Tungaloy

Keeping the Customer First

Tungaloy Report No.365-E

The Complete Solution
OSG TUNGALOY Global Alliance

TAC Toolholders for External and Internal Turning

TurningA

Turning Ace

Turning A

Excellent Cost Performance, Higher Indexing Accuracy and Clamping Rigidity

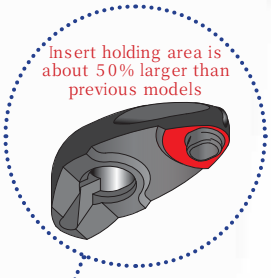
Turning A

Improved clamping rigidity provides more accurate cutting-edge positioning and longer tool life !

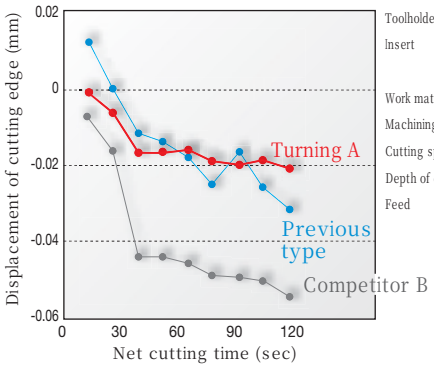
Allows stable machining

Larger insert holding area

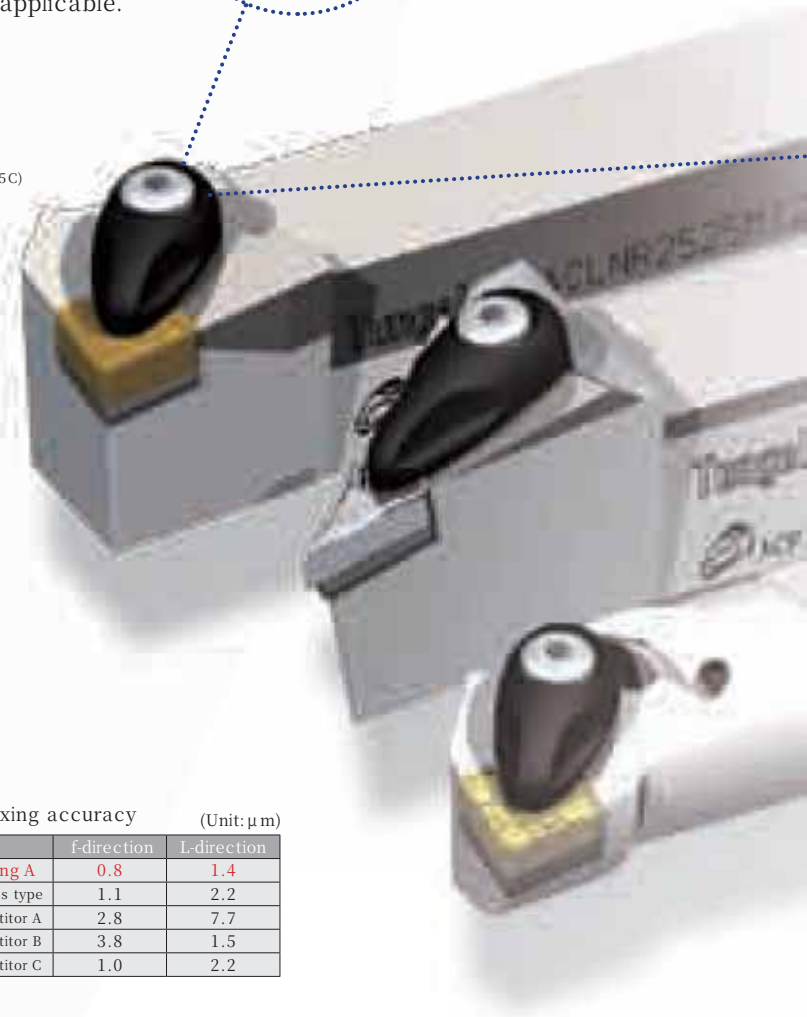
Enlarged insert holding area of the clamp allows more accurate cutting edge positioning. It delivers high performance even when using VNMG type (35 °corner angle)inserts, which tend to destabilize cutting- edge positioning.
Note: YNMG type inserts (25 °corner angle) are also applicable.



■Comparison of cutting-edge stability

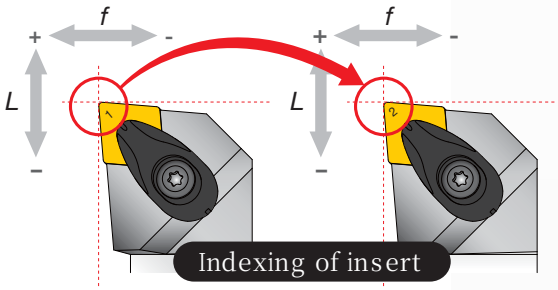


Toolholder : AVJNR2525M16-A
Insert : VNMG160408-ZM (Grade: T9025)
Work material : Carbon steel (JIS S45C)
Machining mode : Continuous
Cutting speed : v_c=150 m/min
Depth of cut : a_p=1.0～2.0 mm
Feed : f =0.3 mm/rev



Higher indexing accuracy

Reexamined and optimized clamping system provides higher cutting-edge positioning accuracy when replacing or indexing inserts.



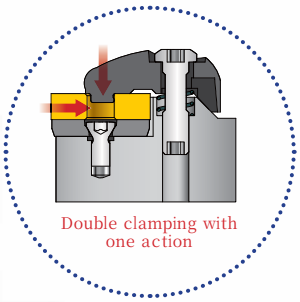
■Indexing accuracy (Unit: μm)

	f-direction	L-direction
Turning A	0.8	1.4
Previous type	1.1	2.2
Competitor A	2.8	7.7
Competitor B	3.8	1.5
Competitor C	1.0	2.2

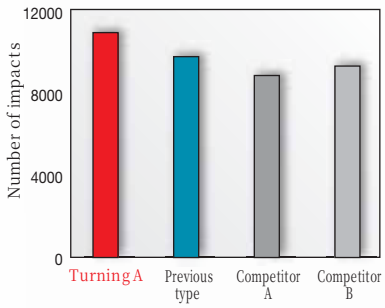
Improved tool life

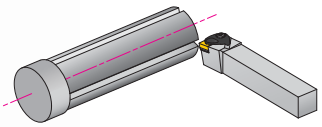
Higher clamping rigidity

Double clamping system allows secure clamping (pressing and pulling down the insert) with only one action and this contributes to extend the inserts 'tool life.
Especially when interrupted cutting, impact resistance of the insert has been dramatically improved.



■Comparison of impact resistance



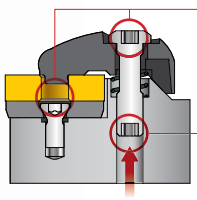


Toolholder : ACLNR2525M12-A
Insert : CNMG120408-TM (Grade: T9015)
Work material : Carbon steel (JIS S45C)
Machining mode : Interrupted
Cutting speed : v_c=200 m/min
Depth of cut : a_p=1.0～2.0 mm
Feed : f=0.3 mm/rev

Easy handling & low cost

Only one wrench is required for clamping insert

Its simple structure keeps cost low. Easy assembling with only one wrench.



Needs only one wrench for both clamping insert and changing shim.

Easy clamping even when holder is in upside-down position.

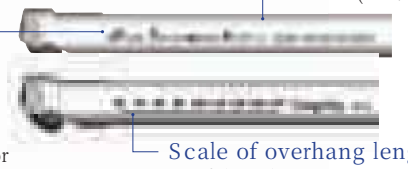
Marking specifications

External-use toolholder

Toolholder Cat. No.

Spare parts Cat. No.
All fuss-free for repeat order or even when missing parts

Internal-use toolholders

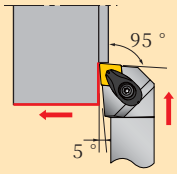


Toolholder Cat. No.
(Min. bore diameter is given in Cat. Nos.)

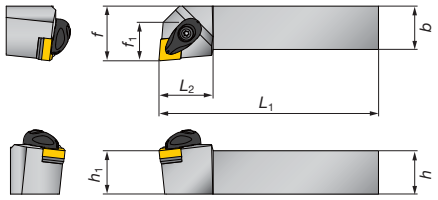
The last three digits indicate min. bore diameter.
(Example: -320 indicates 32.0 mm)

Scale of overhang length
Useful guide in setting toolholder

ACLN R/L External turning and facing — A-type (Negative rake, clamp-on type)



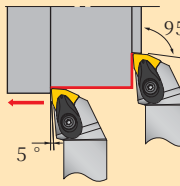
Cutting edge style: L



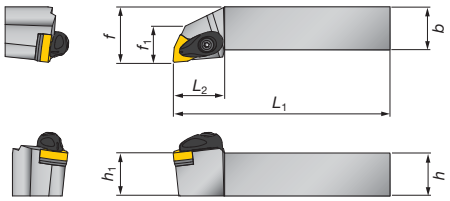
Right hand (R) shown

Toolholder Cat. No.	Stock		Dimensions (mm)							Std. corner radius r_ε	Applicable inserts	Insert page
	R	L	h	b	L_1	L_2	h_1	f	f_1			
ACLNR/L2020K12-A	●	●	20	20	125	26	20	25	19	0.8	CN□□1204□□	P.11
ACLNR/L2525M12-A	●	●	25	25	150	30	25	32	21			
ACLNR/L3225P12-A	●	●	32	25	170	30	32	32	21			

AWLN R/L External turning and facing — A-type (Negative rake, clamp-on type)



Cutting edge style: L

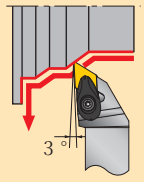


Right hand (R) shown

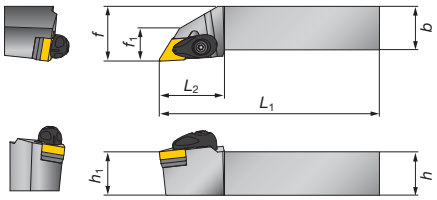
Toolholder Cat. No.	Stock		Dimensions (mm)							Std. corner radius r_ε	Applicable inserts	Insert page
	R	L	h	b	L_1	L_2	h_1	f	f_1			
AWLNR/L2020K06-A	●	●	20	20	125	27	20	25	16	0.8	WN□□0604□□	P.16
AWLNR/L2525M06-A	●	●	25	25	150	27	25	32	23			
AWLNR/L2020K08-A	●	●	20	20	125	30	20	25	19	0.8	WN□□0804□□	P.17
AWLNR/L2525M08-A	●	●	25	25	150	30	25	32	21			
AWLNR/L3225P08-A	●	●	32	25	170	30	32	32	21			

●: Stocked in Japan

ADJN R/L External turning and profiling — A-type (Negative rake, clamp-on type)



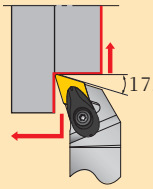
Cutting edge style: J



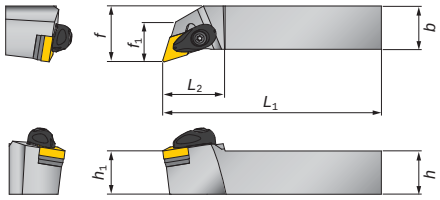
Right hand (R) shown

Toolholder Cat. No.	Stock		Dimensions (mm)							Std. corner radius r_ε	Applicable inserts	Insert page
	R	L	h	b	L_1	L_2	h_1	f	f_1			
ADJNR/L2020K15-A	●	●	20	20	125	36	20	25	17	0.8	DN□□1504□□	P.12
ADJNR/L2525M15-A	●	●	25	25	150	36	25	32	18			
ADJNR/L3225P15-A	●	●	32	25	170	36	32	32	18			
ADJNR/L2020K1506-A	●	●	20	20	125	36	20	25	17	0.8	DN□□1506□□	P.13
ADJNR/L2525M1506-A	●	●	25	25	150	36	25	32	18			

ADQN R/L Profiling — A-type (Negative rake, clamp-on type)



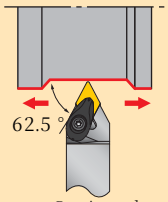
Cutting edge style: Q



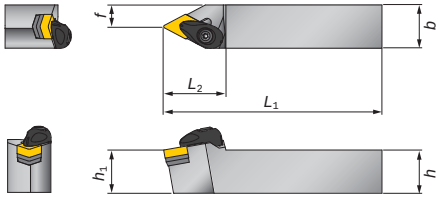
Right hand (R) shown

Toolholder Cat. No.	Stock		Dimensions (mm)							Std. corner radius r_ε	Applicable inserts	Insert page
	R	L	h	b	L_1	L_2	h_1	f	f_1			
ADQNR/L2020K15-A	●	●	20	20	125	32	20	25	21	0.8	DN□□1504□□	P.12
ADQNR/L2525M15-A	●	●	25	25	150	36	25	32	23			
ADQNR/L2020K1506-A	●	●	20	20	125	32	20	25	21	0.8	DN□□1506□□	P.13
ADQNR/L2525M1506-A	●	●	25	25	150	36	25	32	23			

ADPN N External turning and profiling — A-type (Negative rake, clamp-on type)



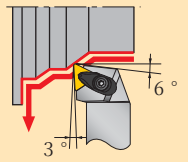
Cutting edge style: P



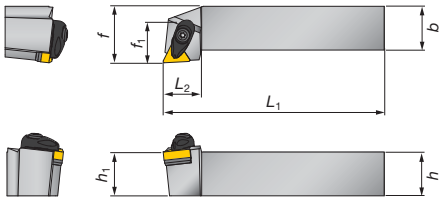
Toolholder Cat. No.	Stock	Dimensions (mm)							Std. corner radius r_ε	Applicable inserts	Insert page
		h	b	L_1	L_2	h_1	f	f_1			
ADPNN2020K15-A	●	20	20	125	36	20	7.5	–	0.8	DN□□1504□□	P.12
ADPNN2525M15-A	●	25	25	150	36	25	12.5	–			

● : Stocked in Japan

ATJN R/L External turning and profiling — A-type (Negative rake, clamp-on type)



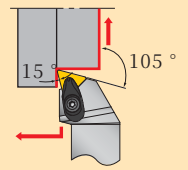
Cutting edge style: J



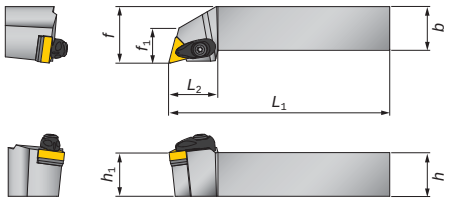
Right hand (R) shown

Toolholder Cat. No.	Stock		Dimensions (mm)							Std. corner radius r_ε	Applicable inserts	Insert page
	R	L	h	b	L_1	L_2	h_1	f	f_1			
ATJNR/L2020K16-A	●	●	20	20	125	22	20	25	23	0.8	TN□□1604□□	P.15
ATJNR/L2525M16-A	●	●	25	25	150	22	25	32	25			

ATQN R/L Profiling — A-type (Negative rake, clamp-on type)



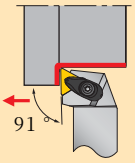
Cutting edge style: Q



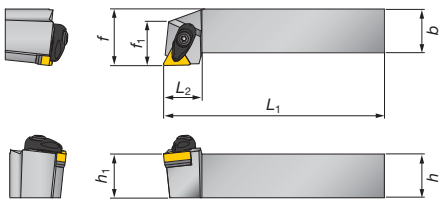
Right hand (R) shown

Toolholder Cat. No.	Stock		Dimensions (mm)							Std. corner radius r_ε	Applicable inserts	Insert page
	R	L	h	b	L_1	L_2	h_1	f	f_1			
ATQNR/L2020K16-A	●	●	20	20	125	28	20	25	18	0.8	TN□□1604□□	P.15
ATQNR/L2525M16-A	●	●	25	25	150	28	25	32	20			

ATGN R/L External turning — A-type (Negative rake, clamp-on type)



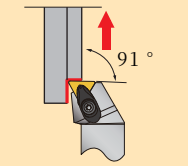
Cutting edge style: G



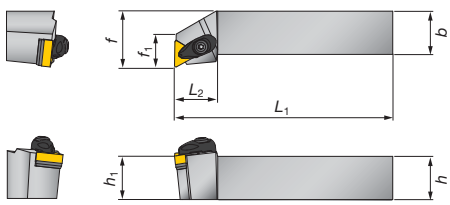
Right hand (R) shown

Toolholder Cat. No.	Stock		Dimensions (mm)							Std. corner radius r_ε	Applicable inserts	Insert page
	R	L	h	b	L_1	L_2	h_1	f	f_1			
ATGNR/L2020K16-A	●	●	20	20	125	22	20	25	22	0.8	TN□□1604□□	P.15
ATGNR/L2525M16-A	●	●	25	25	150	22	25	32	25			
ATGNR/L2525M22-A	●	●	25	25	150	26	25	32	26	0.8	TN□□2204□□	P.16

ATFN R/L Facing — A-type (Negative rake, clamp-on type)



Cutting edge style: F

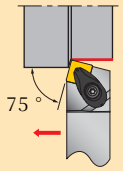


Right hand (R) shown

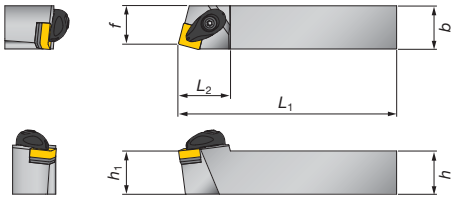
Toolholder Cat. No.	Stock		Dimensions (mm)							Std. corner radius r_ε	Applicable inserts	Insert page
	R	L	h	b	L_1	L_2	h_1	f	f_1			
ATFNR/L2020K16-A	●	●	20	20	125	25	20	25	18	0.8	TN□□1604□□	P.15
ATFNR/L2525M16-A	●	●	25	25	150	25	25	32	19			
ATFNR/L2525M22-A	●	●	25	25	150	29	25	32	23	0.8	TN□□2204□□	P.16

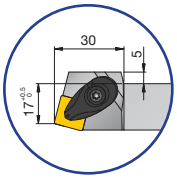
● : Stocked in Japan

ASBN R/L External turning — A-type (Negative rake, clamp-on type)



Cutting edge style: B

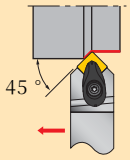




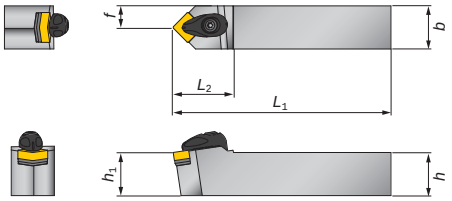
□Enlarged view of 2020 type
Right hand (R) shown

Toolholder Cat. No.	Stock		Dimensions (mm)							Std. corner radius r_ε	Applicable inserts	Insert page
	R	L	h	b	L_1	L_2	h_1	f	f_1			
ASBNR/L2020K12-A	●	●	20	20	125	30	20	17	–	0.8	SN□□1204□□	P.14
ASBNR/L2525M12-A	●	●	25	25	150	30	25	22	–			

ASDN N External chamfering — A-type (Negative rake, clamp-on type)

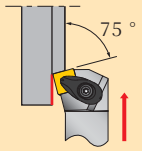


Cutting edge style: D

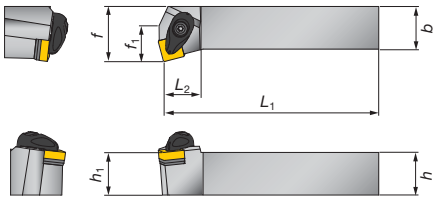


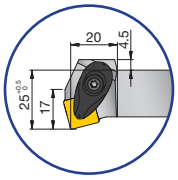
Toolholder Cat. No.	Stock	Dimensions (mm)							Std. corner radius r_ε	Applicable inserts	Insert page
		h	b	L_1	L_2	h_1	f	f_1			
ASDNN2020K12-A	●	20	20	125	35	20	10	–	0.8	SN□□1204□□	P.14
ASDNN2525M12-A	●	25	25	150	35	25	12.5	–			

ASKN R/L Facing — A-type (Negative rake, clamp-on type)



Cutting edge style: K

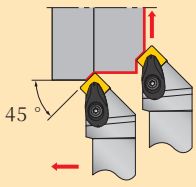




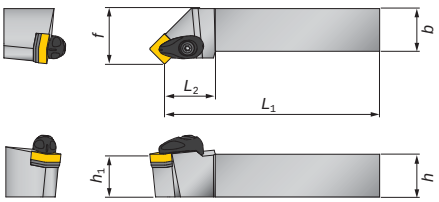
□Enlarged view of 2020 type
Right hand (R) shown

Toolholder Cat. No.	Stock		Dimensions (mm)							Std. corner radius r_ε	Applicable inserts	Insert page
	R	L	h	b	L_1	L_2	h_1	f	f_1			
ASKNR/L2020K12-A	●	●	20	20	125	20	20	25	17	0.8	SN□□1204□□	P.14
ASKNR/L2525M12-A	●	●	25	25	150	22	25	32	21			

ASSN R/L External chamfering — A-type (Negative rake, clamp-on type)



Cutting edge style: S

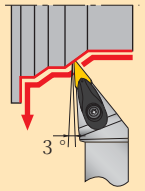


Right hand (R) shown

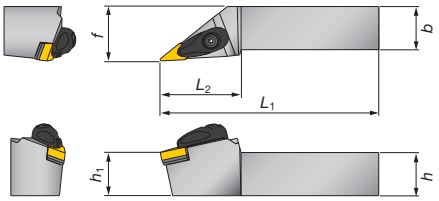
Toolholder Cat. No.	Stock		Dimensions (mm)							Std. corner radius r_ε	Applicable inserts	Insert page
	R	L	h	b	L_1	L_2	h_1	f	f_1			
ASSNR/L2020K12-A	●	●	20	20	125	30	20	25	–	0.8	SN□□1204□□	P.14
ASSNR/L2525M12-A	●	●	25	25	150	30	25	32	–			

● : Stocked in Japan

AVJN R/L External turning and profiling — A-type (Negative rake, clamp-on type)



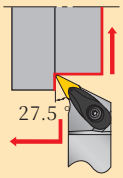
Cutting edge style: J



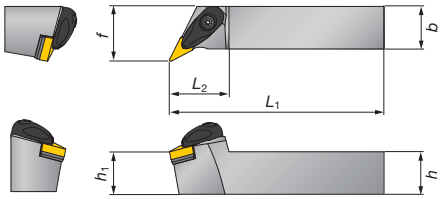
Right hand (R) shown

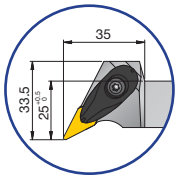
Toolholder Cat. No.	Stock R	Stock L	Dimensions (mm) h	b	L_1	L_2	h_1	f	f_1	Std. corner radius r_ε	Applicable inserts	Insert page
AVJNR/L2020K16-A	●	●	20	20	125	43	20	25	–	0.8	VN□□1604□□	P.18
AVJNR/L2525M16-A	●	●	25	25	150	46	25	32	–		YN□□1604□□	P.17

AVQN R/L Profiling — A-type (Negative rake, clamp-on type)



Cutting edge style: Q



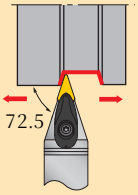


□Enlarged view of 2020 type

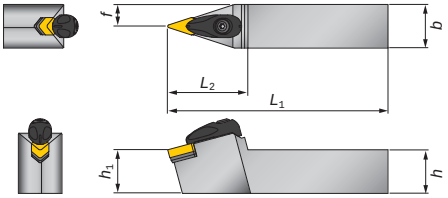
Right hand (R) shown

Toolholder Cat. No.	Stock R	Stock L	Dimensions (mm) h	b	L_1	L_2	h_1	f	f_1	Std. corner radius r_ε	Applicable inserts	Insert page
AVQNR/L2020K16-A	●	●	20	20	125	35	20	25	–	0.8	VN□□1604□□	P.18
AVQNR/L2525M16-A	●	●	25	25	150	35	25	32	–		YN□□1604□□	P.17

AVVN N External turning and profiling — A-type (Negative rake, clamp-on type)

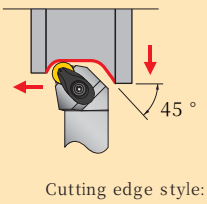


Cutting edge style: V

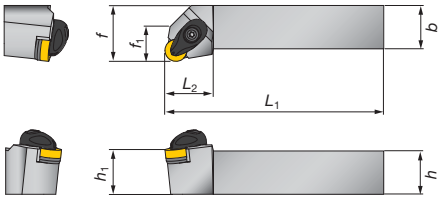


Toolholder Cat. No.	Stock	Dimensions (mm) h	b	L_1	L_2	h_1	f	f_1	Std. corner radius r_ε	Applicable inserts	Insert page
AVVNN2020K16-A	●	20	20	125	46	20	10	–	0.8	VN□□1604□□	P.18
AVVNN2525M16-A	●	25	25	150	46	25	12.5	–		YN□□1604□□	P.17

ARGN R/L External profiling — A-type (Negative rake, clamp-on type)



Cutting edge style: G

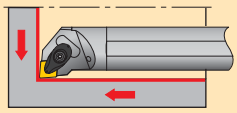


Right hand (R) shown

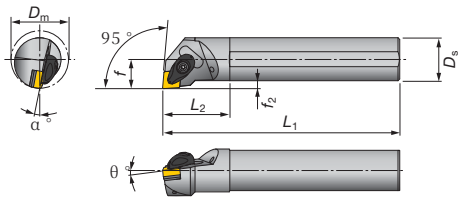
Toolholder Cat. No.	Stock R	Stock L	Dimensions (mm) h	b	L_1	L_2	h_1	f	f_1	Std. corner radius r_ε	Applicable inserts	Insert page
ARGNR/L2525M12-A	●	●	25	25	150	28	25	32	20	6.35	RN□□120400	P.13

● : Stocked in Japan

A□□□-ACLN R/L Boring and internal facing — A-type (Negative rake, clamp-on type)



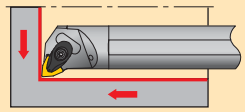
Cutting edge style: L



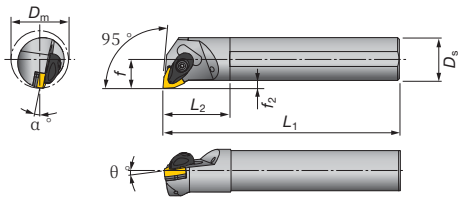
Right hand (R) shown

Toolholder Cat. No.	Stock R	Stock L	Min. bore dia. D_m	Dimensions (mm) D_s	f	L_1	L_2	h	f_2	α°	θ°	Std. corner radius r_ε	Applicable inserts	Insert page
A25R-ACLNR/L12-D320	●	●	32	25	17	200	45	23	4.5	-13	-6	0.8	CN□□1204□□	P.11
A32S-ACLNR/L12-D400	●	●	40	32	22	250	50	30	6	-10				
A40T-ACLNR/L12-D500	●	●	50	40	27	300	55	37	7	-8				

A□□□-AWLN R/L Boring and internal facing — A-type (Negative rake, clamp-on type)



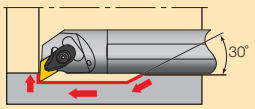
Cutting edge style: L



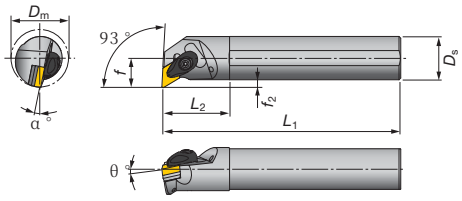
Right hand (R) shown

Toolholder Cat. No.	Stock R	Stock L	Min. bore dia. D_m	Dimensions (mm) D_s	f	L_1	L_2	h	f_2	α°	θ°	Std. corner radius r_ε	Applicable inserts	Insert page
A25R-AWLNR/L06-D320	●	●	32	25	17	200	45	23	4.5	-13	-6	0.8	WN□□0604□□	P.16
A32S-AWLNR/L06-D400	●	●	40	32	22	250	50	30	6	-10				
A25R-AWLNR/L08-D320	●	●	32	25	17	200	45	23	4.5	-13	-6	0.8	WN□□0804□□	P.17
A32S-AWLNR/L08-D400	●	●	40	32	22	250	50	30	6	-10				
A40T-AWLNR/L08-D500	●	●	50	40	27	300	55	37	7	-8				
A50U-AWLNR/L08-D630	●	●	63	50	35	350	65	47	10	-7				

A□□□-ADUN R/L Boring and internal profiling — A-type (Negative rake, clamp-on type)



Cutting edge style: U

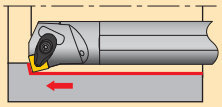


Right hand (R) shown

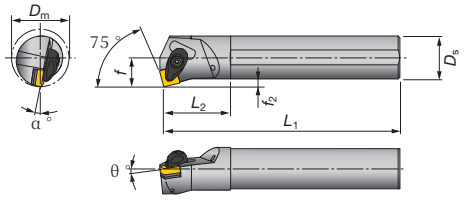
Toolholder Cat. No.	Stock R	Stock L	Min. bore dia. D_m	Dimensions (mm) D_s	f	L_1	L_2	h	f_2	α°	θ°	Std. corner radius r_ε	Applicable inserts	Insert page
A25R-ADUNR/L15-D320	●	●	32	25	17	200	45	23	4.5	-13	-6	0.8	DN□□1504□□	P.12
A32S-ADUNR/L15-D400	●	●	40	32	22	250	50	30	6	-11				
A25R-ADUNR/L1506-D320	●	●	32	25	17	200	45	23	4.5	-13	-6	0.8	DN□□1506□□	P.13
A32S-ADUNR/L1506-D400	●	●	40	32	22	250	50	30	6	-11				

● : Stocked in Japan

A□□□-ASKN R/L Through boring — A-type (Negative rake, clamp-on type)



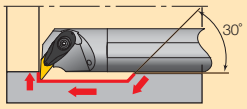
Cutting edge style: K



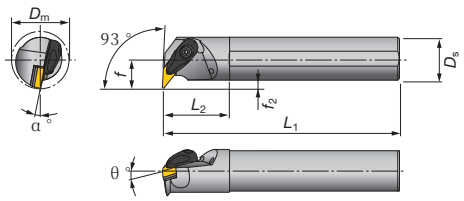
Right hand (R) shown

Toolholder Cat. No.	Stock R	Stock L	Min. bore dia. D_m	Dimensions (mm) D_s	f	L_1	L_2	h	f_2	α °	θ °	Std. corner radius r_ε	Applicable inserts	Insert page
A25R-ASKNR/L12-D320	●	●	32	25	17	200	45	23	4.5	-13	-6	0.8	SN□□1204□□	P.14
A32S-ASKNR/L12-D400	●	●	40	32	22	250	50	30	6	-10				

A□□□-AVUN R/L Internal profiling — A-type (Negative rake, clamp-on type)



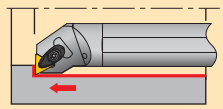
Cutting edge style: U



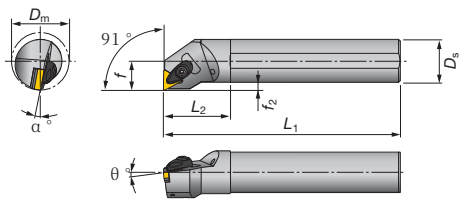
Right hand (R) shown

Toolholder Cat. No.	Stock R	Stock L	Min. bore dia. D_m	Dimensions (mm) D_s	f	L_1	L_2	h	f_2	α °	θ °	Std. corner radius r_ε	Applicable inserts	Insert page
A32S-AVUNR/L16-D400	●	●	40	32	22	250	50	30	6	-10	-6	0.8	VN□□1604□□ YN□□1604□□	P.18 P.17
A40T-AVUNR/L16-D500	●	●	50	40	27	300	55	37	7	-8				

A□□□-ATFN R/L Stop boring — A-type (Negative rake, clamp-on type)



Cutting edge style: F



Right hand (R) shown

Toolholder Cat. No.	Stock R	Stock L	Min. bore dia. D_m	Dimensions (mm) D_s	f	L_1	L_2	h	f_2	α °	θ °	Std. corner radius r_ε	Applicable inserts	Insert page
A25R-ATFNR/L16-D320	●	●	32	25	17	200	45	23	4.5	-13	-6	0.8	TN□□1604□□	P.15
A32S-ATFNR/L16-D400	●	●	40	32	22	250	50	30	6	-10				

● : Stocked in Japan

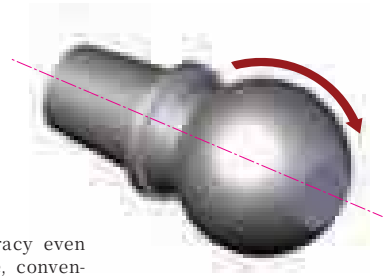
●Replacement parts

Toolholder Cat. No.	Applicable inserts	Clamp	Clamp screw	Shim	Shim screw	Spring	Spring pin	Wrench	Recommended clamping torque (N·m)
ACLNR/L (External· Internal)	**CN□□1204** □□	ACP4S	ACS-5W	ASC422	CSTB-3.5	BP-7	SP-2.5	T-15F	4.0
ADJNR/L **ADPNN** **ADQNR/L** **ADUNR/L** (Internal)	**DN□□1504□□**	ACP4S	ACS-5W	ASD432	CSTB-3.5	BP-7	SP-2.5	T-15F	4.0
ADJNR/L **ADQNR/L** **ADUNR/L** (Internal)	**DN□□1506□□**	ACP4S	ACS-5W	ASD423	CSTB-3.5	BP-7	SP-2.5	T-15F	4.0
ATGNR/L **ATFNR/L**	**TN□□2204□□**	ACP4S	ACS-5W	AST422	CSTB-3.5	BP-7	SP-2.5	T-15F	4.0
ATJNR/L **ATGNR/L** **ATFNR/L** (External· Internal) **ATQNR/L**	**TN□□1604□□**	ACP3S	ACS-5W	AST322	CSTB-3.5	BP-7	SP-2.5	T-15F	3.0
ASBNR/L **ASDNN** **ASSNR/L** **ASKNR/L** (External· Internal)	**SN□□1204□□**	ACP4S	ACS-5W	ASS422	CSTB-3.5	BP-7	SP-2.5	T-15F	4.0
AVJNR/L **AVVNN** **AVQNR/L** **AVUNR/L** (Internal)	**VN□□1604□□** **YN□□1604□□**	ACP3L	ACS-5W	ASV322	CSTB-3.5	BP-7	SP-2.5	T-15F	3.0
AWLNR/L (External· Internal)	**WN□□0604□□**	ACP3S	ACS-5W	ASW322	CSTB-3.5	BP-7	SP-2.5	T-15F	3.0
AWLNR/L (External· Internal)	**WN□□0804□□**	ACP4S	ACS-5W	ASW422	CSTB-3.5	BP-7	SP-2.5	T-15F	4.0
ARGNR/L	**RN□□1204□□**	ACP4S	ACS-5W	ASR420	CSTB-3.5	BP-7	SP-2.5	T-15F	4.0

Note: Replacement parts of former A-type toolholders are not applicable to“ Turning A ”toolholders.

Practical examples

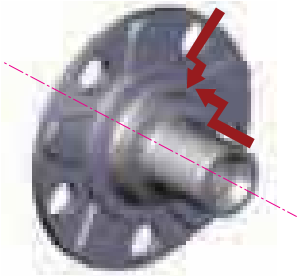
Toolholder: AVVNN2525M16-A
Insert: VNMG160404-ZF(GT730)



Work material: Chromium steel (JIS SCr420)
Cutting speed: v_c=100～250 m/min
Depth of cut: a_p=0.5 mm
Feed: f =0.12 mm/rev
Coolant: Emulsion type (External supply)

●Results: Improved indexing accuracy of Turning A proved consistent dimensional accuracy even after replacing inserts, and it contributed to increase productivity. Furthermore, conventional tools often reached to the end of its life due to the deterioration of machining accuracy caused from unstable cutting edge positioning and wear developing. However, Turning A's improved insert holding method could minimize the cutting edge displacement and realized consistent machining accuracy. Combined with highly wear resistant GT730 grade, Turning A could double the tool life.

Toolholder: ACLNR2525M12-A
Insert: CNMG120412-TM(T9025)



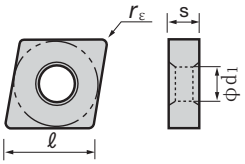
Work material: Carbon steel (JIS S53C)
Cutting speed: v_c=150～200 m/min
Depth of cut: a_p=2.0 mm
Feed: f =0.25～0.30 mm/rev
Coolant: Emulsion type (External supply)

●Results: Because of heavy impacts in interrupted facing, tool life of the conventional tool was not consistent. On the other hand, Turning A, provided with highly rigid clamping mechanism, suppressed unexpected insert breakage and lengthened the average tool life to 1.5 times that of the conventional tool.

Typical insert types used for“ Turning A ”toolholders are listed in the following tables.

80 °Rhombic with hole Negative

CN□□1204



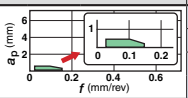
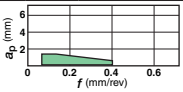
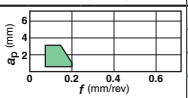
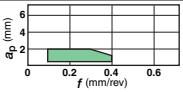
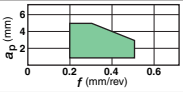
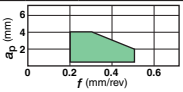
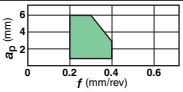
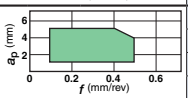
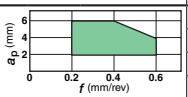
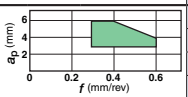
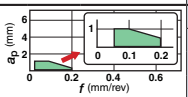
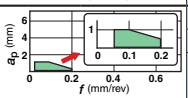
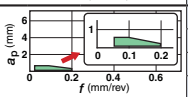
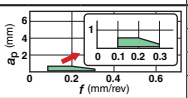
CN□□ 12 04 □□ - □□

- 12: Cutting edge length (ℓ)=12.9mm
- 04: Thickness(s)=4.76mm
- □□: Chipbreaker symbol
- Hole dia.(ϕd_1) : ϕ 5.16mm
- Corner radius(r_ε)

Note: Cutting edge length (ℓ) is theoretical value for when corner radius is zero.

Applicable toolholder

ACLN R/L(P.3)
A□□□-ACLN R/L(P.8)

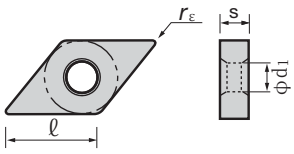
Application	Chipbreaker symbol	Appearance	f - a_p diagram	Insert Cat. No. (Metric)	Corner radius r_ε	Stocked grades: Coated T9005	T9015	T9025	T9035	T6020	T6030	T5105	T5115	T5125	Coated cermet GT720	GT730	Cer-met NS730	T-CBN BXC30	BXC50			T-DIA DX120	DX140	DX160
Precision finishing	TF (M-class)			CNMG120404-TF	0.4										●	●	●							
				CNMG120408-TF	0.8										●	●	●							
Finishing	TSF (M-class)			CNMG120404-TSF	0.4	●	●	●	●		●				●	●	●							
				CNMG120408-TSF	0.8	●	●	●	●		●				●	●	●							
				CNMG120412-TSF	1.2	●	●	●	●															
	SS (M-class)			CNMG120404-SS	0.4					●	●													
				CNMG120408-SS	0.8					●	●													
				CNMG120412-SS	1.2					●	●													
	CF (M-class)			CNMG120404-CF	0.4							●	●											
				CNMG120408-CF	0.8							●	●											
				CNMG120412-CF	1.2							●	●											
Medium cutting	TM (M-class)			CNMG120404-TM	0.4	●	●	●	●		●					●	●							
				CNMG120408-TM	0.8	●	●	●	●		●					●	●							
				CNMG120412-TM	1.2	●	●	●	●		●					●	●							
				CNMG120416-TM	1.6		●	●	●		●													
	SM (M-class)			CNMG120404-SM	0.4					●	●													
				CNMG120408-SM	0.8					●	●													
				CNMG120412-SM	1.2					●	●													
	All-round groove (M-class)			CNMG120404	0.4	●	●	●	●			●	●	●	●	●	●							
				CNMG120408	0.8	●	●	●	●			●	●	●	●	●	●							
				CNMG120412	1.2	●	●	●	●			●	●	●										
				CNMG120416	1.6	●	●	●	●			●	●	●										
	CM (M-class)			CNMG120404-CM	0.4							●	●	●										
				CNMG120408-CM	0.8							●	●	●										
				CNMG120412-CM	1.2							●	●	●										
Medium to heavy cutting	CH (M-class)			CNMG120404-CH	0.4							●	●	●										
				CNMG120408-CH	0.8							●	●	●										
				CNMG120412-CH	1.2							●	●	●										
	TH (M-class)			CNMG120408-TH	0.8	●	●	●	●		●													
				CNMG120412-TH	1.2	●	●	●	●		●													
				CNMG120416-TH	1.6	●	●	●	●		●													
Precision finishing	T-DIA (G-class)			CNGA120404-DIA	0.4																		●	
	T-DIA (M-class) With rake angle			CNMM120402-DIA	0.2																	●		
				CNMM120404-DIA	0.4																	●		
	T-CBN (G-class)			4QP-CNGA120404	0.4													●	●					
				4QP-CNGA120408	0.8													●	●					
				4QP-CNGA120412	1.2													●	●					
	T-CBN (M-class) With wiper edge			4QP-CNMA120404W	0.4														●					
				4QP-CNMA120408W	0.8														●					
				4QP-CNMA120412W	1.2														●					

P Steels M Stainless steels K Cast irons N Nonferrous metals H Hard materials

●: Stocked in Japan

55 °Rhombic with hole Negative

DN□□1504



DN□□ 15 04 □□ - □□

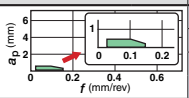
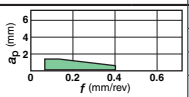
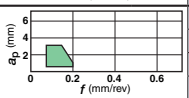
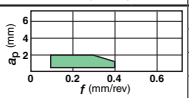
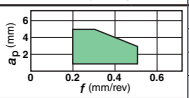
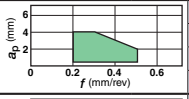
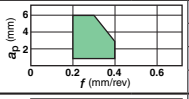
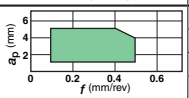
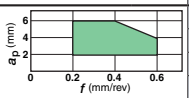
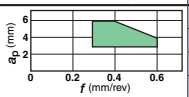
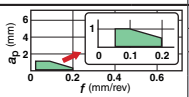
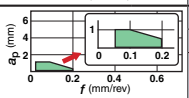
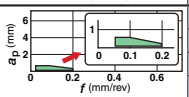
Cutting edge length(ℓ)=15.5mm | Thickness(s)=4.76mm | Chipbreaker symbol

Hole dia.(ϕd_1) : ϕ 5.16mm | Corner radius(r_ε)

Note: Cutting edge length (ℓ) is theoretical value for when corner radius is zero.

Applicable toolholder

ADJN R/L(P.4)
ADPN N(P.4)
ADQN R/L(P.4)
A□□□-ADUN R/L(P.8)

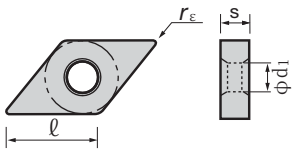
Application	Chipbreaker symbol	Appearance	f - a_p diagram	Insert Cat. No. (Metric)	Corner radius r_ε	Stocked grades: Coated T9005	T9015	T9025	T9035	T6020	T6030	T5105	T5115	T5125	Coated cermet GT720	GT730	Cermet NS730	T-CBN BXC30	BXC50	T-DIA DX120	DX140	DX160
Precision finishing	TF (M-class)			DNMG150404-TF	0.4										●	●	●					
				DNMG150408-TF	0.8										●	●	●					
Finishing	TSF (M-class)			DNMG150404-TSF	0.4	●	●	●	●		●				●	●	●					
				DNMG150408-TSF	0.8	●	●	●	●		●				●	●	●					
				DNMG150412-TSF	1.2	●	●	●	●													
	SS (M-class)			DNMG150404-SS	0.4					●	●											
				DNMG150408-SS	0.8					●	●											
				DNMG150412-SS	1.2					●	●											
	CF (M-class)			DNMG150404-CF	0.4							●	●									
				DNMG150408-CF	0.8							●	●									
				DNMG150412-CF	1.2							●	●									
Medium cutting	TM (M-class)			DNMG150404-TM	0.4	●	●	●	●		●					●	●					
				DNMG150408-TM	0.8	●	●	●	●		●					●	●					
				DNMG150412-TM	1.2	●	●	●	●		●					●	●					
				DNMG150416-TM	1.6		●	●	●													
	SM (M-class)			DNMG150404-SM	0.4					●	●											
				DNMG150408-SM	0.8					●	●											
				DNMG150412-SM	1.2					●	●											
	All-round groove (M-class)			DNMG150404	0.4	●	●	●	●			●	●	●	●	●	●					
				DNMG150408	0.8	●	●	●	●			●	●	●	●	●	●					
				DNMG150412	1.2	●	●	●	●			●	●	●		●	●					
				DNMG150416	1.6	●	●	●	●			●	●	●								
	CM (M-class)			DNMG150404-CM	0.4							●	●	●								
				DNMG150408-CM	0.8							●	●	●								
				DNMG150412-CM	1.2							●	●	●								
Medium to heavy cutting	CH (M-class)			DNMG150404-CH	0.4							●	●	●								
				DNMG150408-CH	0.8							●	●	●								
				DNMG150412-CH	1.2							●	●	●								
	TH (M-class)			DNMG150408-TH	0.8	●	●	●	●		●											
				DNMG150412-TH	1.2	●	●	●	●		●											
				DNMG150416-TH	1.6	●	●	●	●													
Precision finishing	T-DIA (G-class)			DNGA150404-DIA	0.4															●	●	●
				DNGA150408-DIA	0.8																●	
	T-DIA (M-class) With rake angle			DNMM150402-DIA	0.2															●		
				DNMM150404-DIA	0.4															●		
	T-CBN (G-class)			4QP-DNGA150404	0.4													●	●			
				4QP-DNGA150408	0.8													●	●			
				4QP-DNGA150412	1.2													●	●			

P Steels M Stainless steels K Cast irons N Nonferrous metals H Hard materials

● : Stocked in Japan

55 °Rhombic with hole Negative

DN□□1506



DN□□ 15 06 □□ - □□

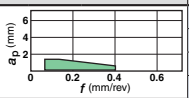
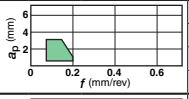
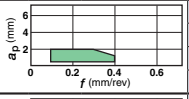
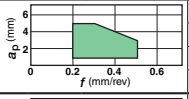
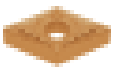
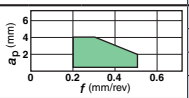
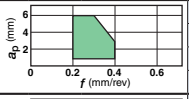
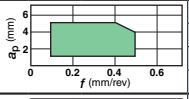
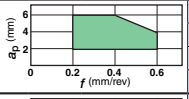
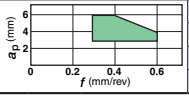
Cutting edge length(ℓ)=15.5mm | Thickness(s)=6.35mm | Chipbreaker symbol

Hole dia.(φd1) : φ 5.16mm | Corner radius(r_ε)

Note: Cutting edge length (ℓ) is theoretical value for when corner radius is zero.

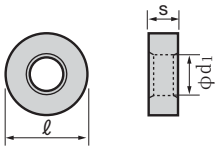
Applicable toolholder

ADJN R/L(P.4)
ADQN R/L(P.4)
A□□□-ADUN R/L(P.8)

Application	Chipbreaker symbol	Appearance	f - a_p diagram	Insert Cat. No. (Metric)	Corner radius r_ε	Stocked grades: Coated T9005	T9015	T9025	T9035	T6020	T6030	T5105	T5115	T5125	Coated cermet GT720	GT730	Cermet NS730	T-CBN BXC30	BXC50	T-DIA DX120	DX140	DX160
Finishing	TSF (M-class)			DNMG150604-TSF	0.4	●	●	●	●						●	●						
				DNMG150608-TSF	0.8	●	●	●	●							●						
				DNMG150612-TSF	1.2	●	●	●	●													
	SS (M-class)			DNMG150604-SS	0.4					●	●											
				DNMG150608-SS	0.8					●	●											
				DNMG150612-SS	1.2					●	●											
	CF (M-class)			DNMG150604-CF	0.4							●	●									
				DNMG150608-CF	0.8							●	●									
				DNMG150612-CF	1.2							●	●									
Medium cutting	TM (M-class)			DNMG150604-TM	0.4	●	●	●	●		●											
				DNMG150608-TM	0.8	●	●	●	●		●											
				DNMG150612-TM	1.2	●	●	●	●		●											
				DNMG150616-TM	1.6		●	●														
	SM (M-class)			DNMG150604-SM	0.4					●	●											
				DNMG150608-SM	0.8					●	●											
				DNMG150612-SM	1.2					●	●											
	All-round groove (M-class)			DNMG150604	0.4	●	●	●	●			●	●	●								
				DNMG150608	0.8	●	●	●	●			●	●	●								
				DNMG150612	1.2	●	●	●	●			●	●	●								
				DNMG150616	1.6	●	●	●	●													
	CM (M-class)			DNMG150604-CM	0.4							●	●	●								
				DNMG150608-CM	0.8							●	●	●								
				DNMG150612-CM	1.2							●	●	●								
Medium to heavy cutting	CH (M-class)			DNMG150604-CH	0.4							●	●	●								
				DNMG150608-CH	0.8							●	●	●								
				DNMG150612-CH	1.2							●	●	●								
	TH (M-class)			DNMG150608-TH	0.8	●	●	●	●		●											
				DNMG150612-TH	1.2	●	●	●	●		●											
				DNMG150616-TH	1.6	●	●	●	●													

Round, with hole Negative

RN□□1204



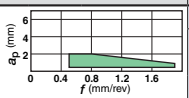
RN□□ 12 04 □□ - □□

Cutting edge length(ℓ)=12.0mm | Thickness(s)=4.76mm | Chipbreaker symbol

Hole dia.(φd1) : φ 5.16mm | Corner radius(r_ε)

Applicable toolholder

ARGN R/L(P.7)

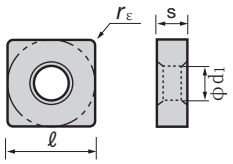
Application	Chipbreaker symbol	Appearance	f - a_p diagram	Insert Cat. No. (Metric)	Corner radius r_ε	Stocked grades: Coated T9005	T9015	T9025	T9035	T6020	T6030	T5105	T5115	T5125	Coated cermet GT720	GT730	Cermet NS730	T-CBN BXC30	BXC50	T-DIA DX120	DX140	DX160
Heavy cutting	61 (M-class)			RNMG120400-61	–	●	●	●	●													

P Steels | M Stainless steels | K Cast irons | N Nonferrous metals | H Hard materials

● : Stocked in Japan

90 °Square, with hole Negative

SN□□1204



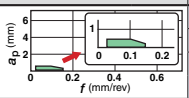
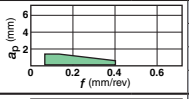
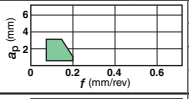
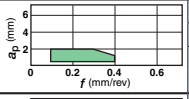
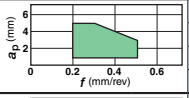
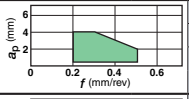
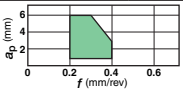
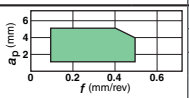
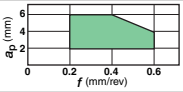
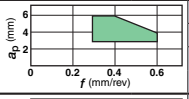
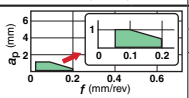
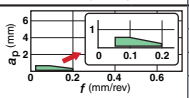
SN□□ 12 04 □□-□□

- 12: Cutting edge length (ℓ)=12.7mm
- 04: Thickness(s)=4.76mm
- □□-□□: Chipbreaker symbol
- Hole dia.(ϕd_1) : φ 5.16mm
- Corner radius(r_ε)

Note: Cutting edge length (ℓ) is theoretical value for when corner radius is zero.

Applicable toolholder

ASBN R/L(P.6)
ASDN N(P.6)
ASSN R/L(P.6)
ASKN R/L(P.6)
A□□□-ASKN R/L(P.9)

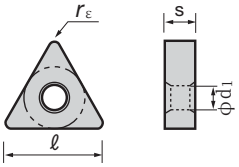
Application	Chipbreaker symbol	Appearance	f - a_p diagram	Insert Cat. No. (Metric)	Corner radius r_ε	Stocked grades: Coated T9005	T9015	T9025	T9035	T6020	T6030	T5105	T5115	T5125	Coated cermet GT720	GT730	Cermet NS730	T-CBN BXC30	BXC50			T-DIA DX120	DX140	DX160
Precision finishing	TF (M-class)			SNMG120404-TF	0.4											●	●							
				SNMG120408-TF	0.8											●	●							
Finishing	TSF (M-class)			SNMG120404-TSF	0.4	●	●	●	●							●							
				SNMG120408-TSF	0.8	●	●	●	●							●	●							
				SNMG120412-TSF	1.2	●	●	●	●															
	SS (M-class)			SNMG120404-SS	0.4					●	●													
				SNMG120408-SS	0.8					●	●													
				SNMG120412-SS	1.2					●	●													
	CF (M-class)			SNMG120408-CF	0.8							●	●											
				SNMG120412-CF	1.2							●	●											
Medium cutting	TM (M-class)			SNMG120404-TM	0.4	●	●	●	●		●					●	●						
				SNMG120408-TM	0.8	●	●	●	●		●					●	●							
				SNMG120412-TM	1.2	●	●	●	●		●													
				SNMG120416-TM	1.6		●	●	●		●													
	SM (M-class)			SNMG120408-SM	0.8					●	●													
				SNMG120412-SM	1.2					●	●													
	All-round groove (M-class)			SNMG120404	0.4	●	●	●	●			●	●	●	●	●	●							
				SNMG120408	0.8	●	●	●	●			●	●	●	●	●	●							
				SNMG120412	1.2	●	●	●	●			●	●	●		●	●							
				SNMG120416	1.6	●	●	●	●			●	●	●										
				SNMG120420	2.0	●	●	●	●			●	●	●										
	CM (M-class)			SNMG120408-CM	0.8							●	●	●										
				SNMG120412-CM	1.2							●	●	●										
Medium to heavy cutting	CH (M-class)			SNMG120408-CH	0.8							●	●	●										
				SNMG120412-CH	1.2							●	●	●										
				SNMG120416-CH	1.6							●	●	●										
	TH (M-class)			SNMG120408-TH	0.8	●	●	●	●		●													
				SNMG120412-TH	1.2	●	●	●	●		●													
Precision finishing	T-DIA (G-class)			SNGA120404-DIA	0.4																	●	●	●
				SNGA120408-DIA	0.8																	●	●	●
	T-CBN (G-class)			4QP-SNGA120404	0.4													●	●					
				4QP-SNGA120408	0.8													●	●					
				4QP-SNGA120412	1.2													●	●					

P Steels M Stainless steels K Cast irons N Nonferrous metals H Hard materials

● : Stocked in Japan

60 °Triangular, with hole Negative

TN□□1604



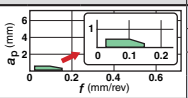
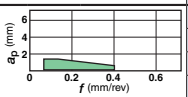
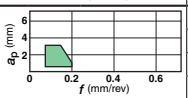
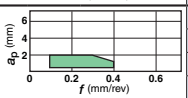
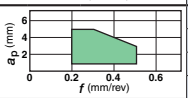
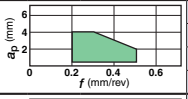
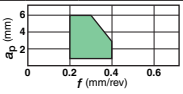
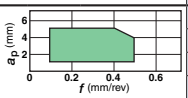
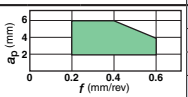
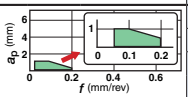
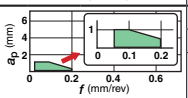
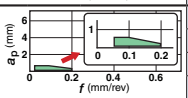
TN□□ 16 04 □□-□□

- 16: Cutting edge length (ℓ)=16.5mm
- 04: Thickness(s)=4.76mm
- □□-□□: Chipbreaker symbol
- Hole dia.(ϕd_1) : ϕ 3.81mm
- □□: Corner radius(r_ε)

Note: Cutting edge length (ℓ) is theoretical value for when corner radius is zero.

Applicable toolholder

ATJN R/L(P.5)
ATGN R/L(P.5)
ATFN R/L(P.5)
ATQN R/L(P.5)
A□□□-ATFN R/L(P.9)

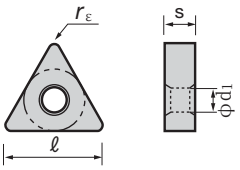
Application	Chipbreaker symbol	Appearance	f - a_p diagram	Insert Cat. No. (Metric)	Corner radius r_ε	Stocked grades: Coated T9005	T9015	T9025	T9035	T6020	T6030	T5105	T5115	T5125	Coated cermet GT720	GT730	Cermet NS730	T-CBN BXC30	BXC50			T-DIA DX120	DX140	DX160
Precision finishing	TF (M-class)			TNMG160404-TF	0.4										●	●	●							
				TNMG160408-TF	0.8										●	●	●							
Finishing	TSF (M-class)			TNMG160402-TSF	0.2											●	●							
				TNMG160404-TSF	0.4	●	●	●	●		●				●	●	●							
				TNMG160408-TSF	0.8	●	●	●	●		●				●	●	●							
				TNMG160412-TSF	1.2	●	●	●	●						●	●	●							
	SS (M-class)			TNMG160404-SS	0.4					●	●													
				TNMG160408-SS	0.8					●	●													
				TNMG160412-SS	1.2					●	●													
	CF (M-class)			TNMG160404-CF	0.4							●	●											
				TNMG160408-CF	0.8							●	●											
Medium cutting	TM (M-class)			TNMG160404-TM	0.4	●	●	●	●		●					●	●							
				TNMG160408-TM	0.8	●	●	●	●		●					●	●							
				TNMG160412-TM	1.2	●	●	●	●		●					●	●							
	SM (M-class)			TNMG160404-SM	0.4					●	●													
				TNMG160408-SM	0.8					●	●													
				TNMG160412-SM	1.2					●	●													
	All-round groove (M-class)			TNMG160404	0.4	●	●	●	●			●	●	●	●	●	●							
				TNMG160408	0.8	●	●	●	●			●	●	●	●	●	●							
				TNMG160412	1.2	●	●	●	●			●	●	●			●							
				TNMG160416	1.6	●	●	●	●			●	●	●										
				TNMG160420	2.0	●	●	●	●															
	CM (M-class)			TNMG160404-CM	0.4							●	●	●										
				TNMG160408-CM	0.8							●	●	●										
				TNMG160412-CM	1.2							●	●	●										
Medium to heavy cutting	CH (M-class)			TNMG160404-CH	0.4							●	●	●										
				TNMG160408-CH	0.8							●	●	●										
				TNMG160412-CH	1.2							●	●	●										
Precision finishing	T-DIA (G-class)			TNGA160404-DIA	0.4																		●	●
				TNGA160408-DIA	0.8																		●	●
	T-DIA (M-class) With rake angle			TNMM160402-DIA	0.2																	●		
				TNMM160404-DIA	0.4																	●		
	T-CBN (G-class)			6QP-TNGA160404	0.4													●	●					
				6QP-TNGA160408	0.8													●	●					
				6QP-TNGA160412	1.2													●	●					

P Steels M Stainless steels K Cast irons N Nonferrous metals H Hard materials

●: Stocked in Japan

60 °Triangular, with hole Negative

TN□□2204



TN□□ 22 04 □□-□□

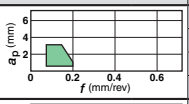
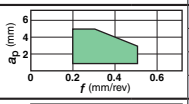
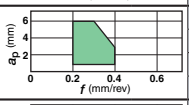
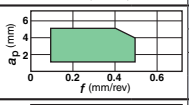
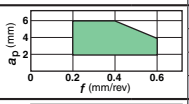
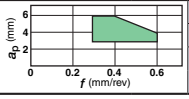
Cutting edge length(ℓ)=22mm | Thickness(s)=4.76mm | Chipbreaker symbol

Hole dia.(φd1) : φ 5.16mm | Corner radius(r_ε)

Note: Cutting edge length (ℓ) is theoretical value for when corner radius is zero.

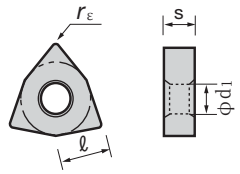
Applicable toolholder

ATGN R/L(P.5)
ATFN R/L(P.5)

Application	Chipbreaker symbol	Appearance	f - a_p diagram	Insert Cat. No. (Metric)	Corner radius r_ε	Stocked grades: Coated T9005	T9015	T9025	T9035	T6020	T6030	T5105	T5115	T5125	Coated cermet GT720	GT730	Cermet NS730	T-CBN BXC30	BXC50	T-DIA DX120	DX140	DX160
Finishing	SS (M-class)			TNMG220404-SS	0.4					●	●											
				TNMG220408-SS	0.8					●	●											
				TNMG220412-SS	1.2						●											
Medium cutting	TM (M-class)			TNMG220408-TM	0.8	●	●	●	●		●											
				TNMG220412-TM	1.2	●	●	●	●		●											
				TNMG220416-TM	1.6		●	●														
	All-round groove (M-class)			TNMG220408	0.8	●	●	●	●			●	●	●								
				TNMG220412	1.2	●	●	●	●			●	●	●								
				TNMG220416	1.6	●	●	●	●			●	●	●								
	CM (M-class)			TNMG220408-CM	0.8							●	●	●								
				TNMG220412-CM	1.2							●	●	●								
Medium to heavy cutting	CH (M-class)			TNMG220408-CH	0.8							●	●	●								
				TNMG220412-CH	1.2							●	●	●								
				TNMG220416-CH	1.6							●	●	●								
	TH (M-class)			TNMG220408-TH	0.8	●	●	●	●		●											
				TNMG220412-TH	1.2	●	●	●	●		●											

80 °Trigon, with hole Negative

WN□□0604



WN□□ 06 04 □□-□□

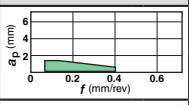
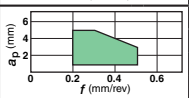
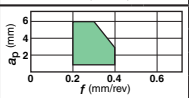
Cutting edge length(ℓ)=6.5mm | Thickness(s)=4.76mm | Chipbreaker symbol

Hole dia.(φd1) : φ 3.81mm | Corner radius(r_ε)

Note: Cutting edge length (ℓ) is theoretical value for when corner radius is zero.

Applicable toolholder

AWLN R/L(P.3)
A□□□-AWLN R/L(P.8)

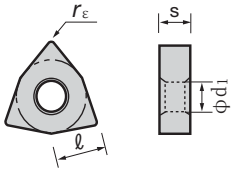
Application	Chipbreaker symbol	Appearance	f - a_p diagram	Insert Cat. No. (Metric)	Corner radius r_ε	Stocked grades: Coated T9005	T9015	T9025	T9035	T6020	T6030	T5105	T5115	T5125	Coated cermet GT720	GT730	Cermet NS730	T-CBN BXC30	BXC50	T-DIA DX120	DX140	DX160
Finishing	TSF (M-class)			WNMG060404-TSF	0.4		●	●														
				WNMG060408-TSF	0.8		●	●														
Medium cutting	TM (M-class)			WNMG060404-TM	0.4	●	●	●														
				WNMG060408-TM	0.8	●	●	●														
	All-round groove (M-class)			WNMG060404	0.4	●	●	●	●			●	●	●								
				WNMG060408	0.8	●	●	●	●			●	●	●								

P Steels | M Stainless steels | K Cast irons | N Nonferrous metals | H Hard materials

● : Stocked in Japan

80 °Trigon, with hole Negative

WN□□0804



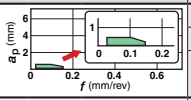
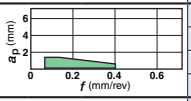
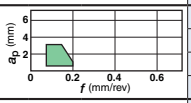
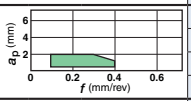
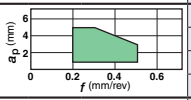
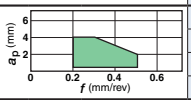
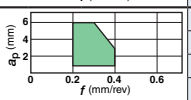
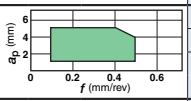
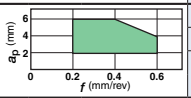
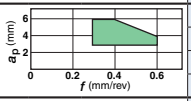
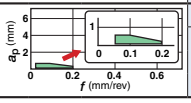
WN□□ 08 04 □□ - □□

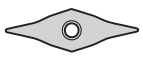
- 08: Cutting edge length (ℓ)=8.1mm
- 04: Thickness(s)=4.76mm
- □□: Chipbreaker symbol
- Hole dia.(φd1) : φ 5.16mm
- □□: Corner radius(r_ε)

Note: Cutting edge length (ℓ) is theoretical value for when corner radius is zero.

Applicable toolholder

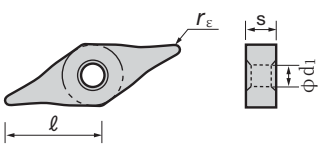
AWLN R/L(P.3)
A□□□-AWLN R/L(P.8)

Application	Chipbreaker symbol	Appearance	f - a_p diagram	Insert Cat. No. (Metric)	Corner radius r_ε	Stocked grades: Coated T9005	T9015	T9025	T9035	T6020	T6030	T5105	T5115	T5125	Coated cermet GT720	GT730	Cermet NS730	T-CBN BXC30	BXC50	T-DIA DX120	DX140	DX160
Precision finishing	TF (M-class)			WNMG080404-TF	0.4											●	●					
				WNMG080408-TF	0.8											●	●					
Finishing	TSF (M-class)			WNMG080404-TSF	0.4	●	●	●	●		●				●	●	●					
				WNMG080408-TSF	0.8	●	●	●	●		●					●	●					
				WNMG080412-TSF	1.2	●	●	●	●													
	SS (M-class)			WNMG080404-SS	0.4					●	●											
				WNMG080408-SS	0.8					●	●											
				WNMG080412-SS	1.2					●	●											
	CF (M-class)			WNMG080404-CF	0.4							●	●									
				WNMG080408-CF	0.8							●	●									
				WNMG080412-CF	1.2							●	●									
Medium cutting	TM (M-class)			WNMG080404-TM	0.4	●	●	●	●		●					●	●					
				WNMG080408-TM	0.8	●	●	●	●		●					●	●					
				WNMG080412-TM	1.2	●	●	●	●		●					●	●					
				WNMG080416-TM	1.6		●	●														
	SM (M-class)			WNMG080404-SM	0.4					●	●											
				WNMG080408-SM	0.8					●	●											
				WNMG080412-SM	1.2					●	●											
	All-round groove (M-class)			WNMG080404	0.4	●	●	●	●			●	●	●	●	●	●					
				WNMG080408	0.8	●	●	●	●			●	●	●	●	●	●					
				WNMG080412	1.2	●	●	●	●			●	●	●								
				WNMG080416	1.6	●	●	●	●			●	●	●								
	CM (M-class)			WNMG080408-CM	0.8							●	●	●								
				WNMG080412-CM	1.2							●	●	●								
Medium to heavy cutting	CH (M-class)			WNMG080408-CH	0.8							●	●	●								
				WNMG080412-CH	1.2							●	●	●								
	TH (M-class)			WNMG080408-TH	0.8	●	●	●	●		●											
				WNMG080412-TH	1.2	●	●	●	●		●											
				WNMG080416-TH	1.6	●	●	●	●		●											
Precision finishing	T-CBN (G-class)			6QP-WNGA080408	0.8													●	●			



25 °Rhombic, with hole Negativ

YN□□1604



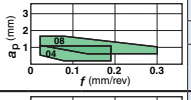
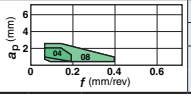
YN□□ 16 04 □□ - □□

- 16: Cutting edge length (ℓ)=16.6mm
- 04: Thickness(s)=4.76mm
- □□: Chipbreaker symbol
- Hole dia.(φd1) : φ 3.81mm
- □□: Corner radius(r_ε)

Note: Cutting edge length (ℓ) is theoretical value for when corner radius is zero.

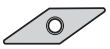
Applicable toolholder

AVJN R/L(P.7)
AVVN N(P.7)
AVQN R/L(P.7)
A□□□-AVCN R/L(P.9)

Application	Chipbreaker symbol	Appearance	f - a_p diagram	Insert Cat. No. (Metric)	Corner radius r_ε	Stocked grades: Coated T9005	T9015	T9025	T9035	T6020	T6030	T5105	T5115	T5125	Coated cermet GT720	GT730	Cermet NS730	T-CBN BXC30	BXC50	T-DIA DX120	DX140	DX160
Finishing to medium cutting	ZF (M-class)			YNMG160404-ZF	0.4			●								●						
				YNMG160408-ZF	0.8			●								●						
	ZM (M-class)			YNMG160404-ZM	0.4			●								●						
				YNMG160408-ZM	0.8			●								●						

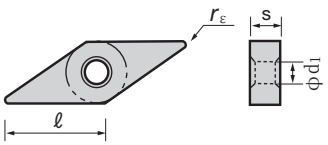
P Steels M Stainless steels K Cast irons N Nonferrous metals H Hard materials

● : Stocked in Japan



35 °Rhombic with hole Negative

VN□□1604



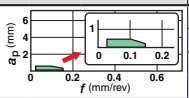
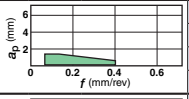
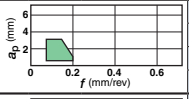
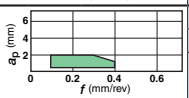
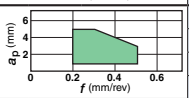
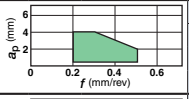
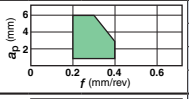
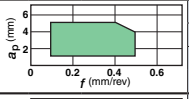
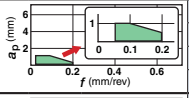
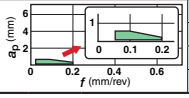
VN□□ 16 04 □□ - □□

- 16 → Cutting edge length (ℓ)=16.6mm
- 04 → Thickness(s)=4.76mm
- □□ → Corner radius (r_ε)
- □□ → Chipbreaker symbol
- Hole dia.(ϕd_1) : ϕ 3.81mm

Note: Cutting edge length (ℓ) is theoretical value for when corner radius is zero.

Applicable toolholder

AVJN R/L(P.7)
AVVN N(P.7)
AVQN R/L(P.7)
A□□□-AVCN R/L(P.9)

Application	Chipbreaker symbol	Appearance	f - a_p diagram	Insert Cat. No. (Metric)	Corner radius r_ε	Stocked grades: Coated T9005	T9015	T9025	T9035	T6020	T6030	T5105	T5115	T5125	Coated cermet GT720	GT730	Cermet NS730	T-CBN BXC30	BXC50	T-DIA DX120	DX140	DX160
Precision finishing	TF (M-class)			VNMG160404-TF	0.4										●	●	●					
				VNMG160408-TF	0.8										●	●	●					
Finishing	TSF (M-class)			VNMG160402-TSF	0.2											●	●					
				VNMG160404-TSF	0.4	●	●	●	●						●	●	●					
				VNMG160408-TSF	0.8	●	●	●	●						●	●	●					
				VNMG160412-TSF	1.2	●	●	●	●													
	SS (M-class)			VNMG160404-SS	0.4					●	●											
				VNMG160408-SS	0.8					●	●											
				VNMG160412-SS	1.2					●	●											
	CF (M-class)			VNMG160404-CF	0.4							●	●									
				VNMG160408-CF	0.8							●	●									
Medium cutting	TM (M-class)			VNMG160404-TM	0.4	●	●	●	●		●											
				VNMG160408-TM	0.8	●	●	●	●		●											
				VNMG160412-TM	1.2	●	●	●	●		●											
	SM (M-class)			VNMG160408-SM	0.8					●	●											
	All-round groove (M-class)			VNMG160404	0.4	●	●	●	●			●	●	●	●	●	●					
				VNMG160408	0.8	●	●	●	●			●	●	●	●	●	●					
				VNMG160412	1.2	●	●	●	●			●	●	●			●					
	CM (M-class)			VNMG160408-CM	0.8							●	●	●								
				VNMG160412-CM	1.2							●	●	●								
Precision finishing	T-DIA (M-class) With rake angle			VNMM160402-DIA	0.2															●		
				VNMM160404-DIA	0.4															●		
				VNMM160408-DIA	0.8															●		
	T-CBN (G-class)			4QP-VNGA160404	0.4													●	●			
				4QP-VNGA160408	0.8													●	●			
				4QP-VNGA160412	1.2																	

P Steels M Stainless steels K Cast irons N Nonferrous metals H Hard materials

●: Stocked in Japan

Tungaloy Corporation

Head Office
Solid Square, 580 Horikawa-cho, Saiwai-ku, Kawasaki City, 212-8503 Japan
Phone: +81-44-548-9500 Facsimile: +81-44-548-9540

International Sales & Marketing Division
2-7, Sugasawa-cho, Tsurumi-ku, Yokohama City, 230-0027 Japan
Phone: +81-45-503-9040 Facsimile: +81-45-503-9042
Sales of machining tools

Tungaloy America, Inc.
1226A Michael Drive, Wood Dale, IL.60191, U.S.A.
Phone: +1-630-227-3700 Facsimile: +1-630-227-0690
Sales of machining tools

Tungaloy de Mexico S.A.
C Los Arellano 113, Vista Alegre, Aguascalientes, AGS, Mexico 20290
Phone:+52-449-929-5410 Facsimile:+52-449-929-5411
Sales of machining tools

Tungaloy Europe GmbH
Elisabeth-Selbert-Strasse 3, 40764 Langenfeld, Germany
Phone: +49-2173-90420-0 Facsimile: +49-2173-90420-18
Sales of machining tools

Tungaloy France S.a.r.l.
6 Avenue des Andes, 91952 Courtaboeuf Cedex, France
Phone: +33-1-6486-4300 Facsimile: +33-1-6907-7817
Sales of machining tools

Tungaloy Italia S.p.A.
Via E. Andolfato 10, 20126 Milano, Italy
Phone: +39-02-252012-1 Facsimile: +39-02-252012-65
Sales of machining tools

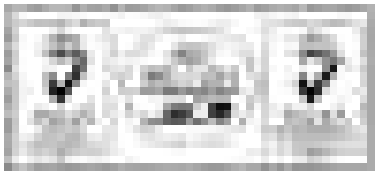
Tungaloy Central Europe s.r.o
4D Center Building B10F Kodanska 46 10100 Prauge 10 Czech Republic
Phone: +420-272652218 Facsimile: +420-234064270
Sales of machining tools

Tungaloy Cutting Tool (Shanghai) Co.,Ltd.
United Plaza 1505, 1468 Nan Jing Road West, Shanghai 200040, China
Phone: +86-21-6247-0512 Facsimile: +86-21-6289-1302
Sales of machining tools

Tungaloy Cutting Tool (Thailand) Co.,Ltd.
11th Floor, Sorachai Bldg. 23/7, Soi Sukhumvit 63,Klongtonnue, Wattana, Bangkok 10110, Thailand
Phone: +66-2-714-3130 Facsimile: +66-2-714-3134
Sales of machining tools

Tungaloy Singapore(Pte.),Ltd.
50 Kallang Avenue #06-03 Noel Corporate Building, Singapore 339505
Phone:+65-6391-1833 Facsimile:+65-6299-4557
Sales of machining tools

Distributed by:



ISO 9001 certified
QCOOJ0056
18/10/1996
Tungaloy Co.Ltd

ISO 14001 certified
EC97J1123
Production Division,
Tungaloy Co.Ltd