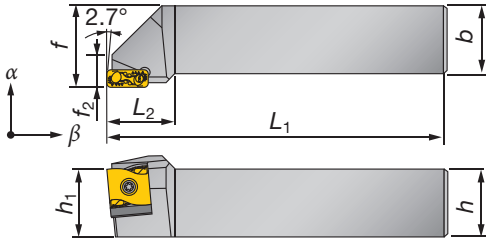
● : Stocked items
★ : Available in 2012

External toolholders

TLAN R/L External Turning & Facing T-type (Negative rake, Screw-on system)



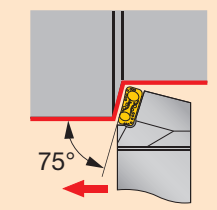
Cutting edge style **A**



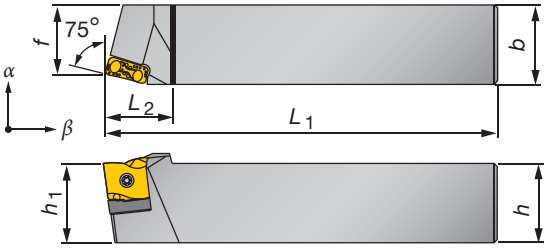
Right hand (R) shown.

Cat. No.	Stock		Dimensions (mm)									Inserts
	R	L	*h*	*b*	L_1	L_2	f_2	h_1	*f*	α	β	
New TLANR/L1616H12	●	●	16	16	100	20	12	16	20	-6°	-6°	LNMX1204□□R/L-□□R
New TLANR/L1616M12S	●	●	16	16	150	20	12	16	20	-6°	-6°	
New TLANR/L2020K12	●	●	20	20	125	20	12	20	25	-6°	-6°	
New TLANR/L2525M12	●	●	25	25	150	20	12	25	30	-6°	-6°	
TLANR/L2020K16	●	●	20	20	125	25	14	20	25	-6°	-6°	LNMX1606□□R/L-□□R
TLANR/L2525M16	●	●	25	25	150	25	14	25	30	-6°	-6°	
TLANR/L3232P16	●	●	32	32	170	35	14	32	37	-6°	-6°	
TLANR/L4040R16	●	●	40	40	200	35	14	40	47	-6°	-6°	
New TLANR/L3232P24	●	★	32	32	170	35	20	32	38	-6°	-6°	LNMX2410□□R/L-□□R
New TLANR/L4040R24	●	★	40	40	200	40	20	40	47	-6°	-6°	
New TLANR/L5050S24	●	★	50	50	250	40	20	50	57	-6°	-6°	

TLBN R/L External Turning T-type (Negative rake, Screw-on system)



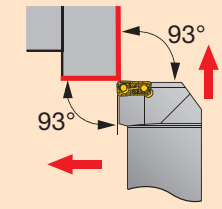
Cutting edge style **B**



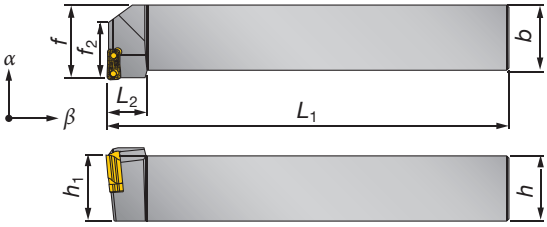
Right hand (R) shown.

Cat. No.	Stock		Dimensions (mm)									Inserts
	R	L	*h*	*b*	L_1	L_2	f_2	h_1	*f*	α	β	
New TLBNR/L4040R24	●	★	40	40	200	35	-	40	35	-7.4°	-4.3°	LNMX2410□□R/L-□□R

TLFN R/L Facing & External Turning T-type (Negative rake, Screw-on system)



Cutting edge style **F**



Right hand (R) shown.

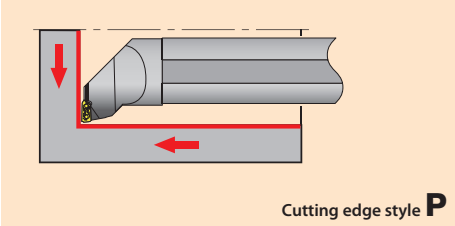
Cat. No.	Stock		Dimensions (mm)									Inserts
	R	L	*h*	*b*	L_1	L_2	f_2	h_1	*f*	α	β	
TLFNR/L2525M16	●	●	25	25	150	20	23	25	30	-6°	-6°	LNMX1606□□L/R-□□R
TLFNR/L3232P16	●	●	32	32	170	20	23	32	37	-6°	-6°	

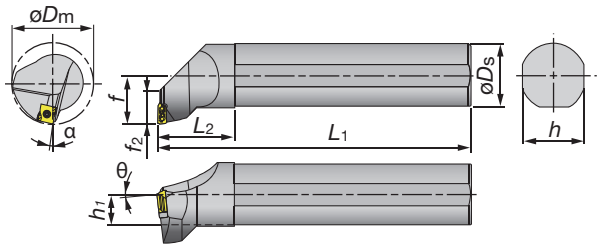
*The right hand insert (R) is used for the left hand toolholders (TLFNL □□ type), and the left hand insert (L) is used for the right hand toolholders (TLFNR □□ type).

● : Stocked items
★ : Available in 2012

Internal toolholders

S-TLAN R/L Internal Turning & Facing T-type (Negative rake, Screw-on system)





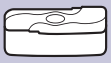
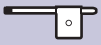
Right hand (R) shown.

Cat. No.	Stock		Min bore dia. øDm	Dimensions (mm)							α	θ	Inserts
	R	L		øDs	f	L1	L2	f2	h	h1			
New S25T-TLANR/L12-D530	★	★	53	25	17	300	40	22	23	11.5	-6°	-14°	LNMX1204□□L/R-□□R
New S32U-TLANR/L12-D530	★	★	53	32	22	350	45	22	29	14.5	-6°	-14°	
New S40V-TLANR/L12-D530	●	●	53	40	27	400	53	22	36	18	-6°	-14°	
S50U-TLANR/L16-D850	●	●	85	50	37	350	63	25	46	23	-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
★ : Available in 2012

Replacement parts

Cat. No.	Insert	Shim	Shim screw	Spring pin	Wrench for shim screw	Clamp screw	Wrench for clamp screw
				–			
TLANR/L1616H12	LNMX1204□□R/L	TSL12R/L	CSTF-2L055-S	–	T-6F-S	CSTB-3.5L115-S	KEYV-T10
TLANR/L1616M12S							
TLANR/L2020K12							
TLANR/L2525M12							
TLANR/L2020K16	LNMX1606□□R/L	TSL16R/L	–	PSP-16	–	CSTB-4L115-S	KEYV-T15
TLANR/L2525M16							
TLANR/L3232P16							
TLANR/L4040R16							
TLANR/L3232P24	LNMX2410□□R/L	TSL24R/L	–	SP 16-L14	–	CSTB-5L163-S	KEYV-T20
TLANR/L4040R24							
TLANR/L5050S24							
TLBNR/L4040R24	LNMX2410□□R/L	TSL24R/L	–	SP 16-L14	–	CSTB-5L163-S	KEYV-T20
TLFNR/L2525M16	LNMX1606□□L/R	TSL16L/R	–	PSP-16	–	CSTB-4L115-S	KEYV-T15
TLFNR/L3232P16							
S25T-TLANR/L12-D530	LNMX1204□□L/R	TSL12L/RI	CSTF-2L055-S	–	T-6F-S	CSTB-3.5L115-S	KEYV-T10
S32U-TLANR/L12-D530							
S40V-TLANR/L12-D530							
S50U-TLANR/L16-D850	LNMX1606□□L/R	TSL16L/RI	–	PSP-16	–	CSTB-4L115-S	KEYV-T15

Standard cutting conditions

*** Values in red shows the condition for facing**

LNMX1204□□□-□□□

Work materials	Chip-breakers	Grades	Cutting speed *Vc* (m/min)	Depth of cut: *ap* (mm)		Feed: *f* (mm/rev)	
				r_ε: 0.8	r_ε: 1.2	r_ε: 0.8	r_ε: 1.2
Steels S45C, SCM415 etc. (C45, 18CrMo4 etc.)	TDR	T9115	120 - 250	0.5 - 5 0.5 - 2.2	0.8 - 5 0.8 - 2.2	0.15 - 0.6	0.25 - 0.8
		T9125	80 - 180				
	TWR	T9115	120 - 250	0.5 - 5 0.5 - 2.2	0.8 - 5 0.8 - 2.2	0.15 - 0.6	0.25 - 0.8
		T9125	80 - 180				
Stainless steels SUS304, SUS316 etc. (X5CrNi18-9, X5CrNiMo17-12-2 etc.)	TDR	T9115	100 - 180	0.5 - 5 0.5 - 2.2	0.8 - 5 0.8 - 2.2	0.15 - 0.6	0.25 - 0.8
		T9125	80 - 180				
	TWR	T9115	100 - 180	0.5 - 5 0.5 - 2.2	0.8 - 5 0.8 - 2.2	0.15 - 0.6	0.25 - 0.8
		T9125	80 - 180				

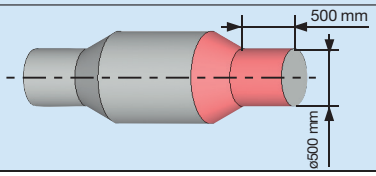
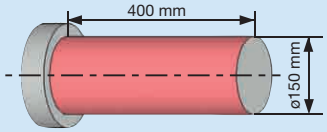
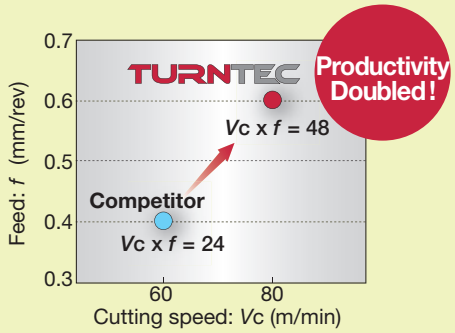
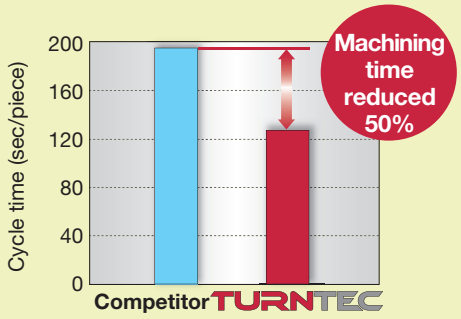
LNMX1606□□□-□□□

Work materials	Chip-breakers	Grades	Cutting speed *Vc* (m/min)	Depth of cut: *ap* (mm)			Feed: *f* (mm/rev)		
				r_ε: 0.8	r_ε: 1.2	r_ε: 1.6	r_ε: 0.8	r_ε: 1.2	r_ε: 1.6
Steels S45C, SCM415 etc. (C45, 18CrMo4 etc.)	TDR	T9115	120 - 250	0.5 - 5 0.5 - 3.2	0.8 - 6 0.8 - 3.2	1 - 8 1 - 3.2	0.15 - 0.6	0.25 - 0.8	0.3 - 1
		T9125	80 - 180						
	TWR	T9115	120 - 250	0.5 - 5 0.5 - 3.2	0.8 - 6 0.8 - 3.2	-	0.15 - 0.6	0.25 - 0.8	-
		T9125	80 - 180						
Stainless steels SUS304, SUS316 etc. (X5CrNi18-9, X5CrNiMo17-12-2 etc.)	TDR	T9115	100 - 180	0.5 - 5 0.5 - 3.2	0.8 - 6 0.8 - 3.2	1 - 8 1 - 3.2	0.15 - 0.6	0.25 - 0.8	0.3 - 1
		T9125	80 - 180						
	MDR	T9115	100 - 150	1.5 - 6 0.5 - 3.2	1.5 - 7 0.8 - 3.2	-	0.1 - 0.5	0.15 - 0.7	-
		AH725	50 - 150						
	TWR	T9115	100 - 180	0.5 - 5 0.5 - 3.2	0.8 - 6 0.8 - 3.2	-	0.15 - 0.6	0.25 - 0.8	-
		T9125	80 - 180						

LNMX2410□□□-□□□

Work materials	Chip-breakers	Grades	Cutting speed *Vc* (m/min)	Depth of cut: *ap* (mm)		Feed: *f* (mm/rev)	
				r_ε: 1.6	r_ε: 2.4	r_ε: 1.6	r_ε: 2.4
Steels S45C, SCM415 etc. (C45, 18CrMo4 etc.)	TDR	T9115	120 - 250	4 - 15 1 - 4.5	5 - 15 1 - 4.5	0.3 - 1.0	0.3 - 1.1
		T9125	80 - 150				
Stainless steels SUS304, SUS316 etc. (X5CrNi18-9, X5CrNiMo17-12-2 etc.)	TDR	T9115	100 - 180	4 - 15 1 - 4.5	5 - 15 1 - 4.5	0.3 - 1.0	0.3 - 1.1
		T9125	80 - 150				

Practical examples

Workpiece type		Shaft	Shaft
Toolholder		TLANR3232P16	TLANR3232P16
Insert		LNMX160612R-TDR	LNMX160616R-TDR
Grade		T9125	T9125
Work material		Alloy steel	S45C / C45 (200HB)
			
Cutting conditions	Cutting speed : *Vc* (m/min)	80	150
	Feed : *f* (mm/rev)	0.6	0.6
	Depth of cut : *ap* (mm)	5	8
	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 times.	 Even with a large DoC, the TDR insert enables higher feed machining compared to conventional ISO inserts with pressed chipbreakers.

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