

Chapter Composition of Threading Tools

- ◆ Series are arranged as follows: SN-type threading tools for small diameter threads → ST-type threading tools → TT-type threading tools → Thread milling cutters
- ◆ In each series, toolholders and inserts are arranged by the thread types to be machined.

Figure of insert shape

Cat. No. of TAC threading inserts

Figure of thread to be machined

Thread type

ISO metric

Applicable toolholders

Full-profile inserts

Internal insert

External insert

Cat. No. of ST-type toolholders

Figure of main application

Product name of threading tools

Series name of threading tools

Size range of machinable threads

SN R/L

Internal threading

Screw-on

"Tsupari-Ichiban" shank

Steel shank

Carbide shank

Reference pages of relating items

Pitch or number of threads to be machined

Symbols of stock status

List of applicable toolholders

List of replacement parts

Lead angle

When using internal threading toolholders which are not shim-changeable type, select a proper lead angle depending on the thread size and type. 7-26

Ordering information

- When ordering a threading toolholder, please specify Cat. No. and quantity.
Example: **TSNR0020R22 1** piece.
- Standard packing quantity of threading toolholders is 1 piece.
- When ordering threading inserts, please specify Cat. No., grade, and quantity.
Example: **16IR15ISO T313V 15** pieces.
- Standard packing quantity of threading inserts is 5 pieces.

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Guidance

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7 Threading Tools

Products

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■ threading toolholders

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■ J series threading tools for small lathes

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■ Threading mills

● Threading mills (Single tooth type) for 60° threads	7-44
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Designation System for TAC Threading Tools

Inserts

1	2	3	4	5	6
16	I	R	175	ISO	B
1 Insert size	2 External or Internal	3 Hand of insert	4 Pitch (No. of threads)	5 Thread type	6 Chipbreaker
Symbol I. C. dia (mm)	E External I Internal	R Right hand L Left hand	Partial-profile inserts A Pitch: 0.5 ~ 1.5 mm TPI: 48 ~ 16 AG Pitch: 0.5 ~ 3.0 mm TPI: 48 ~ 8 G Pitch: 1.75 ~ 3.0 mm TPI: 14 ~ 8 N Pitch: 3.5 ~ 5.0 mm TPI: 7 ~ 5 Z Pitch: 4.0 ~ 6.0 mm TPI: 6 ~ 4 Full-profile inserts Metric thread: pitch (mm)×10 or 100 inch: TPI (TPI / 25.4 mm) (Examples) 05: 0.5 mm pitch×10 175: 1.75 mm pitch×100 14: 14 TPI / 25.4 mm	Partial-profile inserts 60° 60° thread angle 55° 55° thread angle TR 30° trapezoidal ACME 29° trapezoidal Full-profile inserts ISO Metric UN Unified W Whitworth PT JIS taper pipe NPT National pipe NPTF National pipe RAPI API round BAPI API buttress RD Round (DIN405) UNJ Aerospace	B With - Without
06 - 11 6.35 16 9.525 22 12.7 27 15.875					

Note: Please identify new designation system for internal inserts.
-i.e. "N" → "I"
(Example) Conventional: 16NR15ISO
New: 16IR15ISO

Toolholders for external threading

1	2	3	4	5	6	7	8
C	E	R	25	25	M	16	DT
1 Clamping method	2 External or Internal	3 Hand of tool	4 Height	5 Width	6 Length	7 Insert size	8
C Clamp-on S Screw-on	E External	R Right L Left	Shank size (mm) 4 Height	Shank size (mm) 5 Width	H 100 R 200 K 125 S 250 M 150 T 300 N 160 U 350 P 170 V 400	Symbol I. C. dia (mm) 06 - 11 6.35 16 9.525 22 12.7 27 15.875	T With offset DT With offset Usable as screw-on or clamp-on type

Toolholders for internal threading

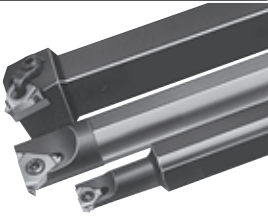
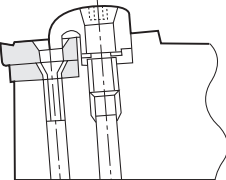
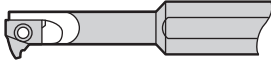
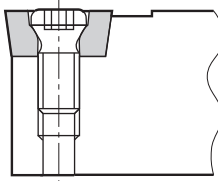

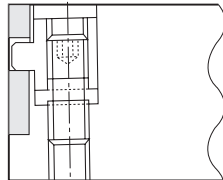


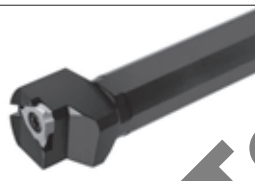
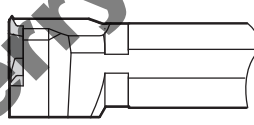

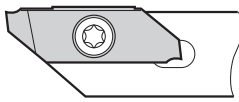
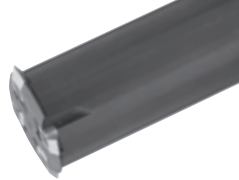
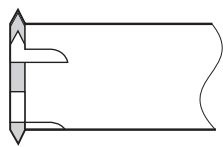
1	2	3	4	5	6	7	8	9	10
S	N	R	00	10	K	11	-DT	SC	-2
1 Clamping method	2 External or internal	3	4	5 Shank dia (mm)	6	7	8	9	10 Lead angle
TC "Tsuppari-Ichiban", clamp-on TS "Tsuppari-Ichiban", screw-on C Clamp-on S Screw-on	N Internal		00 For internal				DT With offset. Usable as screw-on or clamp-on type	SC Carbide shank	None 1° -2 2° -3 3°

Toolholders for gang tooling

A	1	2	3	B	6	7
B-	S	E	R	12	K	16
A	1	2	3	B	6	7
B- Single edge type BC- Combination type				Cutting edge height (mm)		

Threading Tool System

Clamping Mechanism and Features

Type	Appearance	Clamping mechanism	Features
ST Screw-on type Clamp-on type		 Clamp-on type shown	<ul style="list-style-type: none"> With the unique combination of the clamp and the mouth shape of the insert hole, the insert is held with precision accuracy. Specially designed chipbreakers are formed on the insert, achieving free flowing chip control for internal and external threading. A variety of insert shapes and sizes are available from stock. ▶ 7-19 ~
SN Screw-on type			<ul style="list-style-type: none"> Can be applied to internal threads of small diameters (down to M10). Full-profile inserts for metric (ISO), Whitworth, Taper pipe (PT) and American pipe (NPT) threads and partial-profile inserts for 60° and 55° thread angles are available as standard. ▶ 7-21
TT Pin type Screw-down			<ul style="list-style-type: none"> Specially designed clamp mechanism enables the insert to be held securely and accurately in the insert pocket. Both 55° and 60° included angles are available as standard stock items. Machinable pitch: $P \leq 3$ mm. Minimum machinable diameter for internal threading is $\phi 50$ mm. ▶ 7-40
JSTT Screw-on type			<ul style="list-style-type: none"> J series threading tools for use on small lathes. Toolholders are ground on four faces to maintain stability and accuracy. The insert is clamped with a both end torx screw, resulting in easy and rapid changing or indexing of the insert. Best suited for threading of small parts. Three corner type insert. Applicable for 55 and 60° threads of 0.5 to 1.0 mm pitches. ▶ 7-42
JS-TTL3 Screw-on type			<ul style="list-style-type: none"> J series threading tools for use on small lathes. Best suited for threading of small parts. Three corner type insert. Applicable for 55 and 60° threads of 0.5 to 1.0 mm pitches. ▶ 7-42
JSXB Screw-on type			<ul style="list-style-type: none"> J series threading tools for use on small lathes. Toolholders are ground on four faces to maintain stability and accuracy. The insert is clamped with a both end torx screw, resulting in easy and rapid changing or indexing of the insert. Best suited for threading of small parts. Two corner type insert. Applicable for 60° threads of 0.5 to 1.0 mm pitches. Usable for threading to corner. ▶ 7-43
Threading mills Single tooth type			<ul style="list-style-type: none"> TAC type threading mill. Suitable for machining large diameter threads. One thread mill with 60° corner inserts usable for a wide range of thread diameters. Used for helical feed threading and can produce high quality threads due to the elimination of chip recutting. ▶ 7-44

Thread Types and Applicable Inserts

Thread Types		ISO metric 60°	Unified 60°	General 60°	Whitworth 55°	General 55°	Parallel 55°	JIS taper pipe 55°						
		M M8 M8x1	UNC 3/8-16UNC UNF No.8-36UNF UNEF 1/4-32UNEF			W W3/4 W50/7			G G1/2 PF PF7 Rp Rp3/4 PS PS7	R R3/4 PT PT7 Rc Rc3/4				
		Pitch	TPI	Pitch	TPI	Pitch	TPI	Pitch	TPI	Pitch	TPI			
External thread	Partial-profile				0.5~1.5 0.5~3 1.75~3 0.5~3 4~6	48~16 48~8 14~8 7~5 6~4		0.5~1.5 0.5~3 1.75~3 0.5~3	48~16 48~8 14~8 7~5					
	Partial-profile with chip-breaker				0.5~1.5 0.5~3 1.75~3	48~16 48~8 14~8		0.5~3 1.75~3	7~5 14~8					
	Full-profile	0.5		(0.794)	32		(0.907)	28		(0.907)	28	(1.337)	19	
		0.75		(0.907)	28		(0.970)	26		(0.970)	26	(1.814)	14	
		1		(1.058)	24		(1.270)	20		(1.270)	20	(0.907)	28	
		1.25		(1.270)	20		(1.411)	18		(1.411)	18	(2.309)	11	
		1.5		(1.411)	18		(1.588)	16		(1.588)	16			
		1.75		(1.588)	16		(1.814)	14		(1.814)	14			
		2		(1.814)	14		(2.117)	12		(2.117)	12			
		2.5		(1.954)	13		(2.309)	11		(2.309)	11			
		3		(2.117)	12		(2.540)	10		(2.540)	10			
		3.5		(2.309)	11		(2.822)	9		(2.822)	9			
4		(2.540)	10		(3.175)	8		(3.175)	8					
Internal thread	Partial-profile				0.5~1.5 0.5~3 1.75~3 0.5~3 4~6	48~16 48~8 14~8 7~5 6~4		0.5~1.5 0.5~3 1.75~3 0.5~3	48~16 48~8 14~8 7~5					
	Partial-profile with chip-breaker				0.5~1.5 0.5~3 1.75~3	48~16 48~8 14~8		0.5~3 1.75~3	7~5 14~8					
	Full-profile	0.5		(0.794)	32		(1.337)	19	(1.337)	19	(1.337)	19	(1.337)	19
		0.75		(0.907)	28		(1.814)	14		(1.814)	14	(1.814)	14	
		1		(1.058)	24		(0.907)	28		(0.907)	28	(0.907)	28	
		1.25		(1.270)	20		(0.970)	26		(0.970)	26	(2.309)	11	
		1.5		(1.411)	18		(1.270)	20		(1.270)	20			
		1.75		(1.588)	16		(1.411)	18		(1.411)	18			
		2		(1.814)	14		(1.588)	16		(1.588)	16			
		2.5		(1.954)	13		(1.814)	14		(1.814)	14			
		3		(2.117)	12		(2.117)	12		(2.117)	12			
		3.5		(2.309)	11		(2.309)	11		(2.309)	11			
4		(2.540)	10		(2.540)	10		(2.540)	10					
Internal thread	Full-profile with chip-breaker	0.5		(1.058)	20		(1.337)	19		(1.337)	19	(1.337)	19	
	Full-profile	0.75		(1.270)	18		(1.588)	16		(1.588)	16	(1.814)	14	
		1		(1.411)	16		(1.814)	14		(1.814)	14	(2.309)	11	
		1.25		(1.588)	14		(2.309)	11		(2.309)	11			
		1.5		(1.814)	13									
		1.75		(1.954)	12									
		2		(2.117)	8									
		2.5		(3.175)										
		3												

* () is reference

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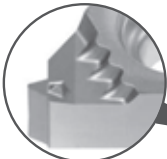

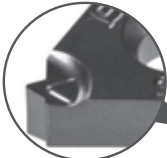

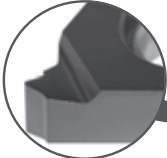

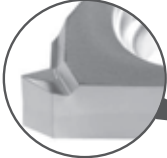
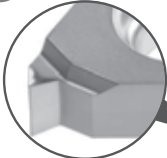


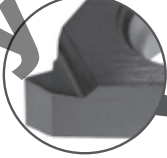
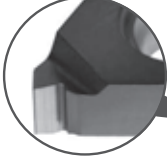
Thread Types and Applicable Inserts

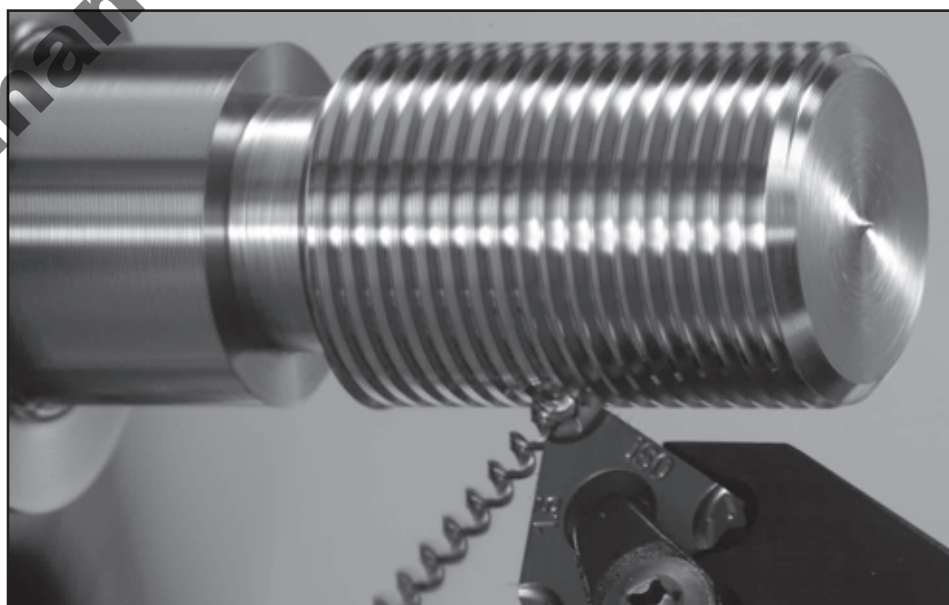
	American National Pipe 60°				Trapezoidal 30°		Trapezoidal 29°		Oil well pipe				Round DIN405		Aerospace			
	NPT 3/8-18NPT				NPTF		Tr Tr10x2 TM TM10		TW TW20 ACME 3/8-12ACME		RAPI		BAPI		Rd		UNJ	
	Pitch	TPI	Pitch	TPI	Pitch	TPI	Pitch	TPI	Pitch	TPI	Pitch	TPI	Pitch	TPI	Pitch	TPI		
Partial-profile					1.5 2 3 4 5 6		(2.117) (2.540) (3.175) (4.233) (5.080)	12 10 8 6 5										
Partial-profile with chip-breaker																		
Full-profile	(0.941) (1.411) (1.814) (2.209) (3.175)	27 18 14 11.5 8	(0.941) (1.411) (1.814) (2.209) (3.175)	27 18 14 11.5 8					(2.540) (3.175)	10 8	(2.540)	10				32 28 24 20 18 16 14 12 10 8		
Full-profile with chip-breaker	(1.411) (1.814) (2.209) (3.175)	18 14 11.5 8																
Partial-profile					1.5 2 3 4 5		(2.117) (2.540) (3.175) (4.233) (5.080)	12 10 8 6 5										
Partial-profile with chip-breaker																		
Full-profile	(0.941) (1.411) (1.814) (2.209) (3.175)	27 18 14 11.5 8	(1.814) (2.209) (3.175)	14 11.5 8					(2.540) (3.175)	10 8	(2.540)	10						
Full-profile with chip-breaker	(1.411) (1.814) (2.209) (3.175)	18 14 11.5 8																

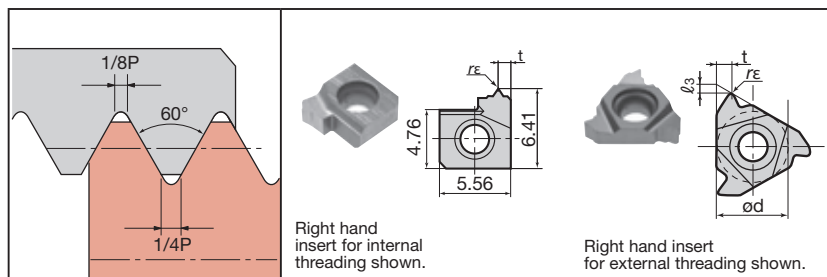
Partial-profile inserts

Full-profile inserts

Chipbreaker series

Insert type		Grades	External insert	Internal insert
Full-profile inserts	With chipbreaker	Cermet		
		Coated		
	Without chipbreaker	Coated, Coated carbide		
Partial-profile inserts	With chipbreaker	Cermet		
		Coated		
	Without chipbreaker	Coated, Coated carbide		





Applicable toolholders

Insert size	External	Internal
6		SNR/L000□K06SC-□ SNR/L000□H06-□
11		SNR/L000□11□□
16	CER/L000□16□□ B-SER/L000□16 B-CER/L000□16 BC-SER/L000□16	TSNR/L000□16 SNR/L000□16□□ TCNR/L000□16□□ CNR/L000□16□□
22	CER/L000□22□□	TSNR/L000□22 SNR/L000□22□□ TCNR/L000□22□□ CNR/L000□22□□
27	CER/L000□27□□	CNR/L000□27□□

Full-profile inserts

Insert size	Pitch	Number of threads	Hand of cut	External insert							Internal insert										
				Cat. No.	Grades			Dimensions (mm)				Cat. No.	Grades			Dimensions (mm)					
					Coated		Uncoated	ød	t	ℓ 3	r _E		Coated		Uncoated	ød	t	ℓ 3	r _E		
					AH725	T313V							TH10	AH725						T313V	TH10
6	0.75		R								6IR075ISO	●		●	-	0.5	-	0.05			
	1.0		R								6IR10ISO	●		●	-			0.07			
	1.25		R								6IR125ISO	●		●	-			0.09			
	1.5		R								6IR15ISO	●		●	-	0.9	-	0.11			
	1.75		R								6IR175ISO	●		●	-			0.12			
	2.0		R								6IR20ISO	●		●	-			0.14			
11	0.5		R								11IR05ISO	●		●	6.35	0.5	1.2	0.04			
	0.75		R								11IR075ISO	●		●				0.05			
	1.0		R								11IR10ISO	●	●	●				0.07			
			L								11IL10ISO	●									
	1.25		R								11IR125ISO	●						0.09			
			L								11IL125ISO	●									
	1.5		R								11IR15ISO	●	●	●		0.9	0.7	0.11			
			L								11IL15ISO	●									
	1.75		R								11IR175ISO	●	●					0.12			
			L								11IL175ISO	●									
2.0		R								11IR20ISO	●	●				0.14					
		L								11IL20ISO	●										
16	0.5		R	16ER05ISO	●		●	9.525	0.5	1.2	0.06	16IR05ISO	●		9.525	0.5	1.2	0.04			
	0.75		R	16ER075ISO	●	●	●				0.09	16IR075ISO	●						0.05		
	1.0		R	16ER10ISO	●	●	●				0.13	16IR10ISO	●	●				●	0.07		
			L	16EL10ISO								16IL10ISO	●								
	1.25		R	16ER125ISO	●	●					0.16	16IR125ISO	●						0.09		
			L	16EL125ISO								16IL125ISO	●								
	1.5		R	16ER15ISO	●	●	●				0.19	16IR15ISO	●	●				●	0.11		
			L	16EL15ISO								16IL15ISO	●								
	1.75		R	16ER175ISO	●	●					0.22	16IR175ISO	●	●					0.12		
			R	16ER20ISO	●	●	●					0.25	16IR20ISO	●				●		●	0.14
	2.0		L	16EL20ISO	●						0.31	16IL20ISO	●						1.6	1.2	
			R	16ER25ISO	●	●	●					0.38	16IR25ISO	●				●			●
	2.5		R	16ER30ISO	●	●	●					16IR30ISO	●	●				●	0.21		
			L	16EL30ISO								16IL30ISO	●								
22	3.5		R	22ER35ISO	●	●	12.7	2.5	1.7	0.44	22IR35ISO	●	●	12.7	2.5	1.7	0.25				
	4.0		R	22ER40ISO	●	●				0.50	22IR40ISO	●	●				0.28				
	4.5		R	22ER45ISO	●					0.56	22IR45ISO	●					0.32				
	5.0		R	22ER50ISO	●	●				0.63	22IR50ISO	●	●				0.35				
27	6.0		R	27ER60ISO	●	●		15.875	3.2	2.2	0.75	27IR60ISO	●	●		15.875	3.2	2.2	0.42		

Note: There are different dimensions of "l3" and "t" with the M class insert with chip breaker (AH725) – ONLY 16 SIZE. Please be aware of these differences.

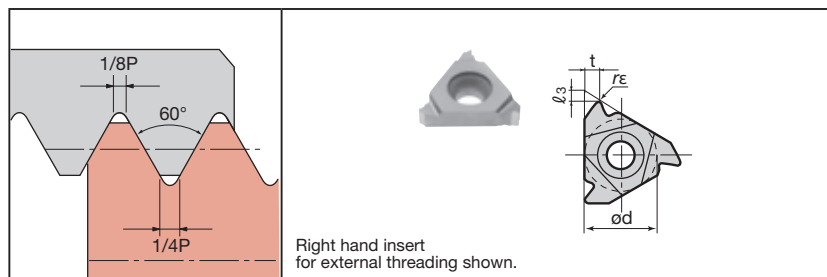
◆● : Stocked items. / Packing Quantity = 5 pcs.



Insert size	External	Internal
6		SNR/L0000□K06SC-□ SNR/L0000□H06-□
11		SNR/L□□□□□11□□
16	CER/L□□□□□16□□ B-SER/L□□□□16 B-CER/L□□□□16 BC-SER/L□□□□16	TSNR/L□□□□□16 SNR/L□□□□□16□□ TCNR/L□□□□□16□□ CNR/L□□□□□16□□
22	CER/L□□□□□22□□	TSNR/L□□□□□22 SNR/L□□□□□22□□ TCNR/L□□□□□22□□ CNR/L□□□□□22□□
27	CER/L□□□□□27□	CNR/L□□□□□27□

Insert size	Pitch	Number of threads	Hand of cut	External insert								Internal insert							
				Cat. No.	Grades		Dimensions (mm)				Cat. No.	Grades		Dimensions (mm)					
					Coated	Uncoated	ød	t	ℓ ₃	r _E		Coated	Uncoated	ød	t	ℓ ₃	r _E		
					AH725	NS730						AH725	NS730						
11	0.5		R							11IR05ISO-B	●	●	6.35	0.5	1.2	0.04			
	0.75		R							11IR075ISO-B	●	●				0.05			
	1.0		R							11IR10ISO-B	●	●				0.08			
	1.25		R							11IR125ISO-B	●	●				0.10			
	1.5		R							11IR15ISO-B	●	●				0.12			
	1.75		R							11IR175ISO-B	●	●				0.12			
	2.0		R							11IR20ISO-B	●	●				0.14			
16	0.5		R	16ER05ISO-B	●	9.525	0.5	1.2	0.06	16IR10ISO-B			9.525						
	0.75		R	16ER075ISO-B	◆		●	0.6	0.6		0.08								
	1.0		R	16ER10ISO-B	◆		●	0.5	1.2		0.09	◆					●		
								0.7	0.7		0.11								
	1.25		R	16ER125ISO-B	◆		●	0.9	0.7		0.13	◆					●		
								0.9	0.8		0.14								
	1.5		R	16ER15ISO-B	◆		●	0.9	0.7		0.16	◆					●		
								1.0	0.8		0.19							16IR15ISO-B	◆
	1.75		R	16ER175ISO-B	◆		●	0.9	0.7		0.19	◆					●		
								1.2	0.9		0.20							16IR175ISO-B	◆
	2.0		R	16ER20ISO-B	◆		●	1.6	1.2		0.22	◆					●		
								1.3	1.0		0.24							16IR20ISO-B	◆
	2.5		R	16ER25ISO-B	◆		●	1.6	1.2		0.25	◆					●		
								1.5	1.1		0.30							16IR25ISO-B	◆
	3.0		R	16ER30ISO-B	◆		●	1.6	1.2		0.31	◆					●		
1.6						1.2		0.38	16IR30ISO-B	◆									
1.6						1.2		0.38											

◆● : Stocked items. / Packing Quantity = 5 pcs.



Applicable toolholders

Insert size	External	Internal
11		SNR/L□□□□□11□□
16	CER/L□□□□□16□□ B-SER/L□□□□16 B-CER/L□□□□16 BC-SER/L□□□□16	TSNR/L□□□□□16 SNR/L□□□□□16□□ TCNR/L□□□□□16□□ CNR/L□□□□□16□□
22	CER/L□□□□□22□□	TSNR/L□□□□□22 SNR/L□□□□□22□□ TCNR/L□□□□□22□□ CNR/L□□□□□22□□

Full-profile inserts

Insert size	Pitch (Reference)	Number of threads	Hand of cut	External insert							Internal insert						
				Cat. No.	Grades		Dimensions (mm)				Cat. No.	Grades		Dimensions (mm)			
					Coated		ød	t	ℓ ₃	r _E		Coated		ød	t	ℓ ₃	r _E
					AH725	T313V						AH725	T313V				
11	(0.794)	32	R							11IR32UN	●		6.35	0.5	1.2	0.06	
	(0.907)	28	R							11IR28UN	●					0.06	
	(1.058)	24	R							11IR24UN	●					0.07	
	(1.270)	20	R							11IR20UN	●					0.09	
	(1.411)	18	R							11IR18UN	●	0.9				0.7	0.10
	(1.588)	16	R							11IR16UN	●						0.11
	(1.814)	14	R							11IR14UN	●						0.13
16	(0.794)	32	R	16ER32UN	●		0.5	1.2	0.10	16IR32UN	●		0.5	1.2	0.06		
	(0.907)	28	R	16ER28UN	●				0.11	16IR28UN	●				0.06		
	(1.058)	24	R	16ER24UN	●		0.9	0.7	0.13	16IR24UN	●		0.9	0.7	0.07		
	(1.270)	20	R	16ER20UN	●				0.16	16IR20UN	●				0.09		
	(1.411)	18	R	16ER18UN	●		0.18	16IR18UN	●		0.10						
	(1.588)	16	R	16ER16UN	●	●	0.20	16IR16UN	●	●	0.11						
	(1.814)	14	R	16ER14UN	●	●	9.525	0.23	16IR14UN	●	●	9.525			0.13		
	(1.954)	13	R	16ER13UN	●			0.24	16IR13UN	●					0.14		
	(2.117)	12	R	16ER12UN	●	●	0.27	16IR12UN	●	●	0.15						
	(2.309)	11	R	16ER11UN	●		1.6	1.2	0.29	16IR11UN	●		1.6	1.2	0.16		
	(2.540)	10	R	16ER10UN	●				0.32	16IR10UN	●				0.18		
	(2.822)	9	R	16ER9UN	●				0.35	16IR9UN	●				0.20		
	(3.175)	8	R	16ER8UN	●	●			0.40	16IR8UN	●	●			0.22		
22	(3.629)	7	R	22ER7UN	●		12.7	2.5	1.7	0.45	22IR7UN	●	12.7	2.5	1.7	0.25	
	(4.233)	6	R	22ER6UN	●					0.53	22IR6UN	●					0.30
	(5.080)	5	R	22ER5UN	●					0.64	22IR5UN	●					0.36

Full-profile inserts with chipbreaker

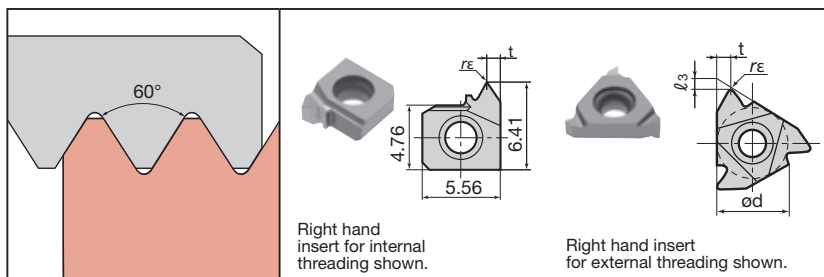
Insert size	Pitch (Reference)	Number of threads	Hand of cut	External insert							Internal insert									
				Cat. No.	Grades		Dimensions (mm)				Cat. No.	Grades		Dimensions (mm)						
					Coated AH725	Cermet NS730	ød	t	ℓ ₃	r _E		Coated AH725	Cermet NS730	ød	t	ℓ ₃	r _E			
16	(1.058)	24	R	16ER24UN-B	◆	●	9.525	0.8	0.7	0.11										
								0.9	0.7	0.13										
	(1.270)	20	R	16ER20UN-B	◆	●			0.9	0.8	0.14	16IR20UN-B	◆		9.525	0.9	0.8	0.06		
								0.9	0.7	0.16			●			0.9	0.7	0.09		
	(1.411)	18	R	16ER18UN-B	◆	●			1.0	0.8	0.15	16IR18UN-B	◆				1.0	0.8	0.07	
									0.9	0.7	0.18	16IR18UN-B		●			0.9	0.7	0.10	
	(1.588)	16	R	16ER16UN-B	◆	●			1.1	0.9	0.19	16IR16UN-B	◆				1.1	0.9	0.09	
									0.9	0.7	0.20	16IR16UN-B		●			0.9	0.7	0.11	
	(1.814)	14	R	16ER14UN-B	◆	●			1.2	1.0	0.22	16IR14UN-B	◆				1.2	0.9	0.10	
									1.6	1.2	0.23	16IR14UN-B		●			1.6	1.2	0.13	
	(1.954)	13	R	16ER13UN-B	◆				1.3	1.0	0.24									
	(2.117)	12	R	16ER12UN-B	◆	●			1.4	1.1	0.25	16IR12UN-B	◆			9.525	1.4	1.1	0.12	
									1.6	1.2	0.27			●				1.6	1.2	0.15
	(3.175)	8	R	16ER8UN-B	◆	●			1.6	1.2	0.41	16IR8UN-B	◆					1.5	1.1	0.19
									1.6	1.2	0.40			●				1.6	1.2	0.22

Note: ◆Please be aware of the different dimensions regarding "t" & "l₃".

Required to modify the position of the cutting edge.

Target designation for the replacement of shim.

◆◆ : Stocked items. / Packing Quantity = 5 pcs.



Applicable toolholders

Insert size	External	Internal
6		SNR/L000□K06SC-□ SNR/L000□H06-□
11		SNR/L□□□□□11□□
16	CER/L□□□□□16□□ B-SER/L□□□□16 B-CER/L□□□□16 BC-SER/L□□□□16	TSNR/L□□□□□16 SNR/L□□□□□16□□ TCNR/L□□□□□16□□ CNR/L□□□□□16□□
22	CER/L□□□□□22□□	TSNR/L□□□□□22 SNR/L□□□□□22□□ TCNR/L□□□□□22□□ CNR/L□□□□□22□□
27	CER/L□□□□□27□□	CNR/L□□□□□27□□

Partial-profile inserts

Insert size	Pitch	Number of threads	Hand of cut	External insert								Internal insert							
				Cat. No.	Grades			Dimensions (mm)				Cat. No.	Grades			Dimensions (mm)			
					Coated		Uncoated	ød	t	ℓ 3	r _E		Coated		Uncoated	ød	t	ℓ 3	r _E
					AH725	T313V	TH10						AH725	T313V	TH10				
6	0.5~1.5	48~16	R									6IRA60	●				0.9	-	0.04
11	0.5~1.5	48~16	R									11IRA60	●	●	●	6.35	0.9	0.7	0.04
			L							11ILA60	●	●	●						
16	0.5~1.5	48~16	R	16ERA60	●	●	●	9.525	0.9	0.7	0.06	16IRA60	●	●	●	9.525	0.9	0.7	0.04
			L	16ELA60	●	●	●		0.9	0.7	0.06	16ILA60	●	●	●				
	0.5~3.0	48~8	R	16ERAG60	●	●			1.6	1.2	0.06	16IRAG60	●	●			1.6	1.2	0.04
			L	16ERG60	●	●	●		1.6	1.2	0.22	16IRG60	●	●	●				
	1.75~3	14~8	L	16ELG60	●	●			0.5	1.2	0.22	16ILG60	●	●	●		0.12		
22	3.5~5	7~5	R	22ERN60	●	●	●	12.7	0.5	1.2	0.44	22IRN60	●	●	●	12.7	2.5	1.7	0.25
			L	22ELN60	●	●			0.5	1.2	0.44	22ILN60	●	●					
27	4~6	6~4	R	27ERZ60	●	●		15.875	0.9	0.7	0.50	27IRZ60	●	●		15.875	3.2	2.2	0.28

Partial-profile inserts with chipbreaker

Insert size	Pitch	Number of threads	Hand of cut	External insert								Internal insert							
				Cat. No.	Grades		Dimensions (mm)				Cat. No.	Grades		Dimensions (mm)					
					Coated AH725	Cermet NS730	ød	t	ℓ ₃	r _E		Coated AH725	Cermet NS730	ød	t	ℓ ₃	r _E		
11	0.5~1.5	48~16	R							11IRA60-B	●	●	6.35	0.9	0.7	0.04			
16	0.5~1.5	48~16	R	16ERA60-B	◆	9.525	0.9	0.8	0.05	16IRA60-B	◆		9.525	0.9	0.8	0.05			
				16ERA60-B			●	0.9	0.7	0.06	16IRA60-B			●	1.6	1.1	0.04		
	0.5~3.0	48~8	R	16ERAG60-B	◆			●	1.7	1.2	0.06	16IRAG60-B		◆		1.7	1.2	0.05	
				16ERAG60-B			●	1.6	1.1	0.06	16IRAG60-B			●	1.6	1.2	0.04		
	1.75~3.0	14~8	R	16ERG60-B	◆			1.7	1.2	0.17	16IRG60-B	◆			1.7	1.2	0.10		
				16ERG60-B			●	1.6	1.2	0.22	16IRG60-B			●	1.6	1.2	0.14		

Note: ◆ Please be aware of the different dimensions regarding "t" & "ℓ₃".

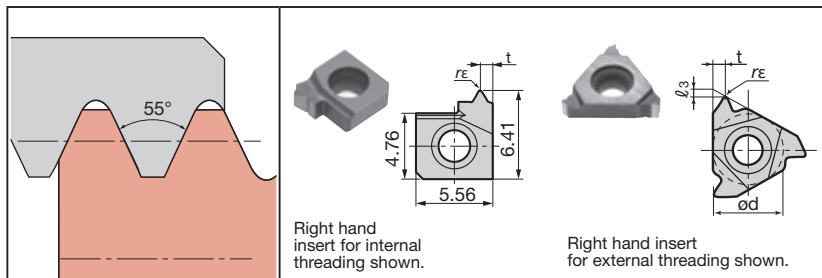
Required to modify the position of the cutting edge.

Target designation for the replacement of shim.

◆● : Stocked items. / Packing Quantity = 5 pcs.

TUNGTHREAD

55° Whitworth



Applicable toolholders

Insert size	External	Internal
6		SNR/L000□K06SC-□ SNR/L000□H06-□
11		SNR/L000□11□□
16	CER/L000□16□□ B-SER/L000□16 B-CER/L000□16 BC-SER/L000□16	TSNR/L000□16 SNR/L000□16□□ TCNR/L000□16□□ CNR/L000□16□□
22	CER/L000□22□□	TSNR/L000□22 SNR/L000□22□□ TCNR/L000□22□□ CNR/L000□22□□

Full-profile inserts

Insert size	Pitch (Reference)	Number of threads	Hand of cut	External insert								Internal insert							
				Cat. No.	Grades		Dimensions (mm)				Cat. No.	Grades		Dimensions (mm)					
					Coated	Uncoated	ød	t	ℓ ₃	r _E		Coated	Uncoated	ød	t	ℓ ₃	r _E		
																		AH725	T313V
6	(1.337)	19	R								6IR19W	●			0.9	-	0.17		
11	(1.337)	19	R								11IR19W	●	●	●	6.35	0.9	0.7	0.17	
	(1.814)	14	R								11IR14W	●	●	●				0.23	
16	(0.907)	28	R	16ER28W	●	●	0.9	0.7	0.11	16IR28W	●			0.9	0.7	0.9	1.2	0.11	
	(0.97)	26	R	16ER26W	●					0.12	16IR26W	●							0.12
	(1.27)	20	R	16ER20W	●					0.16	16IR20W	●							0.16
	(1.337)	19	R	16ER19W	●	●				0.17	16IR19W	●							0.17
	(1.411)	18	R	16ER18W	●					0.18	16IR18W	●							0.18
	(1.588)	16	R	16ER16W	●	●				0.20	16IR16W	●	●						0.20
	(1.814)	14	R	16ER14W	●	●	●	9.525	0.23	16IR14W	●	●	●	9.525	1.6	1.2	0.23		
			L	16EL14W	●														
	(2.117)	12	R	16ER12W	●	●	1.6	1.2	0.27	16IR12W	●	●		1.6	1.2	1.7	0.27		
	(2.309)	11	R	16ER11W	●	●			●	0.29	16IR11W	●	●				●	0.29	
	(2.54)	10	R	16ER10W	●	●				0.32	16IR10W	●	●					0.32	
	(2.822)	9	R	16ER9W	●					0.35	16IR9W	●						0.35	
(3.175)	8	R	16ER8W	●	●				0.40	16IR8W	●	●					0.40		
(3.629)	7	R	22ER7W	●					0.45	22IR7W	●						0.45		
22	(4.233)	6	R	22ER6W	●		12.7	2.5	1.7	0.53	22IR6W	●		12.7	2.5	1.7	0.53		
	(5.08)	5	R	22ER5W	●					0.64	22IR5W	●					0.64		

Full-profile inserts with chipbreaker

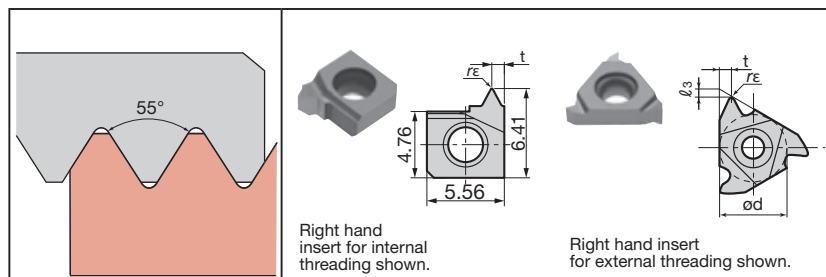
Insert size	Pitch (Reference)	Number of threads	Hand of cut	External insert								Internal insert							
				Cat. No.	Grades		Dimensions (mm)				Cat. No.	Grades		Dimensions (mm)				Cat. No.	Pitch (Reference)
					Coated	Cermet	ød	t	ℓ ₃	r _E		Coated	Cermet	ød	t	ℓ ₃	r _E		
16	(1.337)	19	R	16ER19W-B	◆	●		1.0	0.8	0.16									
						●		0.9	0.7	0.17	161R19W-B		●		0.9	0.7	0.17		
	(1.588)	16	R	16ER16W-B	◆			1.1	0.9	0.20	161R16W-B	◆			1.1	0.9	0.20		
	(1.814)	14	R	16ER14W-B	◆			1.2	1.0	0.24	161R14W-B	◆			1.2	1.0	0.23		
						●		1.6	1.2	0.23	161R14W-B		●		1.6	1.2	0.23		
	(2.309)	11	R	16ER11W-B	◆			1.5	1.1	0.31	161R11W-B	◆			1.5	1.1	0.30		
						●		1.6	1.2	0.29			●		1.6	1.2	0.29		

Note: ◆Please be aware of the different dimensions regarding "t" & "ℓ₃".

Required to modify the position of the cutting edge.

Target designation for the replacement of shim.

◆● : Stocked items. / Packing Quantity = 5 pcs.



■ Applicable toolholders

Insert size	External	Internal
6		SNR/L000□K06SC-□ SNR/L000□H06-□
11		SNR/L□□□□□11□□
16	CER/L□□□□□16□□ B-SER/L□□□□16 B-CER/L□□□□16 BC-SER/L□□□□16	TSNR/L□□□□□16 SNR/L□□□□□16□□ TCNR/L□□□□□16□□ CNR/L□□□□□16□□
22	CER/L□□□□□22□□	TSNR/L□□□□□22 SNR/L□□□□□22□□ TCNR/L□□□□□22□□ CNR/L□□□□□22□□

■ Partial-profile inserts

Insert size	Pitch	Number of threads	Hand of cut	External insert								Internal insert							
				Cat. No.	Grades			Dimensions (mm)				Cat. No.	Grades			Dimensions (mm)			
					Coated		Uncoated	ød	t	ℓ 3	r _E		Coated		Uncoated	ød	t	ℓ 3	r _E
					AH725	T313V	TH10						AH725	T313V	TH10				
6	0.5~1.5	48~16	R								6IRA55	●		●	-	0.9	-	0.07	
11	0.5~1.5	48~16	R								11IRA55	●	●	●	6.35	0.9	0.7	0.07	
16	0.5~1.5	48~16	R	16ERA55	●	●	●	9.525	0.9	0.7	0.07	16IRA55	●	●	●	9.525	0.9	0.7	0.07
	0.5~3.0	48~8	R	16ERAG55	●				1.7	1.2	0.07	16IRAG55					1.7	1.2	0.07
	1.75~3.0	14~8	R	16ERG55	●	●	●		1.6	1.2	0.25	16IRG55	●	●	●		1.7	1.2	0.25
22	0.5~3.0	7~5	R	22ERN55	●	●	●	12.7	2.5	1.7	0.50	22IRN55	●	●	●	12.7	2.5	1.7	0.50

■ Partial-profile inserts with chipbreaker

Insert size	Pitch	Number of threads	Hand of cut	External insert							Internal insert						
				Cat. No.	Grades	Dimensions (mm)				Cat. No.	Grades	Dimensions (mm)					
					Coated	ød	t	ℓ ₃	r _E		Coated	ød	t	ℓ ₃	r _E		
					AH725						AH725						
16	0.5~3.0	48~8	R	16ERAG55-B	◆	9.525	1.7	1.2	0.06	16IRAG55-B	◆	9.525	1.7	1.2	0.07		
	1.75~3.0	14~8	R	16ERG55-B	◆				0.23	16IRG55-B	◆				0.22		

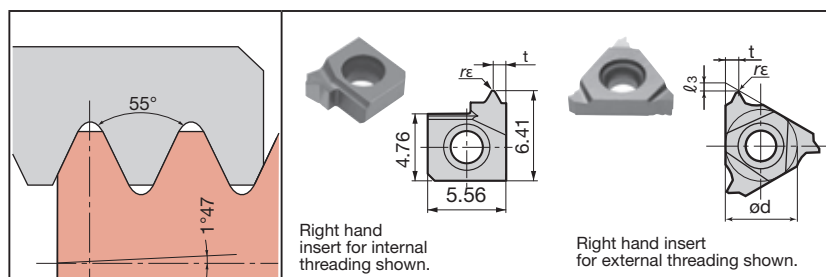
Note: ◆Please be aware of the different dimensions regarding "t" & "l₃".

Required to modify the position of the cutting edge.

Target designation for the replacement of shim.

◆● : Stocked items. / Packing Quantity = 5 pcs.

PT JIS Taper pipe



Applicable toolholders

Insert size	External	Internal
6		SNR/L000□K06SC-□ SNR/L000□H06-□
11		SNR/L000□□11□□
16	CER/L000□□16□□ B-SER/L000□16 B-CER/L000□16 BC-SER/L000□16	TSNR/L000□□16 SNR/L000□□16□□ TCNR/L000□□16□□ CNR/L000□□16□□

Full-profile inserts

Insert size	Pitch (Reference)	Number of threads	Hand of cut	External insert						Internal insert									
				Cat. No.	Grades			Dimensions (mm)				Cat. No.	Grades			Dimensions (mm)			
					Coated		Uncoated	ød	t	ℓ ₃	r _E		Coated		Uncoated	ød	t	ℓ ₃	r _E
					AH725	T313V	TH10						AH725	T313V	TH10				
6	(1.337)	19	R								61R19PT	●		●		0.9	-	0.14	
11	(1.337)	19	R								111R19PT	●	●	●	6.35	0.9	0.7	0.14	
	(1.814)	14	R								111R14PT	●	●	●				0.16	
16	(0.907)	28	R	16ER28PT	●	●	9.525	0.9	0.7	0.09					9.525	0.9	0.7	0.14	
	(1.337)	19	R	16ER19PT	●	●						0.14	161R19PT	●					
	(1.814)	14	R	16ER14PT	●	●				0.16	161R14PT	●	●	●			1.6	1.2	0.16
	(2.309)	11	R	16ER11PT	●	●				0.26	161R11PT	●	●	●				0.26	

Full-profile inserts with chipbreaker

Insert size	Pitch (Reference)	Number of threads	Hand of cut	External insert					Internal insert								
				Cat. No.	Grades		Dimensions (mm)				Cat. No.	Grades		Dimensions (mm)			
					Coated AH725	Cermet NS730	ød	t	ℓ ₃	r _ε		Coated AH725	Cermet NS730	ød	t	ℓ ₃	r _ε
16	(1.337)	19	R	16ER19PT-B		●	9.525	0.9	0.7	0.18	16IR19PT-B		●	9.525	0.9	0.7	0.18
	(1.814)	14	R	16ER14PT-B	◆	●		1.2	1	-	16IR14PT-B	◆	●		1	0.9	-
					1.6	1.2		0.25	16IR14PT-B	●	1.6	1.2	0.25				
	(2.309)	11	R	16ER11PT-B	◆	●		1.5	1.1	-	16IR11PT-B	◆	●		1.5	1.1	-
					●			1.6	1.2	0.32		●			1.6	1.2	0.32

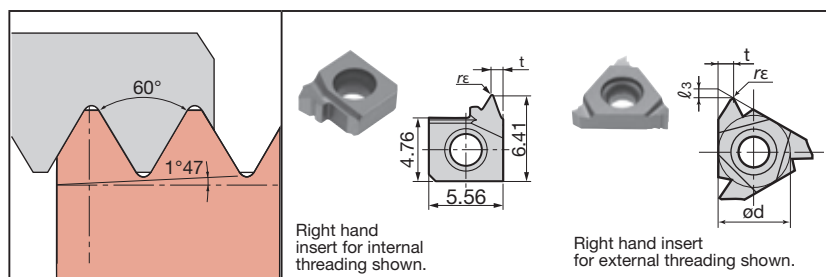
Note: ◆Please be aware of the different dimensions regarding "t" & "ℓ₃".

Required to modify the position of the cutting edge.

Target designation for the replacement of shim.

◆● : Stocked items. / Packing Quantity = 5 pcs.

NPT American National Pipe



Applicable toolholders

Insert size	External	Internal
6		SNR/L000□K06SC-□ SNR/L000□H06-□
16	CER/L□□□□□16□□ B-SER/L□□□□16 B-CER/L□□□□16 BC-SER/L□□□□16	TSNR/L□□□□□16 SNR/L□□□□□16□□ TCNR/L□□□□□16□□ CNR/L□□□□□16□□

Full-profile inserts

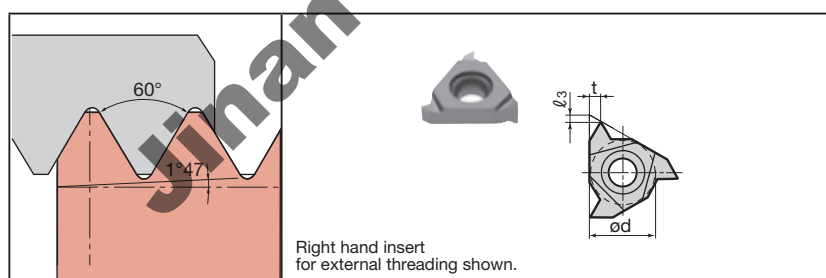
Insert size	Pitch (Reference)	Number of threads	Hand of cut	External insert								Internal insert																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
				Cat. No.	Grades			Dimensions (mm)				Cat. No.	Grades			Dimensions (mm)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
					Coated	Uncoated	AH725	T313V	TH10	ød	t		ℓ ₃	r _ε	Coated	Uncoated	AH725	T313V	TH10	ød	t	ℓ ₃	r _ε																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
6	(1.411)	18	R																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										

Full-profile inserts with chipbreaker

Insert size	Pitch (Reference)	Number of threads	Hand of cut	External insert							Internal insert						
				Cat. No.	Grades		Dimensions (mm)				Cat. No.	Grades		Dimensions (mm)			
					Coated AH725	Cermet NS730	ød	t	ℓ ₃	r _E		Coated AH725	Cermet NS730	ød	t	ℓ ₃	r _E
16	(1.411)	18	R	16ER18NPT-B	◆	●	9.525	1	0.8	-	16IR18NPT-B		●	9.525	0.9	0.7	0.07
	(1.814)	14	R	16ER14NPT-B	◆	●		1.2	0.9	-	16IR14NPT-B	◆			1.5	1.1	-
					●	1.6		1.2	0.08	16IR14NPT-B		●	1.6		1.2	0.08	
	(2.209)	11.5	R	16ER115NPT-B	◆	●		1.5	1.1	-	16IR115NPT-B	◆			1.2	0.9	-
					●	1.6		1.2	0.09	16IR115NPT-B		●	1.6		1.2	0.09	
	(3.175)	8	R	16ER8NPT-B	◆	▲		1.8	1.3	-	16IR8NPT-B	◆			1.8	1.3	-

Note: ◆ Please be aware of the different dimensions regarding "t" & "ℓ₃". Required to modify the position of the cutting edge. ● Target designation for the replacement of shim.

NPTF



Applicable toolholders

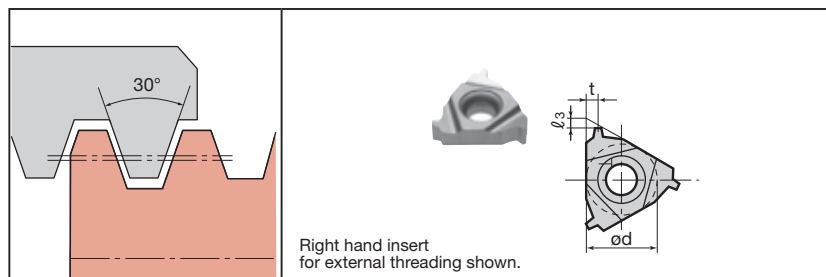
Insert size	External	Internal
16	CER/L□□□□□16□□ B-SER/L□□□□16 B-CER/L□□□□16 BC-SER/L□□□□16	TSNR/L□□□□□16 SNR/L□□□□□16□□ TCNR/L□□□□□16□□ CNR/L□□□□□16□□

Full-profile inserts

Insert size	Pitch (Reference)	Number of threads	Hand of cut	External insert						Internal insert					
				Cat. No.	Grades	Dimensions (mm)				Cat. No.	Grades	Dimensions (mm)			
					Coated	ød	t	ℓ ₃	r _ε		Coated	ød	t	ℓ ₃	r _ε
					AH725						AH725				
16	(0.941)	27	R	16ER27NPTF	●	9.525	0.5	1.2	-						
	(1.411)	18	R	16ER18NPTF	●		0.9	0.7	-						
	(1.814)	14	R	16ER14NPTF	●		1.6	1.2	-	16IR14NPTF	●	9.525	1.6	1.2	-
	(2.209)	11.5	R	16ER115NPTF	●					16IR115NPTF	●				
	(3.175)	8	R	16ER8NPTF	●					16IR8NPTF	●				

◆● : Stocked items. / Packing Quantity = 5 pcs.

30° Trapezoidal (DIN103)

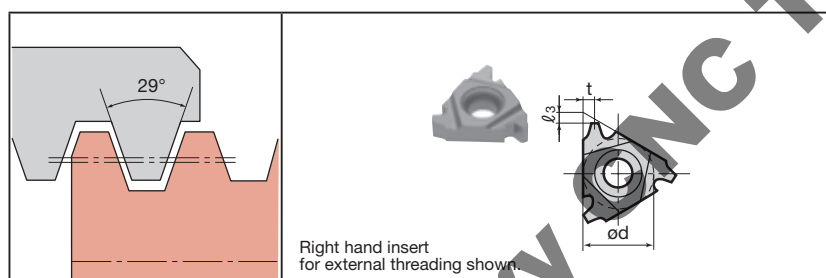


Applicable toolholders

Insert size	External	Internal
16	CER/L□□□□□16□□ B-SER/L□□□□16 B-CER/L□□□□16 BC-SER/L□□□□16	TSNR/L□□□□□16 SNR/L□□□□□16□□ TCNR/L□□□□□16□□ CNR/L□□□□□16□□
22	CER/L□□□□□22□□	TSNR/L□□□□□22 SNR/L□□□□□22□□ TCNR/L□□□□□22□□ CNR/L□□□□□22□□
27	CER/L□□□□□27□	CNR/L□□□□□27□

Insert size	Pitch	Number of threads	Hand of cut	External insert							Internal insert						
				Cat. No.	Grades		Dimensions (mm)				Cat. No.	Grades		Dimensions (mm)			
					Coated		ød	t	ℓ 3	r _E		Coated		ød	t	ℓ 3	r _E
					AH725	T313V						AH725	T313V				
16	1.5		R	16ER15TR	●		9.525	0.9	0.7	-	16IR15TR	●		9.525	0.9	0.7	-
	2		R	16ER20TR	●	●		1.6	1.3		16IR20TR	●	●		1.6	1.3	
	3		R	16ER30TR	●	●					16IR30TR	●	●				
22	4		R	22ER40TR	●	●	12.7	2.5	2	-	22IR40TR	●	●	12.7	2.5	2	-
	5		R	22ER50TR	●	●					22IR50TR	●	●				
27	6		R	27ER60TR	●	●	15.875	3.2	2.5	-							

29° Trapezoidal (ACME)

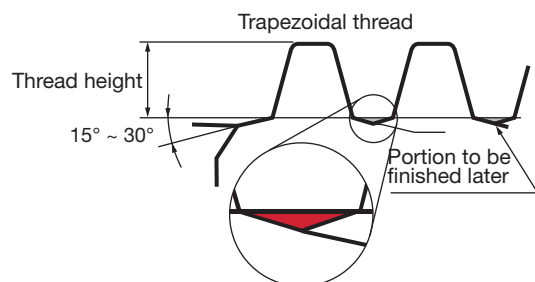


Applicable toolholders

Insert size	External	Internal
16	CER/L□□□□□16□□ B-SER/L□□□□16 B-CER/L□□□□16 BC-SER/L□□□□16	TSNR/L□□□□□16 SNR/L□□□□□16□□ TCNR/L□□□□□16□□ CNR/L□□□□□16□□
22	CER/L□□□□□22□□	TSNR/L□□□□□22 SNR/L□□□□□22□□ TCNR/L□□□□□22□□ CNR/L□□□□□22□□

Insert size	Pitch (Reference)	Number of threads	Hand of cut	External insert							Internal insert						
				Cat. No.	Grades		Dimensions (mm)				Cat. No.	Grades		Dimensions (mm)			
					Coated		ød	t	ℓ ₃	r _E		Coated		ød	t	ℓ ₃	r _E
					AH725	T313V						AH725	T313V				
16	(2.117)	12	R	16ER12ACME	●		9.525	1.6	1.3	-	16IR12ACME	●		9.525	1.6	1.3	-
	(2.540)	10	R	16ER10ACME	●						16IR10ACME	●					
	(3.175)	8	R	16ER8ACME	●	●					16IR8ACME	●	●				
22	(4.233)	6	R	22ER6ACME	●	●	12.7	2.5	2	-	22IR6ACME	●	●	12.7	2.5	2	-
	(5.080)	5	R	22ER5ACME	●	●					22IR5ACME	●	●				

● When machining trapezoidal threads:

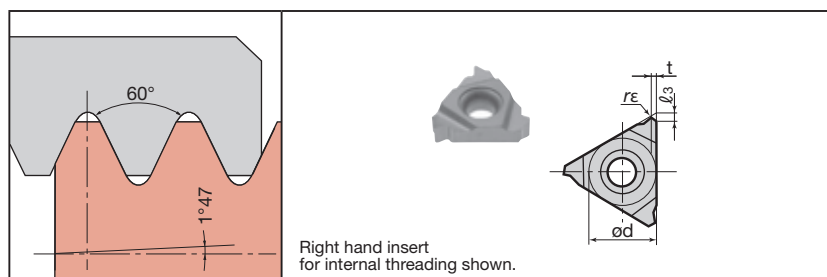


In trapezoidal threads, since slants of 15° to 30° are left on the crest of the thread as shown in Figure below, these portions must be finished later.

Burrless threads can be produced with the full-profile insert.

◆● : Stocked items. / Packing Quantity = 5 pcs.

Round (API 5B)



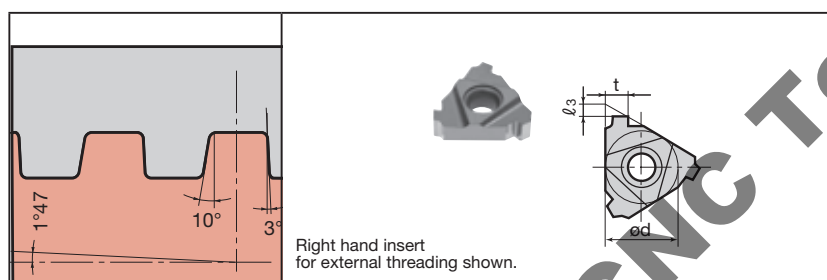
Applicable toolholders

Insert size	External	Internal
16	CER/L□□□□□16□□ B-SER/L□□□□16 B-CER/L□□□□16 BC-SER/L□□□□16	TSNR/L□□□□□16□□ SNR/L□□□□□16□□ TCNR/L□□□□□16□□ CNR/L□□□□□16□□

Full-profile inserts

Insert size	Pitch (Reference)	Number of threads	Hand of cut	External insert							Internal insert						
				Cat. No.	Grades		Dimensions (mm)				Cat. No.	Grades		Dimensions (mm)			
					Coated		ød	t	ℓ ₃	r _E		Coated		ød	t	ℓ ₃	r _E
					AH725	T313V						AH725	T313V				
16	(2.54)	10	R	16ER10API	●		9.525	1.6	1.2	0.36	16IR10API	●	●	9.525	1.6	1.2	0.36
	(3.175)	8	R	16ER8API	●						16IR8API	●	●				

Buttress (API 5B)



Applicable toolholders

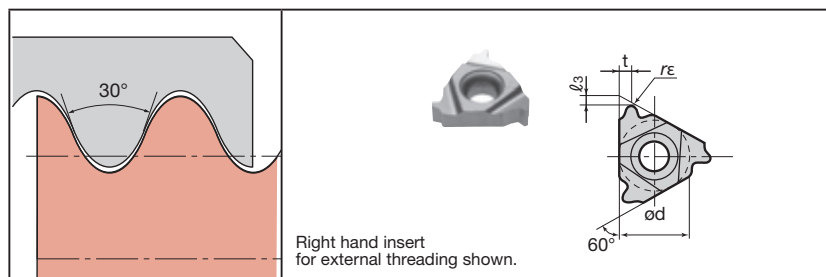
Insert size	External	Internal
22	CER/L□□□□□22□□	TSNR/L□□□□□22□□ SNR/L□□□□□22□□ TCNR/L□□□□□22□□ CNR/L□□□□□22□□

Full-profile inserts

Insert size	Pitch (Reference)	Number of threads	Hand of cut	External insert							Internal insert						
				Cat. No.	Grades		Dimensions (mm)				Cat. No.	Grades		Dimensions (mm)			
					Coated	ød	t	ℓ ₃	r _E	Coated		ød	t	ℓ ₃	r _E		
					AH725					AH725							
22	(2.54)	10	R	22ER5BAPI	●	12.7	3.72	2.2	-	22IR5BAPI	●	12.7	3.45	2.2	-		

◆● : Stocked items. / Packing Quantity = 5 pcs.

Round (DIN405)



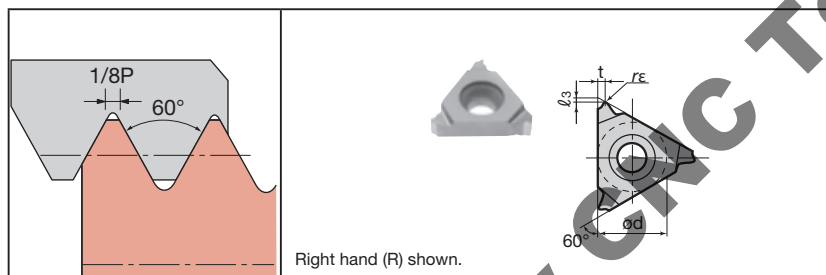
Applicable toolholders

Insert size	External	Internal
16	CER/L□□□□□16□□ B-SER/L□□□□16 B-CER/L□□□□16 BC-SER/L□□□□16	TSNR/L□□□□□16 SNR/L□□□□□16□□ TCNR/L□□□□□16□□ CNR/L□□□□□16□□
22	CER/L□□□□□22□□	TSNR/L□□□□□22 SNR/L□□□□□22□□ TCNR/L□□□□□22□□ CNR/L□□□□□22□□

Full-profile inserts

Insert size	Pitch	Number of threads	Hand of cut	External insert					Internal insert						
				Cat. No.	Grades	Dimensions (mm)				Cat. No.	Grades	Dimensions (mm)			
					Coated	ød	t	ℓ ₃	r _E		Coated	ød	t	ℓ ₃	r _E
					AH725						AH725				
16		10	R	16ER10RD		9.525	1.6	1.5	0.60	16IR10RD		9.525	1.6	1.5	0.55
		8	R	16ER8RD					0.75	16IR8RD					0.68
22		6	R	22ER6RD		12.7	2.5	2.0	1.00	22IR6RD		12.7	2.5	2.0	0.91
		4	R	22ER4RD					1.50	22IR4RD					1.36

Aerospace



Applicable toolholders

Insert size	External
16	CER/L□□□□□16□□ B-SER/L□□□□16 B-CER/L□□□□16 BC-SER/L□□□□16

Full-profile inserts

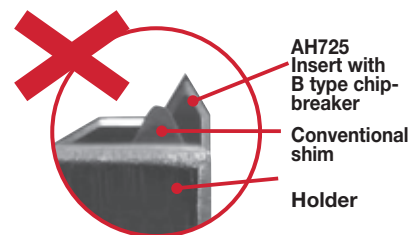
Insert size	Pitch	Number of threads	Hand of cut	External insert					
				Cat. No.	Grades	Dimensions (mm)			
					Coated AH725	ød	t	ℓ ₃	r _E
16		32	R	16ER32UNJ	●	9.525	0.5	1.2	0.13
		28	R	16ER28UNJ	●				0.15
		24	R	16ER24UNJ	●				0.18
		20	R	16ER20UNJ	●				0.21
		18	R	16ER18UNJ	●		0.9	0.7	0.24
		16	R	16ER16UNJ	●				0.26
		14	R	16ER14UNJ	●				0.3
		12	R	16ER12UNJ	●		1.6	1.2	0.35
		10	R	16ER10UNJ	●				0.42
		8	R	16ER8UNJ	●				0.53

◆● : Stocked items. / Packing Quantity = 5 pcs.

IMPORTANT NOTICE

Replacement of shim sheet

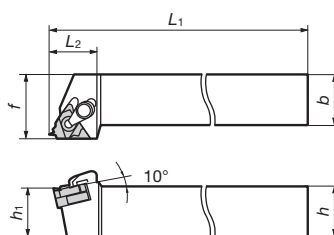
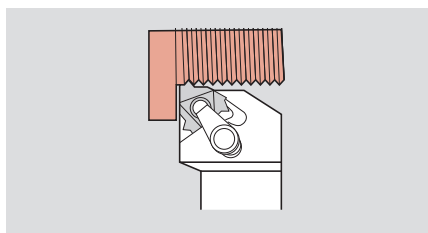
If the conventional shim is still used, please exchange to standard (New) shim according to the following list.



Inappropriate Examples

List of interchangeable shims (Size 16 · Insert).

Holder type	Lead Angle	External Cat. No.		Internal Cat. No.	
		① Conventional	① Standard (New)	② Conventional	② Standard (New)
Dual clamping methods of screw-on and clamp-on	4°	GXE16-4DT	AE16-4DT	GXN16-4DT	AN16-4DT
	3°	GXE16-3DT	AE16-3DT	GXN16-3DT	AN16-3DT
	2°	GXE16-2DT	AE16-2DT	GXN16-2DT	AN16-2DT
	1° (Standard)	GXE16-1DT	A16-1DT	GXN16-1DT	A16-1DT
	0°	GXE16-0DT	AE16-0DT	GXN16-0DT	AN16-0DT
	-1°	GXE16-99DT	AE16-99DT	GXN16-99DT	AN16-99DT
	-2°	GXE16-98DT	AE16-98DT	GXN16-98DT	AN16-98DT
Clamp-on	4°	GXE16-4	AE16-4	GXN16-4	AN16-4
	3°	GXE16-3	AE16-3	GXN16-3	AN16-3
	2°	GXE16-2	AE16-2	GXN16-2	AN16-2
	1° (Standard)	GXE16-1	A16-1	GXN16-1	A16-1
	0°	GXE16-0	AE16-0	GXN16-0	AN16-0
	-1°	GXE16-99	AE16-99	GXN16-99	AN16-99
	-2°	GXE16-98	AE16-98	GXN16-98	AN16-98



Pitch	No. of threads	No. of corners
0.5 ~ 6.0 mm	32 ~ 4	3

Right hand (R), carbide shank type shown.

Steel shank (Dual methods of screw-on and clamp-on clamping)

Cat. No.	Stock		Dimensions (mm)						Insert	Parts				
	R	L	h	b	L ₁	L ₂	h ₁	f		Clamp set	Shim	Shim screw	Clamping screw	Wrench
CER/L1212H16DT	●	●	12	12	100	24	12	16	16ER/L□□□□	CSP16	A16-1DT	DTS5-3.5	CSTB-3.5ST	T-15F P-3.5
CER/L1616H16DT	●	●	16	16	100	24	16	20						
CER/L2020K16DT	●	●	20	20	125	24	20	25						
CER/L2525M16DT	●	●	25	25	150	28	25	32						
CER/L2525M22DT	●	●	25	25	150	31.3	25	32	22ER/L□□□□	CSP22	GX22-1DT	DTS6-4	CSTB-4ST	T-15F T-20F P-4

Steel shank (Clamp-on type)

Note: New shim is used for both right and left hand toolholders.

Cat. No.	Stock		Dimensions (mm)						Insert	Parts				
	R	L	h	b	L ₁	L ₂	h ₁	f		Clamp set	Shim set R	Shim set L	Clamping screw	Wrench
CER/L1212H16T			12	12	100	22	12	16	16ER/L□□□□	CSP16	A16-1	A16-1	-	T-15F
CER/L1616H16T			16	16	100	22	16	20						
CER/L2020K16T			20	20	125	22	20	25						
CER/L2525M16T			25	25	150	25	25	32						
CER/L3232P16T	●		32	32	170	32	32	40	22ER/L□□□□	CSP22	NXE22-1	NXN22-1	-	T-20F
CER/L2525M22T			25	25	150	28	25	32						
CER/L3232P22T	●		32	32	170	32	32	40						
CER/L4040R22T			40	40	200	36	40	50						
CER/L2525M27T	●		25	25	150	34	25	32	27ER/L□□□□	CSP27	NXE27-1	NXN27-1	-	P-4
CER/L3232P27T	●		32	32	170	34	32	40						
CER/L4040R27T			40	40	200	40	40	50						

Note:

A clamp set for CER/L type consists of a clamp and a clamping screw.

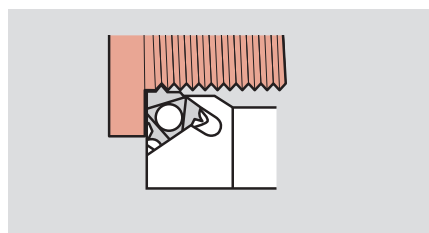
A shim set for CER/L type consists of a shim and a shim screw.

Standard shims for CER/L type can be used for both left hand and right hand toolholders. Use either of the sides depending on the hand.

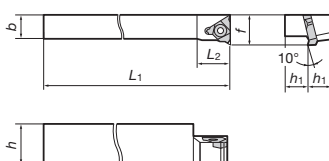
● : Stocked items.

B-S/C E R/L

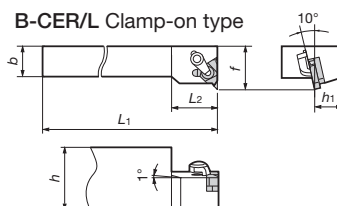
External threading
Dual methods of screw-on and clamp-on clamping



B-SER/L Screw-on type



B-CER/L Clamp-on type



Pitch	No. of threads	No. of corners
0.5 ~ 6.0 mm	32 ~ 4	3

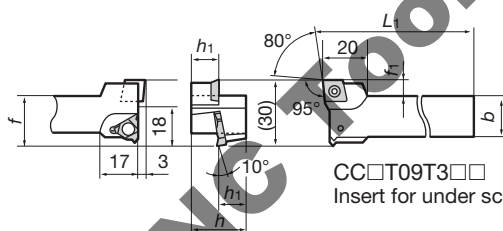
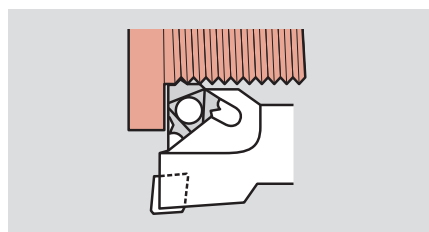
Steel shank

Cat. No.	Stock		Dimensions (mm)						Insert	Parts				
	R	L	h	b	L1	L2	h1	f		Clamp set	Shim set R	Shim set L	Clamping screw	Wrench
B-SER/L10H16	●		20	10	100	15	10	16	16ER/L□□□□					
B-SER/L12K16	●		24	12	125	18	12	18		-	-	-	CSTB-3.5	T-15F
B-CER/L16M16	●	●	32	16	150	24	16	22		CSP16	A16-1	A16-1	-	T-15F

Right hand (R) shown.

BC-SE R/L

External threading
Screw-on



CC□T09T3□□
Insert for under screw

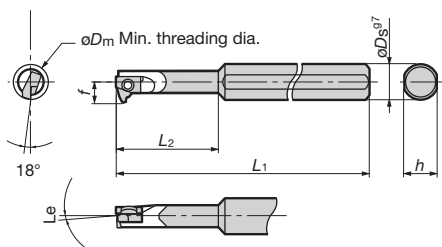
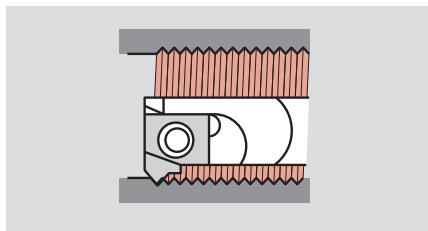
Pitch	No. of threads	No. of corners
0.5 ~ 6.0 mm	32 ~ 4	3

Right hand (R), carbide shank type shown.

Steel shank

Cat. No.	Stock		Dimensions (mm)							Insert	Parts	
	R	L	h	b	L1	L2	h1	f	f1		Clamping screw	Wrench
BC-SER/L12K16	●		24	16	125	-	12	23	7	16ER/L□□□□	CSTB-3.5	T-15F
BC-SER/L16M16			32	20	150	-	16	25	5	CC□T09T3□□		



● : Stocked items.





Pitch	No. of threads	No. of corners
0.5 ~ 2.0 mm	48 ~ 16	1

Right hand (R), carbide shank type shown.

Steel shank

Cat. No.	Stock		Dimensions (mm)						Insert	Parts		
	R	L	Min. threading dia. $\varnothing D_m$	$\varnothing D_s$	f	L_1	L_2	h		Lead Angle Le	Clamping screw	Wrench
												
SNR/L0006H06-2	●		8	8	4.7	100	18	7	6IR/L□□□□	CSTB-2L040	T-6F	
SNR/L0006H06-3	●											
SNR/L0008H06-2	●		10	8	5.7	100	-	7		CSTB-2L	T-6F	
SNR/L0008H06-3	●											

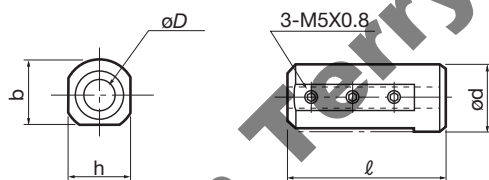
Carbide shank

Cat. No.	Stock		Dimensions (mm)						Insert	Parts		
	R	L	Min. threading dia. $\varnothing D_m$	$\varnothing D_s$	f	L_1	L_2	h		Lead Angle Le	Clamping screw	Wrench
												
SNR/L0006K06SC-2	●		8	8	4.7	125	30	7	2°	6IR/□□□□	CSTB-2L040	T-6F
SNR/L0006K06SC-3	●											
SNR/L0008K06SC-2	●		10	8	5.7	125	-	7	2°		CSTB-2L	T-6F
SNR/L0008K06SC-3	●											

Note: When using a right or left hand insert, the right hand insert (6IR ** type), is used for the right hand toolholders (SNR ** type).

Sleeves

BLM type (Round shank)

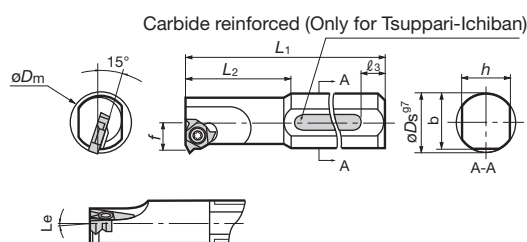
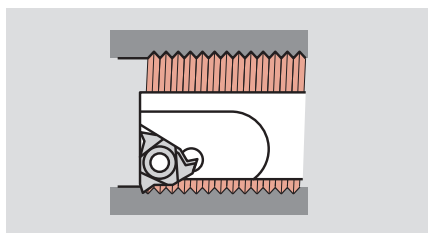


Above drawing shows BLM25-□□C type.

Note: When setting the toolholder on a tool post, direct clamping on the shank with bolts should be avoided. Placing the sleeve between the toolholder and tool post is recommended for stable operation.

Cat. No.	Stock	Applicable shank dia. ϕD	Dimensions (mm)			
			ϕd	ℓ	h	b
BLM19-08	●	8	19.05	100	18	18
BLM20-08	●		20		19	
BLM22-08	●		22	125	21	21
BLM254-08	●		25.4		24	24
BLM25-08C	●		25	55		23

● : Stocked items.



Pitch	No. of threads	No. of corners
0.5 ~ 6.0 mm	48 ~ 5	3

Right hand (R),
Tsuppari-Ichiban type shown.

“Tsuppari-Ichiban” shank

Cat. No.	Stock		Dimensions (mm)								Lead Angle Le	Insert	Parts	
	R	L	Min. threading dia. ϕD_m	ϕD_s	f	L_1	L_2	L_3	h	b			Clamping screw	Wrench
TSNR/L0016Q16	●		19	16	10.6	180	40	59	15	-	1°	16IR/L□□□□	CSTB-3.5	T-15F
TSNR/L0020R22	●		24	20	13.9	200	50	49	18	-	1°	22IR/L□□□□	CSTB-4	T-15F

Steel shank

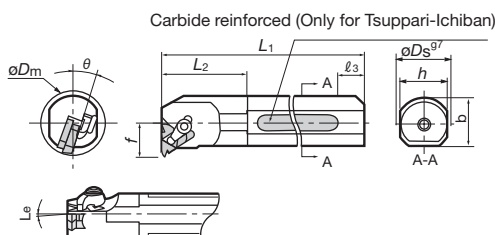
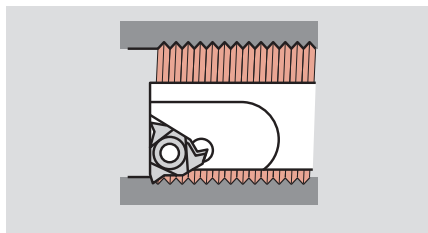
Cat. No.	Stock		Dimensions (mm)								Lead Angle Le	Insert	Parts	
	R	L	Min. threading dia. ϕD_m	ϕD_s	f	L_1	L_2	L_3	h	b			Clamping screw	Wrench
SNR/L0010K11	●	●	12	16	6.6	125	25	-	15	15.5	1°	11IR/L□□□□	CSTB-2.5	T-8F
SNR/L0010K11-2	●										2°			
SNR/L0010K11-3	●										3°			
SNR/L0013L11	●	●	15	16	8.2	140	32.5	-	15	15.5	1°	16IR/L□□□□	CSTB-3.5	T-15F
SNR/L0013L11-2	●										2°			
SNR/L0013L11-3	●										3°			
SNR/L0016M16	●	●	19	16	10.6	150	40	-	15	15.5	1°	22IR/L□□□□	CSTB-4	T-15F
SNR/L0016M16-2	●										2°			
SNR/L0016M16-3	●										3°			
SNR/L0020Q22	●	●	24	20	13.9	180	50	-	18	19	1°			
SNR/L0020Q22-2	●										2°			
SNR/L0020Q22-3	●										3°			

Carbide shank

Cat. No.	Stock		Dimensions (mm)								Lead Angle Le	Insert	Parts	
	R	L	Min. threading dia. ϕD_m	ϕD_s	f	L_1	L_2	L_3	h	b			Clamping screw	Wrench
SNR/L0010M11SC	●		13	10	7.4	150	24	-	9	-	1°	11IR/L□□□□	CSTB-2.5	T-8F
SNR/L0010M11SC-2	●										2°			
SNR/L0010M11SC-3	●										3°			
SNR/L0012P11SC	●		15	12	8.5	170	28	-	11	-	1°	16IR/L□□□□	CSTB-3.5	T-15F
SNR/L0012P11SC-2	●										2°			
SNR/L0012P11SC-3	●										3°			
SNR/L0016R16SC	●	●	20	16	11.9	200	35	-	15	-	1°			
SNR/L0016R16SC-2	●										2°			
SNR/L0016R16SC-3	●										3°			

When using a right or left hand insert, the right hand insert (□□IR**type) is used for the right hand toolholders (SNR**type) and left hand insert (□□IL**type) is used for the left hand toolholders (SNL**type).

● : Stocked items.



Pitch	No. of threads	No. of corners
0.5 ~ 6.0 mm	48 ~ 5	3

Right hand (R),
Tsuppari-Ichiban type shown.

■ “Tsuppari-Ichiban” shank (Dual methods of screw-on and clamp-on clamping)

Cat. No.	Stock		Dimensions (mm)										Insert	Parts				
	R	L	Min. threading dia. ϕD_m	ϕD_s	f	L_1	L_2	ℓ_3	h	b	θ	Lead Angle Le		Clamp set	Shim	Shim screw	Clamping screw	Wrench
TCNR/L0020R16DT	●		24	20	14	200	30	49	18		15°	1°	16IR/L□□□□	CSP16	A16-1DT	DTS5-3.5	CSTB-3.5ST	T-15F P-3.5
TCNR/L0025S16DT	●		29	25	16.5	250	38	64	23	-	15°	1°	16IR/L□□□□	CSP16	A16-1DT	DTS5-3.5	CSTB-3.5ST	T-15F P-3.5
TCNR/L0032T16DT			37	32	20.1	300	48	53	30		15°	1°	22IR/L□□□□	CSP22	GX22-1DT	DTS6-4	CSTB-4ST	T-15F T-20F P-4
TCNR/L0025S22DT	●		30	25	18.2	250	38	64	23	-	15°	1°	22IR/L□□□□	CSP22	GX22-1DT	DTS6-4	CSTB-4ST	T-15F T-20F P-4
TCNR/L0032T22DT			38	32	21.9	300	48	53	30		15°	1°	22IR/L□□□□	CSP22	GX22-1DT	DTS6-4	CSTB-4ST	T-15F T-20F P-4

Note: Shim is used for both right and left hand toolholders.

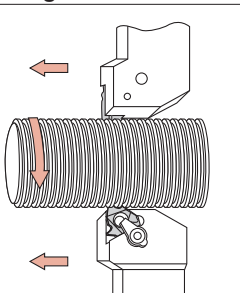
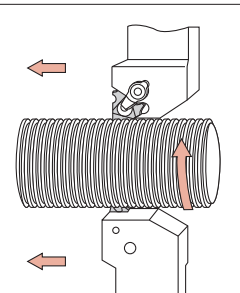
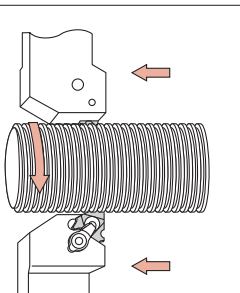
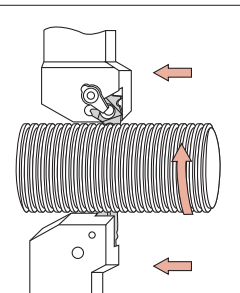
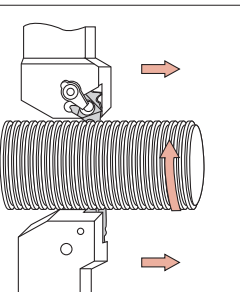
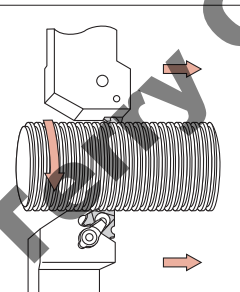
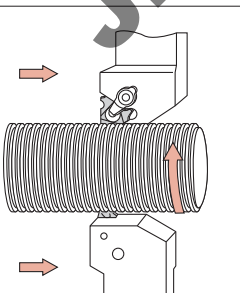
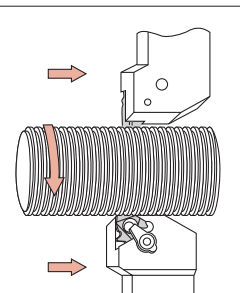
■ Steel shank (Clamp-on type)

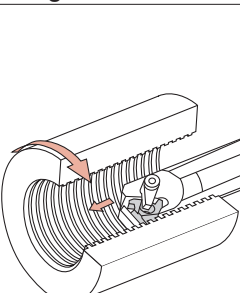
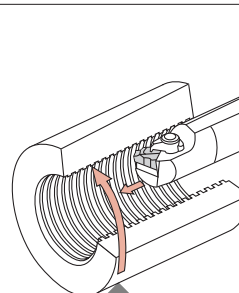
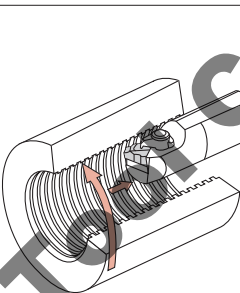
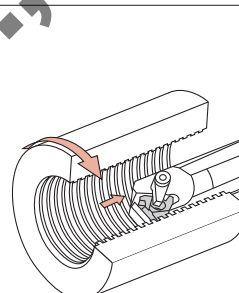
Cat. No.	Stock		Dimensions (mm)										Insert	Parts				
	R	L	Min. threading dia. ϕD_m	ϕD_s	f	L_1	L_2	ℓ_3	h	b	θ	Lead Angle Le		Clamp set	Shim set R	Shim set L	Clamping screw	Wrench
CNR/L0020P16	●	●	24	20	14	170	30		18	19			16IR/L□□□□	CSP16	A16-1	A16-1	-	T-15F
CNR/L0025R16	●	●	29	25	16.5	200	38		23	24			16IR/L□□□□	CSP16	A16-1	A16-1	-	T-15F
CNR/L0032S16	●	●	37	32	20.1	250	48	-	30	31	15°	1°	16IR/L□□□□	CSP16	A16-1	A16-1	-	T-15F
CNR/L0040T16			45	40	24.1	300	60		37	38.5			16IR/L□□□□	CSP16	A16-1	A16-1	-	T-15F
CNR/L0050U16			55	50	29.4	350	75		47	48.5			16IR/L□□□□	CSP16	A16-1	A16-1	-	T-15F
CNR/L0025R22	●	●	30	25	18.2	200	38		23	24			22IR/L□□□□	CSP22	NXN22-1	NXE22-1	-	T-20F
CNR/L0032S22	●	●	38	32	21.9	250	48	-	30	31	15°	1°	22IR/L□□□□	CSP22	NXN22-1	NXE22-1	-	T-20F
CNR/L0040T22			46	40	26.1	300	60	-	37	38.5	15°	1°	22IR/L□□□□	CSP22	NXN22-1	NXE22-1	-	T-20F
CNR/L0050U22			56	50	31	350	75	-	47	48.5	15°	1°	22IR/L□□□□	CSP22	NXN22-1	NXE22-1	-	T-20F
CNR/L0063V22			69	63	37.5	400	95	-	60	61.5	10°	1°	27IR/L□□□□	CSP27	NXN27-1	NXE27-1	-	P-4
CNR/L0040T27	●		46	40	26.9	300	60	-	37	38.5	10°	1°	27IR/L□□□□	CSP27	NXN27-1	NXE27-1	-	P-4
CNR/L0050U27			56	50	31.9	350	75	-	47	48.5	10°	1°	27IR/L□□□□	CSP27	NXN27-1	NXE27-1	-	P-4
CNR/L0063V27			70	63	38.7	400	95	-	60	61.5	10°	1°	27IR/L□□□□	CSP27	NXN27-1	NXE27-1	-	P-4

Note: • A clamp set for CNR/L type toolholders consists of a clamp and a clamping screw.
 • A shim set for CNR/L type toolholders consists of a shim and a shim fixing screw.
 • Standard shims for CNR/L type toolholders are commonly used for right and left hand toolholders.
 When using a right or left hand insert, the right hand insert (□□IR**type) is used for the right hand toolholder (CNR**type) and left hand insert (□□IL**type) is used for left hand toolholder (CNL**type).

● : Stocked items.

Threading Methods and Combinations

External threading																					
Right hand thread	Left hand thread																				
																					
<table border="1"> <tr><td>Work rotation</td><td>Regular</td></tr> <tr><td>Feed direction</td><td>Toward chuck side</td></tr> <tr><td>Hand of toolholder</td><td>Right</td></tr> <tr><td>Hand of insert</td><td>Right</td></tr> <tr><td>Standard shim</td><td>①</td></tr> </table>	Work rotation	Regular	Feed direction	Toward chuck side	Hand of toolholder	Right	Hand of insert	Right	Standard shim	①	<table border="1"> <tr><td>Work rotation</td><td>Reverse</td></tr> <tr><td>Feed direction</td><td>Toward chuck side</td></tr> <tr><td>Hand of toolholder</td><td>Left</td></tr> <tr><td>Hand of insert</td><td>Left</td></tr> <tr><td>Standard shim</td><td>②</td></tr> </table>	Work rotation	Reverse	Feed direction	Toward chuck side	Hand of toolholder	Left	Hand of insert	Left	Standard shim	②
Work rotation	Regular																				
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Hand of toolholder	Right																				
Hand of insert	Right																				
Standard shim	③																				

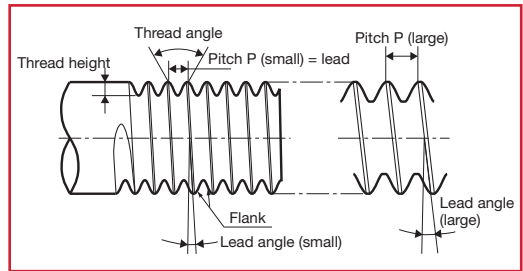
Internal threading																					
Right hand thread	Left hand thread																				
																					
<table border="1"> <tr><td>Work rotation</td><td>Regular</td></tr> <tr><td>Feed direction</td><td>Toward chuck side</td></tr> <tr><td>Hand of toolholder</td><td>Right</td></tr> <tr><td>Hand of insert</td><td>Right</td></tr> <tr><td>Standard shim</td><td>②</td></tr> </table>	Work rotation	Regular	Feed direction	Toward chuck side	Hand of toolholder	Right	Hand of insert	Right	Standard shim	②	<table border="1"> <tr><td>Work rotation</td><td>Reverse</td></tr> <tr><td>Feed direction</td><td>Toward chuck side</td></tr> <tr><td>Hand of toolholder</td><td>Left</td></tr> <tr><td>Hand of insert</td><td>Left</td></tr> <tr><td>Standard shim</td><td>①</td></tr> </table>	Work rotation	Reverse	Feed direction	Toward chuck side	Hand of toolholder	Left	Hand of insert	Left	Standard shim	①
Work rotation	Regular																				
Feed direction	Toward chuck side																				
Hand of toolholder	Right																				
Hand of insert	Right																				
Standard shim	②																				
Work rotation	Reverse																				
Feed direction	Toward chuck side																				
Hand of toolholder	Left																				
Hand of insert	Left																				
Standard shim	①																				
																					
<table border="1"> <tr><td>Work rotation</td><td>Reverse</td></tr> <tr><td>Feed direction</td><td>From chuck side</td></tr> <tr><td>Hand of toolholder</td><td>Left</td></tr> <tr><td>Hand of insert</td><td>Left</td></tr> <tr><td>Standard shim</td><td>③</td></tr> </table>	Work rotation	Reverse	Feed direction	From chuck side	Hand of toolholder	Left	Hand of insert	Left	Standard shim	③	<table border="1"> <tr><td>Work rotation</td><td>Regular</td></tr> <tr><td>Feed direction</td><td>From chuck side</td></tr> <tr><td>Hand of toolholder</td><td>Right</td></tr> <tr><td>Hand of insert</td><td>Right</td></tr> <tr><td>Standard shim</td><td>④</td></tr> </table>	Work rotation	Regular	Feed direction	From chuck side	Hand of toolholder	Right	Hand of insert	Right	Standard shim	④
Work rotation	Reverse																				
Feed direction	From chuck side																				
Hand of toolholder	Left																				
Hand of insert	Left																				
Standard shim	③																				
Work rotation	Regular																				
Feed direction	From chuck side																				
Hand of toolholder	Right																				
Hand of insert	Right																				
Standard shim	④																				

Standard shim			
No.	New	No.	New
①	A16-1DT	②	A16-1DT
	A16-1		A16-1
	GX22-1DT		GX22-1DT
	NXE22-1		NXN22-1
③	NXE27-1	④	NXN27-1
	AE16-99DT		AN16-99DT
	AE16-99		AN16-99
	GXE22-99DT		GXN22-99DT
	NXE22-99		NXN22-99
	NXE27-99		NXN27-99

Fundamentals of screw threads

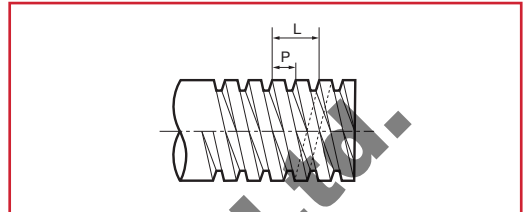
Relationship between lead, lead angle and pitch

1. Lead is the axial distance a screw advances in one rotation. In single start screw, the lead is equal to the pitch.
2. The inclination angle of a threaded groove is called lead angle. In screws of the same diameter, the lead angle increases as the pitch increases.
3. The side face of a completed thread groove is called flank. The distance between the crest and the root is called thread height.



Single and multi start thread

1. The single start thread has a single groove. Two start thread or three start thread has two grooves or three grooves respectively.
2. When viewing the section of the multi start thread, the pitch is same as that of the single start thread. The lead of the two start thread is twice the pitch. The multi start thread is mainly used for trapezoidal threads.



Tolerance class of threads

Tolerance classes of screw threads are expressed as follows:

Metric coarse external thread: 6h, 6g Metric coarse internal thread: 5H, 6H

These classes are ranked with tolerances of thread diameter, pitch, thread angle, etc. For fastening applications, 6H- and 6g-class (former JIS second class) threads, manufactured by

cutting or rolling, are generally used. 5H- and 4h-class threads (former JIS first class) are generally finished by grinding. For example, M8-6g means metric coarse external thread of 6g tolerance class.

TAC threading inserts

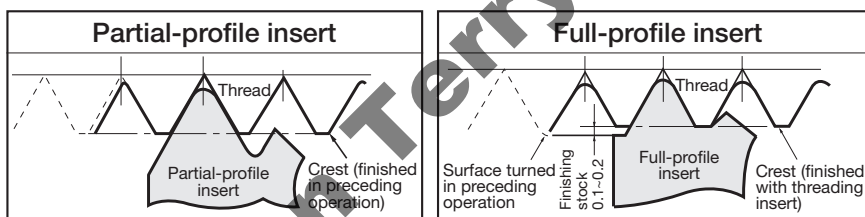
Difference between full-profile and partial-profile insert

Full-profile insert

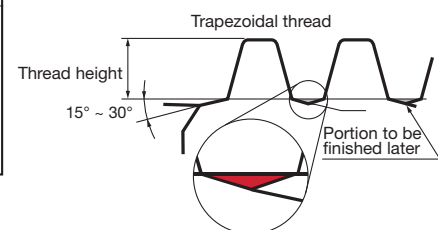
In the full-profile insert, the major diameter of the thread is finished by the profiled finishing edge as shown in Figure below. Therefore, about 0.1 mm of finishing stock must be left on the outer surface of the workpiece before threading. In trapezoidal

threads, since slants of 15° to 30° are left on the crest of the thread as shown in Figure below, these portions must be finished later.

Burrless threads can be produced with the full-profile insert.



When machining trapezoidal threads:



Partial-profile insert

Partial-profile inserts can not be used for finishing of the crest, but can be applied to a wide range of pitches.

For example

Cat. No.	Pitch	No. of threads	r_ϵ
16ERA60	0.5 ~ 1.5	48 ~ 16	0.06
16ERG60	1.75 ~ 3.0	14 ~ 8	0.22

Corner radii of inserts are fitted to the thread of the smallest pitch.

Difference between external and internal use inserts

In full-profile inserts for metric and unified threads, the corner radius and thread height differ from those for the external and internal use insert respectively. Therefore, the right hand insert for external use and the left hand insert for internal use are not the same tool.

Since the rake angles of toolholders are -10° for external toolholders and -15° for internal toolholders, the external / internal toolholders can not be used for machining internal / external thread.

In Whitworth thread, though the external thread and internal

For example

Cat. No.	Applicable inserts	r_ϵ	Thread height
16ER20ISO	External	0.25	1.52
16IL20ISO	Internal	0.14	1.30

thread have the same thread form, the external and internal toolholders are incompatible because of the different rake angle.

Shim replacement method

Compensation for the lead angle and tool relief angle

When the pitch is large or the screw diameter is small, the lead angle becomes large and the effective relief angle on the advance flank side β_2 becomes small. In particular, this will cause shorter life of the insert in the case of trapezoidal screw with small flank angle. It is ideal without any interference for the thread cutting insert to have an equal relief angle on both right and left. Replace the shim so that the rake face of insert faces the thread groove direction (that is, $\beta = \beta_3$).

Calculating the lead angle

The lead angle is calculated as follows:

$$\beta = \tan^{-1}(\ell / \pi d) = \tan^{-1}(nP / \pi d)$$

β : Lead angle
 ℓ : Lead
 n : No. of threads
 P : Pitch
 d : Thread diameter

Calculating the relief angle

The relief angle β_1 is calculated as follows:

$$\beta_1 = \tan^{-1}(\tan \theta \cdot \tan \alpha)$$

The α of a standard toolholder is 10° for external threading and 15° for internal threading.

Included angle 2θ	θ	β_1	
		External threading tool	Internal threading tool
60°	30°	5.8°	8.8°
55°	27.5°	5.2°	7.9°
30°	15°	2.7°	4.1°
29°	14.5°	2.6°	4°

Accordingly, the effective relief angle is calculated as follows:

$$\beta_2 = \beta_1 + \beta_3 - \beta$$

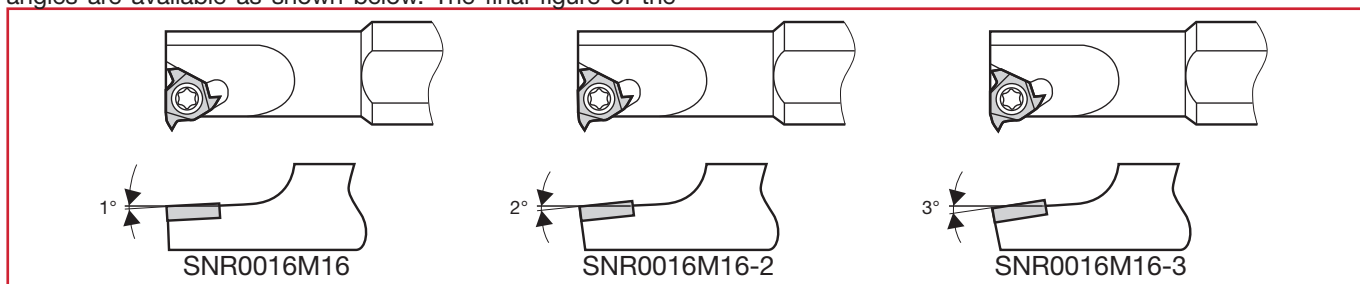
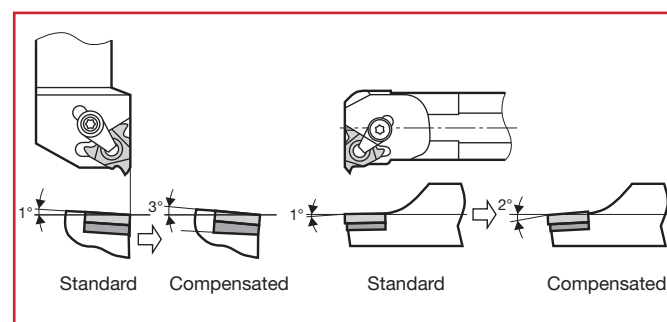
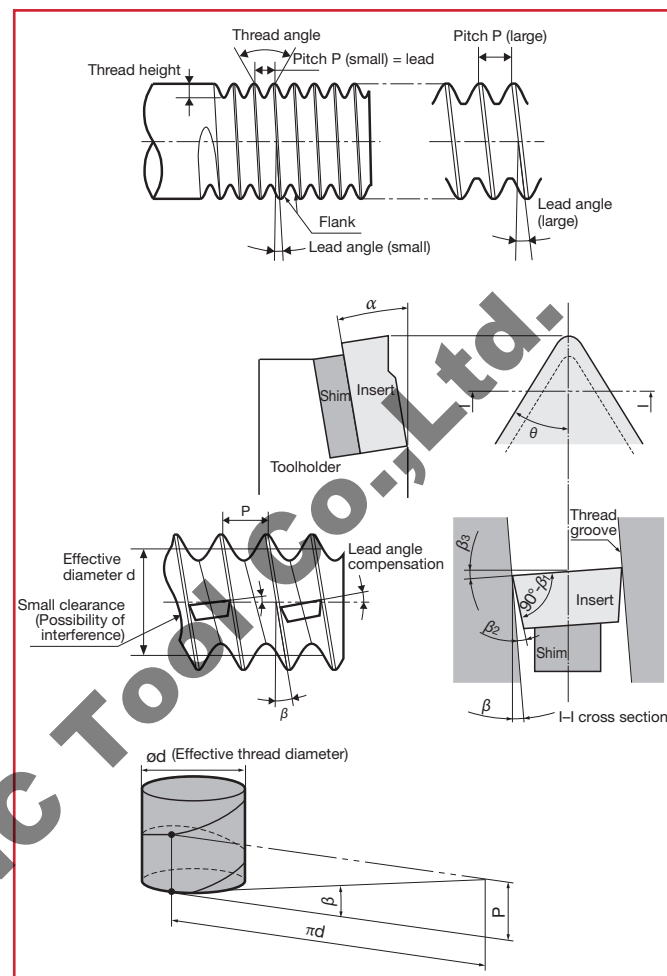
β : Lead angle
 β_2 : Effective relief angle
 β_3 : Lead angle compensation value

In other words, $\beta_1 = \beta_2$ when the thread lead angle is equal to the compensation value. Namely, the relief angle of the tool itself is equal to the effective relief angle. If the wrong compensation value is used, $\beta_1 > \beta_2$. Namely, the effective relief angle becomes smaller. Therefore, carry out compensation of the lead angle so that the following range is obtained:

$\pm 1^\circ$ when the included angle is 60° and 55°
 $\pm 30'$ when the included angle is 30° and 29°

Compensation of lead angle for shim less internal toolholders

When using internal threading toolholders without shim, the above-mentioned method can not be applied for lead angle compensation. Therefore, special toolholders for large lead angles are available as shown below. The final figure of the



Type of shim

The Cat. No. of the shim and compensated lead angles are shown in the table.

Compensated lead angles	-2°	-1°	0°	1°	2°	3°	4°
Shim	□□□-98	□□□-99	□□□-0	□□□-1	□□□-2	□□□-3	□□□-4

Note: The last numeral of the shim Cat. No. is the compensated lead angle.

Toolholders and applicable shims

Screw-on / clamp-on dual toolholders

Toolholder Cat. No.	Shim	
	R	L
CER/L□□□□□16DT	AE16-□DT	AN16-□DT
CER/L□□□□□22DT	GXE22-□DT	GXN22-□DT
TCNR/L□□□□□16DT	AN16-□DT	AE16-□DT
TCNR/L□□□□□22DT	GXN22-□DT	GXE22-□DT

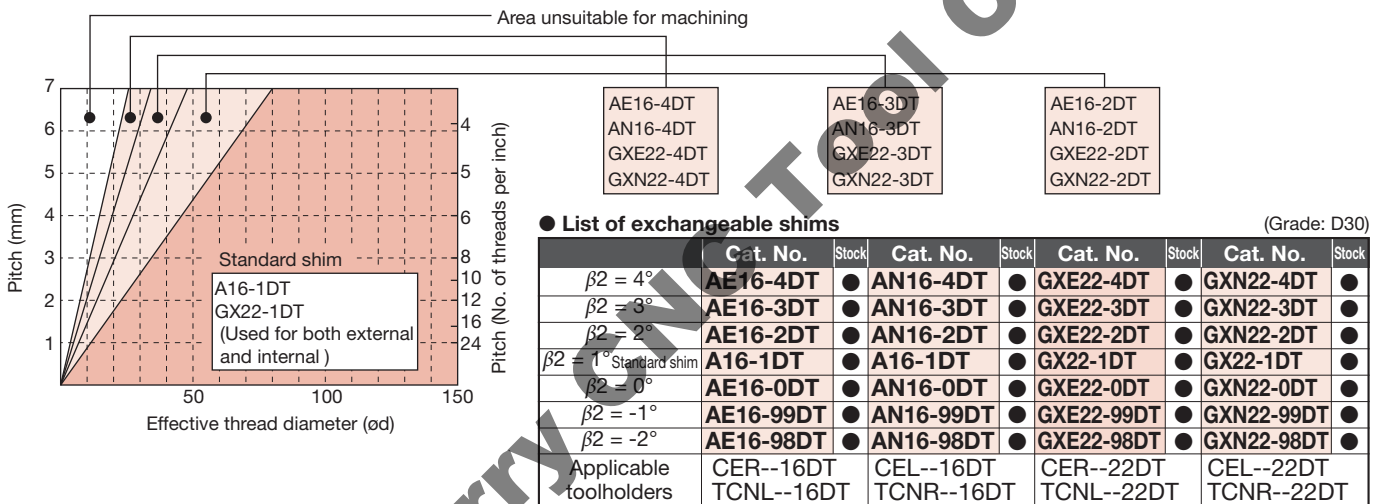
Note: Standard shim is AE16-1DT or GX22-1DT. Other types are optional.

Clamp-on type toolholders

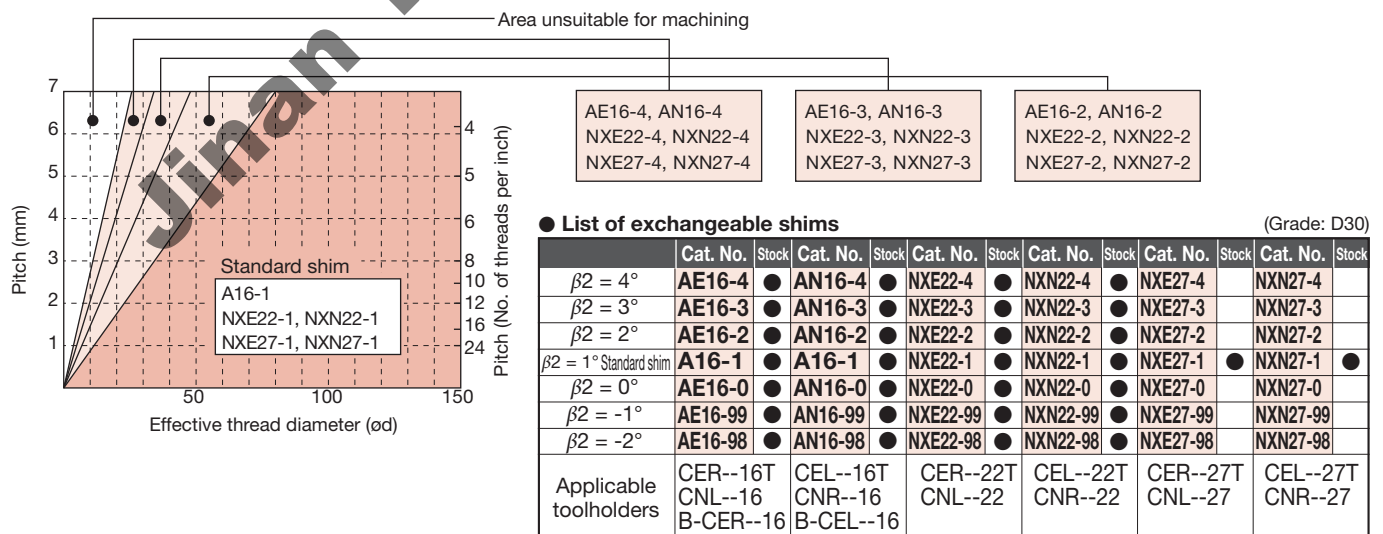
Toolholder Cat. No.	Shim	
	R	L
CER/L□□□□□16-T	AE16-□	AN16-□
CER/L□□□□□22-T	NXE22-□	NXN22-□
CER/L□□□□□27-T	NXE27-□	NXN27-□
CNR/L□□□□□16	AN16-□	AE16-□
CNR/L□□□□□22	NXN22-□	NXE22-□
CNR/L□□□□□27	NXN27-□	NXE27-□
B-CER/L□□□□16	AE16-□	AN16-□

Note: Standard shim is □□□□□-1. Other types are optional.

Shim selection guide for screw-on / clamp-on dual ST-type tools



Shim selection guide for clamp-on type ST-tools



● : Stocked items.

Selection of ST-type Toolholders

Selection of Internal Threading Toolholders

Relation between internal toolholders and machinable threads

In the tables starting from page 7-29, the relationships between toolholders, inserts, threads to be machined, and shims to be replaced are shown. In these tables, the criteria are set as follows.

- The minimum machining diameter.
- The L/D ratio of the toolholder.
- The lead angle of the thread.
- Cutting conditions

Especially when machining near the minimum machining diameter, the compensation for the lead angle should be done carefully.

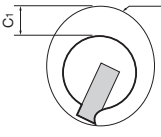
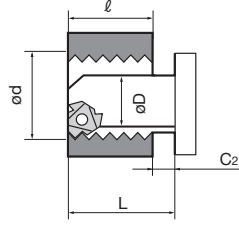
Moreover, in threading, because chips generally can not be broken into small pieces, the shank size should be selected in consideration of adequate clearance (C1).

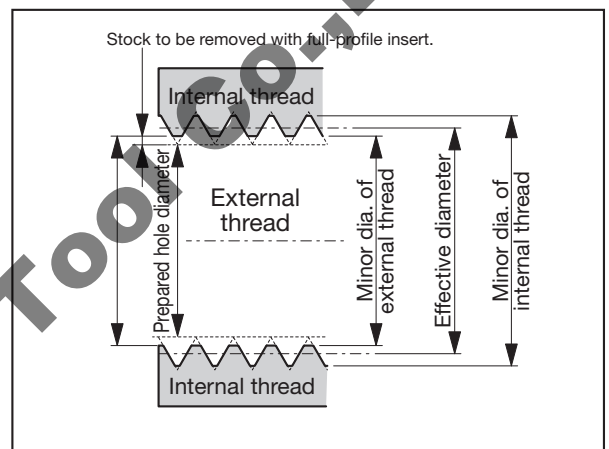
Symbols

- ☐ Recommended
- ☐ Usable
- ☒ Needs replacing of the shim.
"2" indicates "Change to the shim for 2° lead angle".
- ☐ Unusable

7

Threading Tools

Clearance C1		$C_1 \geq 3 \text{ mm}$ (1 mm for SN-Mini types (6IR))
Overhang ratio L/D		<div>Steel shank</div> $L/D \leq 2 \rightarrow \text{○}$ <div>Carbide shank</div> $L/D \leq 3 \rightarrow \text{○}$



How to use the tables

- Firstly, find the nominal thread diameter. Example: M35 X 1.5
- The table indicates that the lead angle is 1°48'.
- The Cat. No. of the insert to be used corresponds with IR15ISO.
- By following the row to the right, ☒ and ☐ marks are found. The ☐ mark indicates the optimum toolholder type. The toolholders of ☒ mark are usable, but less rigid because the shank diameter against the threading diameter is smaller than those of ☐ marked toolholder. In this example, CNR0025R16 and TCNR0020R16DT are the optimum toolholders. The insert Cat.No. is 16IR15ISO.
- In the case of M33 X 3 thread, the lead angle is 1°46'. By following the row to the right, ☒ mark is found. This indicates that the shim should be replaced to 2° type. For calculation of the lead angle, refer to page 7-26.

Metric fine screw thread (ISO)

(For full size of this table, see page 7-30.)

Nominal size	Pitch	Effective diameter	Lead angle	Shank material		Steel shank										Carbide shank						“Tsuppari-Ichiban”																
				Insert size	6IR				11IR				16IR				22IR				6IR		11IR		16IR		16IR		22IR									
					Holder Cat. No.	SNR0006H06-2	SNR0006H06-3	SNR0008H06-2	SNR0008H06-3	SNR0010K11	SNR0010K11-2	SNR0013L11	SNR0013L11-2	SNR0016M16	SNR0016M16-2	CNR0020P16	CNR0025R16	CNR0032S16	CNR0020Q22	SNR0020Q22-2	CNR0025R22	CNR0032S22	SNR0006K06SC-2	SNR0006K06SC-3	SNR0008K06SC-2	SNR0008K06SC-3	SNR0010M11SC	SNR0010M11SC-2	SNR0012P11SC	SNR0012P11SC-2	SNR0016R16SC	SNR0016R16SC-2	TSNR0016Q16	TCNR0020R16DT	TCNR0025S16DT	(TCNR0032T16DT)	TSNR0020R22	TCNR0025S22DT
M33×1.5	1.5	32.03	0°51′	IR15ISO																																		
M33×2	2	31.7	1°09′	IR20ISO	•		•		•		•		•	○							•		•		•		•		•		•		•	○				
M33×3	3	31.05	1°46′	IR30ISO																																		
M35×1.5	1.5	34.03	0°48′	IR15ISO																																		
M36×1.5	1.5	35.03	0°47′	IR15ISO																																		
M36×2	2	34.7	1°03′	IR20ISO																																		
M36×3	3	34.05	1°26′																																			
M38×1.5	1.5	37.03	0°47′																																			

Selection of Internal Toolholders—Relationship between thread sizes, toolholders, and inserts—Part 1

■ Metric coarse screw thread (ISO)

Nominal size	Pitch	Effective diameter	Lead angle	Shank material	Steel shank													Carbide shank								"Tsuyari-ichiban"					
				Insert size	6IR				11IR				16IR		22IR			27IR		6IR				11IR		16IR		22IR			
				Holder Cat. No.	SNR0006H06-2	SNR0006H06-3	SNR0008H06-2	SNR0008H06-3	SNR0010K11-2	SNR0010K11-3	SNR0013L11-2	SNR0013L11-3	SNR0016M16-2	SNR0016M16-3	SNR0020Q22-2	SNR0020Q22-3	CNR0025R22	CNR0032S22	(CNR0040T22)	CNR0040T27	(CNR0050U27)	SNR0006K06SC-2	SNR0006K06SC-3	SNR0008K06SC-2	SNR0008K06SC-3	SNR0010M11SC-2	SNR0010M11SC-3	SNR0016R16SC-2	(SNR0016R16SC-3)	TCNR0025S22DT	(TCNR0032T22DT)
				Insert Cat. No.																											
M10	1.5	9.03	3°02′	IR15ISO																											
M11	1.5	10.03	2°44′	IR15ISO		○															○										
M12	1.75	10.86	2°56′	IR175ISO		○															○										
M14	2	12.7	2°52′	IR20ISO		•		○													•		○								
M16	2	14.7	2°29′	IR20ISO	•		○													•		○									
M18	2.5	16.38	2°47′	IR25ISO																											
M20	2.5	18.38	2°29′	IR25ISO																											
M22	2.5	20.38	2°14′	IR25ISO																											
M24	3	22.05	2°29′	IR30ISO																											
M27	3	25.05	2°11′	IR30ISO									○														○				
M30	3.5	27.73	2°18′	IR35ISO																											
M33	3.5	30.73	2°05′	IR35ISO										○																	
M36	4	33.4	2°11′	IR40ISO										○																	
M39	4	36.4	2°00′	IR40ISO										•		2													2		
M42	4.5	39.08	2°06′	IR45ISO										•		2													2		
M45	4.5	42.08	1°57′	IR45ISO										•		2													2		
M48	5	44.75	2°02′	IR50ISO										•		2	2												2		
M52	5	48.75	1°52′	IR50ISO										•		2	2												2		
M56	5.5	52.43	1°55′	IR55ISO										•		2	2												2		
M60	5.5	56.43	1°47′	IR55ISO																											
M64	6	60.1	1°49′	IR60ISO																											
M68	6	64.1	1°42′	IR60ISO																											

② : Change the shim to NXN22-2

② : Change the shim to NXN27-2

② : Change the shim to GXN22-2DT

■ Metric fine screw thread (ISO)

1/4

Nominal size	Pitch	Effective diameter	Lead angle	Shank material	Steel shank										Carbide shank									
				Insert size	6IR				11IR						6IR				11IR					
				Holder Cat. No.	SNR0006H06-2	SNR0006H06-3	SNR0008H06-2	SNR0008H06-3	SNR0010K11	SNR0010K11-2	SNR0010K11-3	SNR0013L11	SNR0013L11-2	SNR0013L11-3	SNR0006K06SC-2	SNR0006K06SC-3	SNR0008K06SC-2	SNR0008K06SC-3	SNR0010M11SC	SNR0010M11SC-2	SNR0010M11SC-3	SNR0012P11SC	SNR0012P11SC-2	SNR0012P11SC-3
M9×0.75	0.75	8.51	1°36'	IR075ISO																				
M9×1	1	8.32	2°11'	IR10ISO																				
M10×0.75	0.75	9.51	1°26'	IR075ISO																				
M10×1	1	9.35	1°57'	IR10ISO		○									○									
M10×1.25	1.25	9.19	2°29'	IR125ISO																				
M11×0.75	0.75	10.51	1°18'	IR075ISO																				
M11×1	1	10.35	1°46'	IR10ISO		○									○									
M12×1	1	11.35	1°36'	IR10ISO	•		○								•		○							
M12×1.25	1.25	11.19	2°02'	IR125ISO	○										○									
M12×1.5	1.5	11.03	2°29'	IR15ISO	○										○									
M14×1	1	13.35	1°22'	IR10ISO																				
M14×1.25	1.25	13.19	1°44'	IR125ISO	•		○								•		○							
M14×1.5	1.5	13.03	2°06'	IR15ISO	•		○								•		○							
M15×1	1	14.35	1°16'	IR10ISO																				
M15×1.5	1.5	14.03	1°57'	IR15ISO	•		○								•		○							
M16×1	1	15.35	1°11'	IR10ISO					○															
M16×1.5	1.5	15.03	1°49'	IR15ISO	•		○								•		○							
M17×1	1	16.35	1°07'	IR10ISO					○										○					
M17×1.5	1.5	16.03	1°42'	IR15ISO	•		•		○						•		○							
M18×1	1	17.35	1°03'	IR10ISO					○										○					
M18×1.5	1.5	17.03	1°36'	IR15ISO	•		•		○						•		•		○					
M18×2	2	16.7	2°11'	IR20ISO	•		•		○						•		•		○					
M20×1	1	19.35	0°57'	IR10ISO					•			○							•			○		
M20×1.5	1.5	19.03	1°26'	IR15ISO					•			○							•			○		
M20×2	2	18.7	1°57'	IR20ISO	•		•		○						•		•		•			○		

Note : The above tables show correspondence of internal toolholders at the time of setting clearance between thread and toolholder to 3 mm (1 mm in case of SN type) and the finishing stock to 0.1 mm.

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Selection of ST-type Toolholders

■ Metric fine screw thread (ISO)

2/4

Nominal size	Pitch	Effective diameter	Lead angle	Shank material		Steel shank										Carbide shank										"Tsupari-ichiban"										
				Insert size	Holder Cat. No.	6IR		11IR				16IR				6IR		11IR				16IR				16IR										
						Insert Cat. No.	Holder Cat. No.	SNR0006H06-2	SNR0006H06-3	SNR0008H06-2	SNR0008H06-3	SNR0010K11	SNR0010K11-2	SNR0013L11	SNR0013L11-2	SNR0013L11-3	SNR0016M16	SNR0016M16-2	SNR0016M16-3	CNR0020P16	SNR0006K06SC-2	SNR0006K06SC-3	SNR0008K06SC-2	SNR0008K06SC-3	SNR0010M11SC	SNR0010M11SC-2	SNR0010M11SC-3	SNR0012P11SC	SNR0012P11SC-2	SNR0012P11SC-3	SNR0016R16SC	SNR0016R16SC-2	(SNR0016R16SC-3)	TSNR0016Q16	TCNR0020R16DT	TCNR0025S16DT
M22×1	1	21.35	0°51′	IR10ISO						•		○										•			○											
M22×1.5	1.5	21.03	1°18′	IR15ISO	•		•		•		○							•		•		•			○											
M22×2	2	20.7	1°46′	IR20ISO	•		•			•		○						•		•			•			○										
M24×1	1	23.35	0°47′	IR10ISO								○			•								•									•				
M24×1.5	1.5	23.03	1°11′	IR15ISO	•		•					○			•			•		•			•			○						•				
M24×2	2	22.07	1°39′	IR20ISO	•		•			•		○						•		•			•				○									
M25×1	1	24.35	0°45′	IR10ISO						•		○			•											○						•				
M25×1.5	1.5	24.03	1°08′	IR15ISO	•		•					○			•			•		•			•			○						•				
M25×2	2	23.7	1°32′	IR20ISO	•		•			•		○						•		•			•			○										
M26×1.5	1.5	25.03	1°06′	IR15ISO	•		•			•		•			○			•		•			•			•							○			
M27×1	1	26.35	0°42′	IR10ISO						•		•			○								•			•						○				
M27×1.5	1.5	26.03	1°03′	IR15ISO	•		•			•		•			○			•		•			•			•						○				
M27×2	2	25.7	1°25′	IR20ISO	•		•			•		•			○			•		•			•			•						○				
M28×1	1	27.35	0°40′	IR10ISO						•		•			○								•			•						○				
M28×1.5	1.5	27.03	1°01′	IR15ISO	•		•			•		•			○			•		•			•			•						○				
M28×2	2	26.7	1°22′	IR20ISO	•		•			•		•			○			•		•			•			•						○				
M30×1	1	29.35	0°37′	IR10ISO						•		•			○								•			•						○				
M30×1.5	1.5	29.03	0°57′	IR15ISO						•		•			○								•			•						○				
M30×2	2	28.7	1°16′	IR20ISO	•		•			•		•			○			•		•			•			•						○				
M30×3	3	28.05	1°57′	IR30ISO											○																	○				
M32×1.5	1.5	31.03	0°53′	IR15ISO						•		•			○			•		•			•			•						•		○		
M32×2	2	30.07	1°11′	IR20ISO	•		•			•		•			○			•		•			•			•						•		○		

■ Metric fine screw thread (ISO)

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Nominal size	Pitch	Effective diameter	Lead angle	Shank material		Steel shank												Carbide shank									“Tsupari-Ichiban”																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
				Insert size	Holder Cat. No.	6IR		11IR				16IR				22IR		6IR			11IR			16IR	16IR		22IR																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
				Insert Cat. No.		SNR0006H06-2	SNR0006H06-3	SNR0008H06-2	SNR0008H06-3	SNR0010K11-1	SNR0010K11-2	SNR0013L11-1	SNR0013L11-2	SNR0016M16-1	SNR0016M16-2	CNR0020P16	CNR0025R16	CNR0032S16	SNR0020Q22	SNR0020Q22-2	CNR0025R22	CNR0032S22	SNR0006K06SC-2	SNR0006K06SC-3	SNR0008K06SC-2	SNR0008K06SC-3	SNR0010M11SC-2	SNR0010M11SC-3	SNR0012P11SC-2	SNR0012P11SC-3	SNR0016R16SC	SNR0016R16SC-2	TSNR0016Q16	TCNR0020R16DT	TCNR0025S16DT	(TCNR0032T16DT)	TSNR0020R22	TCNR0025S22DT																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
M33×1.5	1.5	32.03	0°51′	IR15ISO											○																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				</

2 : Change the shim to AN16-2

2 : Change the shim to NXN22-2

2 : Change the shim to AN16-2DT

2 : Change the shim to GXN22-2DT

Note : The above tables show correspondence of internal toolholders at the time of setting clearance between thread and toolholder to 3 mm (1 mm in case of SN type) and the finishing stock to 0.1 mm.

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Threading Tools

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2 : Change the shim to NXN22-2

② : Change the shim to NXN27-2

2 : Change the shim to GXN22-2DT

Note : The above tables show correspondence of internal toolholders at the time of setting clearance between thread and toolholder to 3 mm (1 mm in case of SN type) and the finishing stock to 0.1 mm.

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Selection of ST-type Toolholders

Unified fine screw thread (UNF)

Nominal size	TPI	Effective diameter	Lead angle	Shank material	Steel shank								Carbide shank								"Tsuppari-Ichiban"						
				Insert size	6IR				11IR		16IR		6IR				11IR			16IR				16IR			
				Holder Cat. No.	SNR0006H06-2	SNR0006H06-3	SNR0008H06-2	SNR0008H06-3	SNR0010K11-2	SNR0013L11-2	SNR0016M16	SNR0016M16-2	CNR0020P16	CNR0025R16	SNR0006K06SC-2	SNR0006K06SC-3	SNR0008K06SC-2	SNR0008K06SC-3	SNR0010M11SC	SNR0010M11SC-2	SNR0012P11SC	SNR0012P11SC-2	SNR0016R16SC	SNR0016R16SC-2	TSNR0016Q16	TCNR0020R16DT	TCNR0025S16DT
				Insert Cat. No.																							
3/8-24UNF	24	8.84	2°11′	(IR24UN)																							
				IRA60																							
7/16-20UNF	20	10.29	2°15′	(IR20UN)																							
				IRA60	○									○													
1/2-20UNF	20	11.87	1°57′	(IR20UN)																							
				IRA60	•		○							•		○											
9/16-18UNF	18	13.37	1°55′	(IR18UN)																							
				IRA60	•		○							•		○											
5/8-18UNF	18	14.96	1°43′	(IR18UN)																							
				IRA60	•		○							•		○											
3/4-16UNF	16	18.02	1°36′	IR16UN						○									○								
7/8-14UNF	14	21.05	1°34′	IR14UN						•	○								•		○						
1-12UNF	12	24.03	1°36′	IR12UN									○										○				
1 1/8-12UNF	12	27.2	1°25′	IR12UN								○										○		○			
1 1/4-12UNF	12	30.38	1°16′	IR12UN								•		○								○		•	○		
1 3/8-12UNF	12	33.55	1°09′	IR12UN								•		•	○							○		•	•	○	
1 1/2-12UNF	12	36.73	1°03′	IR12UN								•		•	○							○		•	•	○	

Whitworth coarse screw thread (W)

Nominal size	TPI	Pitch	Effective diameter	Lead angle	Shank material		Steel shank								Carbide shank			"Tsuppari-Ichiban"		
					Insert size	16IR		22IR				27IR		16IR			22IR			
						Holder Cat. No.	SNR0016M16-2	SNR0016M16-3	SNR0020Q22-2	SNR0020Q22-3	CNR0025R22	CNR0032S22	(CNR0040T22)	CNR0040T27	(CNR0050U27)	SNR0016R16SC	SNR0016R16SC-2	(SNR0016R16SC-3)	TCNR0025S22DT	(TCNR0032T22DT)
W7/16	14	1.81	9.95	3°19´	(IR14W)															
W1/2	12	2.12	11.35	3°24´	IR12W															
W9/16	12	2.12	12.93	2°59´	IR12W															
W5/8	11	2.31	14.4	2°55´	IR11W															
W3/4	10	2.54	17.42	2°39´	IR10W															
W7/8	9	2.82	20.42	2°31´	(IR9W)															
W1	8	3.18	23.37	2°29´	IR8W	○														
W1 1/8	7	3.63	26.25	2°31´	(IR7W)															
W1 1/4	7	3.63	29.43	2°15´	(IR7W)			○												
W1 3/8	6	4.23	32.21	2°24´	(IR6W)			○												
W1 1/2	6	4.23	35.39	2°11´	(IR6W)			○												
W1 5/8	5	5.08	38.02	2°26´	(IR5W)			•		[2]							[2]			
W1 3/4	5	5.08	41.2	2°15´	(IR5W)			•		[2]							[2]			
W1 7/8	4.5	5.64	44.01	2°20´	(IR45W)															
W2	4.5	5.64	47.19	2°11´	(IR45W)															
W2 1/4	4	6.35	53.08	2°11´	(IR4W)															
W2 1/2	4	6.35	59.43	1°57´	(IR4W)							[2]								

[2] : Change the shim to NXN22-2

[2] : Change the shim to NXN27-2

[2] : Change the shim to GXN22-2DT

Note : The above tables show correspondence of internal toolholders at the time of setting clearance between thread and toolholder to 3 mm (1 mm in case of SN type) and the finishing stock to 0.1 mm.

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Whitworth fine screw thread (W)

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Nominal size	TPI	Pitch	Effective diameter	Lead angle	Shank material		Steel shank										Carbide shank				"Tsuppari-Ichiban"				
					Insert size	6IR				11IR				16IR				11IR		16IR		16IR			
					Holder Cat. No.	SNR0006H06-2	SNR0006H06-3	SNR0008H06-2	SNR0008H06-3	SNR0010K11	SNR0010K11-2	SNR0013L11	SNR0013L11-2	SNR0016M16	SNR0016M16-2	SNR0016M16-3	CNR0020P16	CNR0025R16	SNR0010M11SC-2	SNR0012P11SC-2	SNR0016R16SC	SNR0016R16SC-2	TSNR0016Q16	TCNR0020R16DT	TCNR0025S16DT
					Insert Cat. No.																				
W13	16	1.588	11.98	2°25′	(IR16W)																				
W13.5	16	1.588	12.48	2°19′	(IR16W)																				
W14	16	1.588	12.98	2°14′	(IR16W)																				
W14.5	16	1.588	13.48	2°09′	(IR16W)																				
W15	16	1.588	13.98	2°04′	(IR16W)																				
W16	14	1.814	14.84	2°14′	(IR14W)																				
W17	14	1.814	15.84	2°05′	(IR14W)						○														
W18	14	1.814	16.84	1°58′	(IR14W)						○						○								
W19	12	2.117	17.65	2°11′	IR12W																				
W20	12	2.117	18.65	2°04′	IR12W																				
W21	12	2.117	19.65	1°58′	IR12W																				
W22	12	2.117	20.65	1°52′	IR12W																				
W23	10	2.54	21.37	2°10′	IR10W																				
W24	10	2.54	22.37	2°04′	IR10W																				
W25	10	2.54	23.37	1°59′	IR10W										○										
W26	10	2.54	24.37	1°54′	IR10W										○										
W28	9	2.822	26.19	1°58′	(IR9W)										○										
W30	9	2.822	28.19	1°50′	(IR9W)										○										
W32	9	2.822	30.19	1°42′	(IR9W)										•	<u>2</u>					•			<u>2</u>	
W34	8	3.175	31.97	1°49′	IR8W										•	<u>2</u>					•			<u>2</u>	
W35	8	3.175	32.97	1°45′	IR8W										•	<u>2</u>					•			<u>2</u>	
W36	8	3.175	33.97	1°42′	IR8W											2	<u>2</u>				•			2	<u>2</u>
W38	8	3.175	35.97	1°37′	IR8W										•	2	<u>2</u>				•			2	<u>2</u>
W40	8	3.175	37.97	1°31′	IR8W										•	2	<u>2</u>				•			2	<u>2</u>
W42	8	3.175	39.97	1°27′	IR8W										•	○					○			•	○

② : Change the shim to AN16-2 ② : Change the shim to AN16-2DT

Whitworth fine screw thread (W)

2/2

Nominal size	TPI	Pitch	Effective diameter	Lead angle	Shank material		Steel shank										“Tsuppari-Ichiban”		
					Insert size	Holder Cat. No.	22IR							27IR			22IR		
							SNR0020Q22	SNR0020Q22-2	CNR0025S22	CNR0032S22	(CNR0040T22)	(CNR0050U22)	(CNR0063V22)	CNR0040T27	(CNR0050U27)	(CNR0063V27)	TSNR0020R22	TCNR0025S22DT	(TCNR0032T22DT)
W44	7	3.629	41.68	1°35′	(22IR7W)	•	②									•	②		
W45	7	3.629	42.68	1°33′	(22IR7W)	•	②									•	②		
W46	7	3.629	43.68	1°31′	(22IR7W)	•	②									•	②		
W48	7	3.629	45.68	1°27′	(22IR7W)	•		•	○							•	•	○	
W50	7	3.629	47.68	1°23′	(22IR7W)	•		•	○							•	•	○	
W52	7	3.629	49.68	1°20′	(22IR7W)	•		•	○							•	•	○	
W55	6	4.233	52.29	1°29′	(22IR6W)	•		•	○							•	•	○	
W58	6	4.233	55.29	1°24′	(22IR6W)	•		•	•	○						•	•	○	
W60	6	4.233	57.29	1°21′	(22IR6W)	•		•	•	○						•	•	○	
W62	6	4.233	59.29	1°18′	(22IR6W)	•		•	•	○						•	•	○	
W65	6	4.233	62.29	1°14′	(22IR6W)	•		•	•	○						•	•	○	
W68	6	4.233	65.29	1°11′	(22IR6W)	•		•	•	•	○					•	•	○	
W70	6	4.233	67.29	1°09′	(22IR6W)	•		•	•	•	○					•	•	○	
W72	6	4.233	69.29	1°07′	(22IR6W)	•		•	•	•	○					•	•	○	
W75	5	5.08	71.75	1°17′	(22IR5W)	•		•	•	•	○					•	•	○	
W78	5	5.08	74.75	1°14′	(22IR5W)	•		•	•	•	○					•	•	○	
W80	5	5.08	76.75	1°12′	(22IR5W)	•		•	•	•	○					•	•	○	
W82	5	5.08	78.75	1°11′	(22IR5W)	•		•	•	•	•	○				•	•	○	
W85	5	5.08	81.75	1°08′	(22IR5W)	•		•	•	•	•	○				•	•	○	
W88	5	5.08	84.75	1°06′	(22IR5W)	•		•	•	•	•	○				•	•	○	
W90	5	5.08	86.75	1°04′	(22IR5W)	•		•	•	•	•	○				•	•	○	
W92	5	5.08	88.75	1°03′	(22IR5W)	•		•	•	•	•	○				•	•	○	
W95	5	5.08	91.75	1°01′	(22IR5W)	•		•	•	•	•	○				•	•	○	
W98	5	5.08	94.75	0°59′	(22IR5W)	•		•	•	•	•	○				•	•	○	
W100	5	5.08	96.75	0°57′	(22IR5W)	•		•	•	•	•	○				•	•	○	
W105	5	5.08	101.75	0°55′	(22IR5W)	•		•	•	•	•	○				•	•	○	
W110	4	6.35	105.93	0°52′	(27IR4W)								•	•	○				

② : Change the shim to NXN22-2

② : Change the shim to GXN22-2

Note : The above tables show correspondence of internal toolholders at the time of setting clearance between thread and toolholder to 3 mm (1 mm in case of SN type) and the finishing stock to 0.1 mm.

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Selection of ST-type Toolholders

■ 30° trapezoidal thread (TR)

1/2

Nominal size	Pitch	Effective diameter	Lead angle	Shank material		Steel shank												Carbide shank			“Tsuppari-Ichiban”									
				Insert size	Holder Cat. No.	16IR						22IR				27IR		16IR			16IR			22IR						
						SNR0016M16	SNR0016M16-2	SNR0016M16-3	CNR0020P16	CNR0025R16	CNR0032S16	CNR0040T16	CNR0050U16	SNR0020Q22	SNR0020Q22-2	SNR0020Q22-3	CNR0025R22	CNR0032S22	CNR0040T27	(CNR0050U27)	SNR0016R16SC	SNR0016R16SC-2	(SNR0016R16SC-3)	TSNR0016Q16	TCNR0020R16DT	TCNR0025S16DT	(TCNR0032T16DT)	TSNR0020R22	TCNR0025S22DT	(TCNR0032T22DT)
TR22×3	3	20.5	2°40′	IR30TR																										
TR24×5	5	21.5	4°14′	IR50TR																										
TR24×3	3	22.5	2°26′	IR30TR																										
TR26×5	5	23.5	3°52′	IR50TR																										
TR26×3	3	24.5	2°14′	IR30TR		○																								
TR28×5	5	25.5	3°34′	IR50TR																										
TR28×3	3	26.5	2°04′	IR30TR		•															○									
TR30×6	6	27	4°03′	IR60TR																										
TR30×3	3	28.5	1°55′	IR30TR		•															○									
TR32×6	6	29	3°46′	IR60TR																										
TR32×3	3	30.5	1°48′	IR30TR		•		[2]													•			[2]						
TR34×6	6	31	3°32′	IR60TR																										
TR34×3	3	32.5	1°41′	IR30TR		•		[2]													•			[2]						
TR36×6	6	33	3°19′	IR60TR																										
TR36×3	3	34.5	1°35′	IR30TR		•		2	[2]															[2]	[2]					
TR38×3	3	36.5	1°30′	IR30TR		•		2	[2]															[2]	[2]					
TR40×3	3	38.5	1°25′	IR30TR	•			•	○												○			•	○					
TR42×3	3	40.5	1°21′	IR30TR	•			•	○												○			•	○					
TR44×3	3	42.5	1°17′	IR30TR	•			•	•	○											○			•	•	○				
TR46×3	3	44.5	1°14′	IR30TR	•			•	•	○											○			•	•	○				
TR48×3	3	46.5	1°11′	IR30TR	•			•	•	○											○			•	•	○				
TR50×3	3	48.5	1°08′	IR30TR	•			•	•	○											○			•	•	○				
TR52×3	3	50.5	1°05′	IR30TR	•			•	•	•	○										○			•	•	○				
TR55×3	3	53.5	1°01′	IR30TR	•			•	•	•	○										○			•	•	○				
TR60×3	3	58.5	0°56′	IR30TR	•			•	•	•	○										○			•	•	○				

[2] : Change the shim to AN16-2

[2] : Change the shim to AN16-2DT

■ 30° trapezoidal thread (TR)

2/2

Nominal size	Pitch	Effective diameter	Lead angle	Shank material		Steel shank												Carbide shank			“Tsuppari-Ichiban”														
				Insert size	Holder Cat. No.	16IR						22IR						27IR			16IR			16IR			22IR								
						Insert Cat. No.	SNR0016M16	SNR0016M16-2	SNR0016M16-3	CNR0020P16	CNR0025R16	CNR0032S16	SNR0020Q22	SNR0020Q22-2	SNR0020Q22-3	CNR0025R22	CNR0032S22	(CNR0040T22)	(CNR0050U22)	(CNR0063V22)	CNR0040T27	(CNR0050U27)	(CNR0063V27)	SNR0016R16SC	SNR0016R16SC-2	(SNR0016R16SC-3)	TSNR0016Q16	TCNR0020R16DT	TCNR0025S16DT	(TCNR0032T16DT)	TSNR0020R22	TCNR0025S22DT	(TCNR0032T22DT)		
TR65×4	4	63	1°09′	IR40TR										•				•	•	•	○											•	•	○	
TR70×4	4	68	1°04′	IR40TR											•				•	•	•	○											•	•	○
TR75×4	4	73	1°00′	IR40TR											•				•	•	•	○											•	•	○
TR80×4	4	78	0°56′	IR40TR											•				•	•	•	•	○										•	•	○
TR85×4	4	83	0°53′	IR40TR											•				•	•	•	•	○										•	•	○
TR90×4	4	88	0°50′	IR40TR											•				•	•	•	•	○										•	•	○
TR95×4	4	93	0°47′	IR40TR											•				•	•	•	•	○										•	•	○
TR100×4	4	98	0°45′	IR40TR											•				•	•	•	•	○										•	•	○
TR105×4	4	103	0°42′	IR40TR											•				•	•	•	•	○										•	•	○
TR110×4	4	108	0°41′	IR40TR											•				•	•	•	•	○										•	•	○
TR115×6	6	112	0°59′	IR60TR																			•	•	○										
TR120×6	6	117	0°56′	IR60TR																			•	•	○										
TR125×6	6	122	0°54′	IR60TR																			•	•	○										
TR130×6	6	127	0°52′	IR60TR																			•	•	○										
TR135×6	6	132	0°50′	IR60TR																			•	•	○										
TR140×6	6	137	0°48′	IR60TR																			•	•	○										
TR145×6	6	142	0°46′	IR60TR																			•	•	○										
TR150×6	6	147	0°45′	IR60TR																			•	•	○										
TR155×6	6	152	0°43′	IR60TR																			•	•	○										
TR160×6	6	157	0°42′	IR60TR																			•	•	○										
TR165×6	6	162	0°41′	IR60TR																			•	•	○										
TR170×6	6	167	0°39′	IR60TR																			•	•	○										

Note : The above tables show correspondence of internal toolholders at the time of setting clearance between thread and toolholder to 3 mm (1 mm in case of SN type) and the finishing stock to 0.1 mm.

Parallel pipe thread (PF) This table is also applied to G, Rp, and PS type threads.

Nominal size	TPI	Pitch	Effective diameter	Lead angle	Shank material		Steel shank										Carbide shank										"Tsuppari-Ichiban"						
					Insert size	Holder Cat. No.	6IR		11IR			16IR					6IR			11IR			16IR	16IR									
							SNR0006H06-2	SNR0008H06-2	SNR0010K11	SNR0010K11-2	SNR0013L11	SNR0013L11-2	SNR0016M16	SNR0016M16-2	CNR0020P16	CNR0025R16	CNR0032S16	(CNR0040T16)	(CNR0050U16)	SNR0006K06SC-2	SNR0006K06SC-3	SNR0008K06SC-2	SNR0008K06SC-3	SNR0010M11SC	SNR0010M11SC-2	SNR0012P11SC	SNR0012P11SC-2	SNR0016R16SC	SNR0016R16SC-2	TSNR0016Q16	TCNR0020R16DT	TCNR0025S16DT	(TCNR0032T16DT)
PF1/4	19	1.34	12.30	1°59'	IR19W	•	○											•		○													
PF3/8	19	1.34	15.81	1°33'	IR19W	•	•											•		○													
PF1/2	14	1.81	19.79	1°40'	IR14W				•				○										•			○							
PF5/8	14	1.81	21.75	1°31'	IR14W				•			○											•			○							
PF3/4	14	1.81	25.08	1°19'	IR14W			•			•		○										•		•			○					
PF7/8	14	1.81	29.04	1°08'	IR14W			•			•												•		•				○				
PF1	11	2.31	31.77	1°20'	IR11W						•			○									•		•					○			
PF1-1/8	11	2.31	36.42	1°09'	IR11W						•			•	○									•		•			○				
PF1-1/4	11	2.31	40.43	1°02'	IR11W						•			•	○									•		•			○				
PF1-1/2	11	2.31	46.32	0°55'	IR11W						•			•	•	○								•		•			•		○		
PF1-3/4	11	2.31	52.27	0°48'	IR11W						•			•	•	•	○							•		•			•		○		
PF2	11	2.31	58.14	0°43'	IR11W						•			•	•	•	○							•		•			•		○		
PF2-1/4	11	2.31	64.23	0°39'	IR11W						•			•	•	•	•	○						•		•			•		○		
PF2-1/2	11	2.31	73.71	0°34'	IR11W						•			•	•	•	•	○						•		•			•		○		
PF2-3/4	11	2.31	80.06	0°32'	IR11W						•			•	•	•	•	○						•		•			•		○		
PF3	11	2.31	86.41	0°29'	IR11W									○	○	○	○	○															
PF3-1/2	11	2.31	98.85	0°26'	IR11W										○	○	○	○	○														
PF4	11	2.31	111.55	0°23'	IR11W										○	○	○	○	○														
PF4-1/2	11	2.31	124.25	0°20'	IR11W										○	○	○	○	○														
PF5	11	2.31	136.95	0°18'	IR11W										○	○	○	○	○														
PF6	11	2.31	162.35	0°16'	IR11W										○	○	○	○	○														
PF7	11	2.31	187.35	0°13'	IR11W										○	○	○	○	○														
PF8	11	2.31	213.15	0°12'	IR11W										○	○	○	○	○														
PF9	11	2.31	238.55	0°11'	IR11W										○	○	○	○	○														
PF10	11	2.31	263.95	0°10'	IR11W										○	○	○	○	○														
PF12	11	2.31	314.75	0°08'	IR11W										○	○	○	○	○														

○ : Change the shim to AN16-0

○ : Change the shim to AN16-0DT

Taper pipe thread (PT) This table is also applied to Rc type pipe thread.

Nominal size	TPI	Pitch	Effective diameter	Lead angle	Shank material		Steel shank										Carbide shank								"Tsuppari-Ichiban"										
					Insert size	Holder Cat. No.	6IR		11IR		16IR						6IR		11IR			16IR	16IR												
							SNR0006H06-2	SNR0006H06-3	SNR0008H06-2	SNR0008H06-3	SNR0010K11	SNR0010K11-2	SNR0013L11	SNR0013L11-2	SNR0016M16	SNR0016M16-2	CNR0020P16	CNR0025R16	CNR0032S16	(CNR0040T16)	(CNR0050U16)	SNR0006K06SC-2	SNR0006K06SC-3	SNR0008K06SC-2	SNR0008K06SC-3	SNR0010M11SC	SNR0010M11SC-2	SNR0012P11SC	SNR0012P11SC-2	SNR0016R16SC	SNR0016R16SC-2	TSNR0016Q16	TCNR0020R16DT	TCNR0025S16DT	(TCNR0032T16DT)
PT1/4	19	1.34	12.30	1°59'	IR19PT	○													○																
PT3/8	19	1.34	15.81	1°33'	IR19PT	•		○											•		○														
PT1/2	14	1.81	19.79	1°40'	IR14PT						○												•			○									
PT3/4	14	1.81	25.28	1°19'	IR14PT									○									•		•			○			○				
PT1	11	2.31	31.77	1°20'	IR11PT									•		○													○		•	○			
PT1 1/4	11	2.31	40.43	1°02'	IR11PT									•		•	○												○		•	•	○		
PT1 1/2	11	2.31	46.32	0°55'	IR11PT									•		•	•	○											○		•	•	•	○	
PT2	11	2.31	58.14	0°43'	IR11PT									•		•	•	•	○										○		•	•	•	○	
PT2 1/2	11	2.31	73.71	0°34'	IR11PT									•		•	•	•	•	○									○		•	•	•	○	
PT3	11	2.31	86.41	0°29'	IR11PT											0	0	0	0	0	0											0	0	0	
PT3 1/2	11	2.31	98.85	0°26'	IR11PT											0	0	0	0	0	0											0	0	0	
PT4	11	2.31	111.55	0°23'	IR11PT											0	0	0	0	0	0											0	0	0	
PT5	11	2.31	136.95	0°18'	IR11PT											0	0	0	0	0	0											0	0	0	
PT6	11	2.31	162.35	0°16'	IR11PT											0	0	0	0	0	0											0	0	0	
PT7	11	2.31	187.75	0°13'	IR11PT											0	0	0	0	0	0											0	0	0	
PT8	11	2.31	213.15	0°12'	IR11PT											0	0	0	0	0	0											0	0	0	
PT9	11	2.31	238.55	0°11'	IR11PT											0	0	0	0	0	0											0	0	0	
PT10	11	2.31	263.95	0°10'	IR11PT											0	0	0	0	0	0											0	0	0	
PT12	11	2.31	314.75	0°08'	IR11PT											0	0	0	0	0	0											0	0	0	

○ : Change the shim to AN16-0

○ : Change the shim to AN16-0DT

Note : The above tables show correspondence of internal toolholders at the time of setting clearance between thread and toolholder to 3 mm (1 mm in case of SN type) and the finishing stock to 0.1 mm.

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Selection of ST-type Toolholders

■ Taper pipe thread (NPT)

Nominal size	TPI	Pitch	Lead angle	Shank material	Steel shank										Carbide shank				"Tsuppari-Ichiban"									
				Insert size	6IR				16IR						6IR				16IR		16IR							
				Holder Cat. No.	SNR0006H06-2	SNR0006H06-3	SNR0008H06-2	SNR0008H06-3	SNR0016M16	SNR0016M16-2	SNR0016M16-3	CNR0020P16	CNR0025R16	CNR0032S16	(CNR0040T16)	(CNR0050U16)	SNR0006K06SC-2	SNR0006K06SC-3	SNR0008K06SC-2	SNR0008K06SC-3	SNR0016R16SC	SNR0016R16SC-2	(SNR0016R16SC-3)	TSNR0016Q16	TCNR0020R16DT	TCNR0025S16DT	(TCNR0032T16DT)	
				Insert Cat. No.																								
3/8NPT	18	1.41	1°37′	IR18NPT	•		○										•		○									
1/2NPT	14	1.81	1°40′	IR14NPT																								
3/4NPT	14	1.81	1°19′	IR14NPT						○												○			○			
1NPT	11.5	2.21	1°17′	IR115NPT						○			○									○			•	○		
1 1/4NPT	11.5	2.21	1°00′	IR115NPT						○			•	•	○							○			•	•	•	○
1 1/2NPT	11.5	2.21	0°52′	IR115NPT						○			•	•	○							○			•	•	•	○
2NPT	11.5	2.21	0°41′	IR115NPT						○			•	•	•	•	○					○			•	•	•	○
2 1/2NPT	8	3.175	0°50′	IR8NPT						○			•	•	•	•	○					○			•	•	•	○
3NPT	8	3.175	0°40′	IR8NPT						○			•	•	•	•	○					○			•	•	•	○
3 1/2NPT	8	3.175	0°35′	IR8NPT						○			•	•	•	•	○					○			•	•	•	○
4NPT	8	3.175	0°31′	IR8NPT						○			•	•	•	•	○					○			•	•	•	○
5NPT	8	3.175	0°25′	IR8NPT									0	0	0	0	0								0	0	0	0
6NPT	8	3.175	0°21′	IR8NPT									0	0	0	0	0								0	0	0	0
8NPT	8	3.175	0°16′	IR8NPT									0	0	0	0	0								0	0	0	0
10NPT	8	3.175	0°13′	IR8NPT									0	0	0	0	0								0	0	0	0
12NPT	8	3.175	0°11′	IR8NPT									0	0	0	0	0								0	0	0	0
14NPT	8	3.175	0°10′	IR8NPT									0	0	0	0	0								0	0	0	0
16NPT	8	3.175	0°09′	IR8NPT									0	0	0	0	0								0	0	0	0
18NPT	8	3.175	0°08′	IR8NPT									0	0	0	0	0								0	0	0	0
20NPT	8	3.175	0°07′	IR8NPT									0	0	0	0	0								0	0	0	0
24NPT	8	3.175	0°06′	IR8NPT									0	0	0	0	0								0	0	0	0

○ : Change the shim to AN16-0

○ : Change the shim to AN16-0DT

■ 29° trapezoidal thread (ACME)

Nominal size	TPI	Pitch	Effective diameter	Lead angle	Shank material	Steel shank										Carbide shank			"Tsuppari-Ichiban"						
					Insert size	16IR						22IR				27IR		16IR			16IR		22IR		
					Holder Cat. No.	SNR0016M16	SNR0016M16-2	SNR0016M16-3	CNR0020P16	CNR0025R16	CNR0032S16	SNR0020Q22	SNR0020Q22-2	SNR0020Q22-3	CNR0025R22	CNR0032S22	CNR0040T27	(CNR0050U27)	SNR0016R16SC	SNR0016R16SC-2	SNR0016R16SC-3	TSNR0016Q16	TCNR0020R16DT	TCNR0025S22DT	TCNR0032T22DT
					Insert Cat. No.																				
3/8	12	2.12	8.465	4°33´	IR12ACME																				
7/16	12	2.12	10.053	3°50´	IR12ACME																				
1/2	10	2.54	11.43	4°03´	IR10ACME																				
5/8	8	3.18	14.274	4°03´	IR8ACME																				
3/4	6	4.23	16.934	4°33´	IR6ACME																				
7/8	6	4.23	20.109	3°50´	IR6ACME																				
1	5	5.08	22.86	4°03´	IR5ACME																				
1-1/8	5	5.08	26.035	3°33´	IR5ACME																				
1-1/4	5	5.08	29.21	3°10´	IR5ACME																				
1-3/8	4	6.35	31.75	3°39´	IR4ACME																				
1-1/2	4	6.35	34.925	3°19´	IR4ACME																				
1-3/4	4	6.35	41.275	2°48´	IR4ACME																				
2	4	6.35	47.625	2°26´	IR4ACME																				

Because this thread standard is characterized with large pitch and small diameter, (that is a large lead angle) the standard inserts and toolholders can not be used for machining this thread type. The application is limited to outside of the standard.

Note : The above tables show correspondence of internal toolholders at the time of setting clearance between thread and toolholder to 3 mm (1 mm in case of SN type) and the finishing stock to 0.1 mm.

Standard Cutting Conditions and Infeed Methods

Standard cutting conditions

Work material	Hardness	Cutting speed: v_c (m/min)			
		AH725	T313V	NS730	TH10
Carbon steels	< 200HB	80 ~ 180	100 ~ 200	150 ~ 200	–
	> 200HB	60 ~ 160	100 ~ 150	100 ~ 170	–
Stainless steels	–	50 ~ 130	70 ~ 130	–	–
Cast irons	–	–	70 ~ 150	–	70 ~ 90
Non-ferrous metals	–	–	–	–	100 ~ 500
Heat-resisting alloys	–	–	–	–	10 ~ 40
Hard materials	50 ~ 60HRC	–	–	–	10 ~ 30

Threading Guidelines





Determine the infeed per pass and number of threads whilst referring to the table and description below.

Pitch	0.5	0.75	1	1.25	1.5	1.75	2	2.5	3	3.5	4	4.5	5 ~
No. of threads	48	32	24	20	16	14	12	10	8	7	6	5.5	5 ~
No. of passes	4 ~ 6	4 ~ 7	4 ~ 8	5 ~ 9	6 ~ 10	7 ~ 12	7 ~ 12	8 ~ 14	10 ~ 16	11 ~ 18	11 ~ 18	11 ~ 19	12 ~ 24

Note:

- When using the full-profile insert, set the total infeed amount by taking the finish stock of 0.1mm into account.
- Set the first infeed to 150 ~ 200% of nose R and do not allow it to exceed 0.5 mm.
- The infeed amount during the final pass must be a minimum of 0.05 mm. No zero cuts should be made. (Extra small infeed or zero cutting of work hardened surfaces will reduce tool life.)
- The partial-profile insert or inside diameter insert has small nose R. Reduce the infeed per pass and increase the no. of passes.
- Regarding standard infeed per passes and no. of passes, please refer to our catalogue.

Infeed Methods for ST-type Tools

Infeed method	Features
 <p>Straight infeed (radial infeed)</p>	<ul style="list-style-type: none"> Most simple and usual method Suitable for relatively small pitch threads of easily machinable material. Chip contact length on right and left is longer, causing chattering, with increased load on the nose end. When the half included angle is not symmetrical to the right and left, infeeding in the direction of 1/2 of the included angle will ensure equal machining with right and left cutting edges.
 <p>Single edge infeed (flank infeed)</p>	<ul style="list-style-type: none"> Suitable for large pitch threads or easy to tear materials. Effectively prevents chattering. Chips are discharged in one direction only. Satisfactory chip control. Edge on the right (with zero infeed) tends to be worn heavily.
 <p>Modified single-edge infeed (flank infeed)</p>	<ul style="list-style-type: none"> Suitable for large pitch threads or easy to tear materials. Effectively prevents chattering. Chips are discharged in one direction only. Satisfactory chip control. Edge on the right performs some cutting, therefore wear of this edge can thus be suppressed.
 <p>Alternating flank infeed</p>	<ul style="list-style-type: none"> Suitable for large pitch threads or easy to tear material. Effectively prevents chattering. Chips are discharged alternately in right and left directions, resulting possibly in entanglement. Right and left edges are used alternately, ensuring uniform wear and extending tool life.

Infeed per Pass and Number of Passes

ISO metric full-profile inserts (for external)

Pitch	0.5	0.75	1	1.25	1.5	1.75	2	2.5	3	3.5	4	4.5	5	5.5	6
Height of thread	0.32	0.47	0.63	0.79	0.95	1.11	1.27	1.58	1.9	2.21	2.53	2.85	3.16	3.48	3.8
Total depth of cut	0.42	0.57	0.73	0.89	1.05	1.21	1.37	1.68	2	2.31	2.63	2.95	3.26	3.58	3.9
Number of passes	1	0.15	0.18	0.25	0.25	0.3	0.3	0.3	0.35	0.35	0.4	0.4	0.45	0.5	0.5
	2	0.12	0.12	0.2	0.2	0.25	0.25	0.25	0.3	0.3	0.35	0.35	0.35	0.35	0.4
	3	0.1	0.12	0.13	0.15	0.2	0.2	0.2	0.25	0.25	0.3	0.3	0.3	0.3	0.3
	4	0.05	0.1	0.1	0.14	0.15	0.16	0.2	0.23	0.2	0.25	0.25	0.25	0.25	0.25
	5		0.05	0.05	0.1	0.1	0.15	0.15	0.2	0.2	0.21	0.2	0.2	0.25	0.23
	6				0.05	0.05	0.1	0.12	0.15	0.15	0.2	0.2	0.2	0.2	0.2
	7					0.05	0.1	0.15	0.15	0.15	0.15	0.2	0.2	0.2	0.2
	8						0.05	0.1	0.15	0.15	0.15	0.15	0.18	0.15	0.15
	9							0.05	0.1	0.15	0.15	0.15	0.15	0.15	0.15
	10								0.1	0.1	0.13	0.15	0.15	0.15	0.15
	11								0.05	0.1	0.1	0.15	0.13	0.15	0.15
	12									0.05	0.1	0.1	0.1	0.15	0.15
	13										0.1	0.1	0.1	0.15	0.15
	14										0.05	0.1	0.1	0.1	0.15
	15											0.1	0.1	0.1	0.1
	16											0.05	0.1	0.1	0.1
	17												0.1	0.1	0.1
	18												0.05	0.1	0.1
	19													0.1	0.1
	20													0.05	0.1
	21														0.1
	22														0.05
	23														
	24														

ISO metric full-profile inserts (for internal)

Pitch	0.5	0.75	1	1.25	1.5	1.75	2	2.5	3	3.5	4	4.5	5	5.5	6
Height of thread	0.29	0.43	0.58	0.72	0.87	1.01	1.16	1.45	1.74	2.03	2.32	2.61	2.9	3.19	3.48
Total depth of cut	0.39	0.53	0.68	0.82	0.97	1.11	1.26	1.55	1.84	2.13	2.42	2.71	3	3.29	3.58
Number of passes	1	0.08	0.1	0.14	0.15	0.2	0.2	0.25	0.25	0.3	0.3	0.35	0.35	0.4	0.4
	2	0.07	0.09	0.13	0.13	0.16	0.18	0.18	0.22	0.22	0.25	0.25	0.25	0.25	0.25
	3	0.07	0.08	0.11	0.12	0.14	0.16	0.17	0.2	0.2	0.22	0.22	0.22	0.22	0.22
	4	0.06	0.08	0.1	0.11	0.12	0.14	0.16	0.18	0.18	0.2	0.2	0.2	0.2	0.2
	5	0.06	0.07	0.08	0.1	0.12	0.12	0.14	0.16	0.16	0.18	0.18	0.18	0.2	0.2
	6	0.05	0.06	0.07	0.09	0.1	0.1	0.12	0.15	0.15	0.16	0.18	0.18	0.18	0.18
	7		0.05	0.05	0.07	0.08	0.09	0.1	0.1	0.14	0.14	0.16	0.16	0.16	0.17
	8				0.05	0.05	0.07	0.08	0.1	0.13	0.13	0.14	0.14	0.14	0.16
	9						0.05	0.06	0.08	0.12	0.12	0.14	0.14	0.14	0.15
	10							0.05	0.06	0.1	0.11	0.12	0.12	0.13	0.14
	11								0.05	0.08	0.1	0.12	0.12	0.13	0.14
	12									0.06	0.1	0.1	0.12	0.12	0.13
	13										0.05	0.07	0.1	0.11	0.12
	14											0.05	0.09	0.1	0.12
	15												0.07	0.1	0.11
	16												0.05	0.09	0.1
	17													0.08	0.1
	18													0.05	0.1
	19														0.08
	20														0.05
	21														
	22														
	23														
	24														

Unified full-profile inserts

	For external							For internal						
No. of thread	24	20	18	16	14	12	8	24	20	18	16	14	12	8
Height of thread	0.67	0.8	0.89	1.01	1.15	1.34	2.01	0.61	0.74	0.82	0.92	1.05	1.23	1.84
Total depth of cut	0.77	0.9	0.99	1.11	1.25	1.44	2.11	0.71	0.84	0.92	1.02	1.15	1.33	1.94
Number of passes	1	0.25	0.25	0.28	0.3	0.3	0.35	0.2	0.2	0.2	0.2	0.25	0.25	0.3
	2	0.22	0.2	0.23	0.25	0.25	0.25	0.3	0.16	0.16	0.18	0.18	0.2	0.25
	3	0.15	0.16	0.18	0.18	0.23	0.21	0.25	0.12	0.13	0.15	0.16	0.18	0.22
	4	0.1	0.14	0.15	0.15	0.18	0.18	0.22	0.1	0.12	0.14	0.14	0.16	0.2
	5	0.05	0.1	0.1	0.1	0.14	0.15	0.2	0.08	0.1	0.1	0.11	0.13	0.18
	6		0.05	0.05	0.08	0.1	0.12	0.2	0.05	0.08	0.1	0.1	0.1	0.16
	7				0.05	0.05	0.1	0.16		0.05	0.05	0.08	0.08	0.1
	8						0.08	0.16				0.05	0.05	0.08
	9						0.05	0.12					0.08	0.12
	10							0.1					0.05	0.1
	11							0.05						0.1
	12													0.05
	13													
	14													

Whitworth full-profile inserts

	For external								For internal							
No. of thread	20	19	18	16	14	12	11	10	8	20	19	18	16	14	12	11
Height of thread	0.83	0.88	0.92	1.04	1.19	1.39	1.51	1.66	2.08	0.83	0.88	0.92	1.04	1.19	1.39	1.51
Total depth of cut	0.93	0.98	1.02	1.14	1.29	1.49	1.61	1.76	2.18	0.93	0.98	1.02	1.14	1.29	1.49	1.61
Number of passes	1	0.25	0.28	0.3	0.3	0.3	0.3	0.35	0.35	0.2	0.2	0.22	0.22	0.25	0.25	0.3
	2	0.2	0.22	0.24	0.25	0.25	0.25	0.3	0.3	0.18	0.18	0.18	0.18	0.21	0.21	0.25
	3	0.18	0.18	0.18	0.18	0.23	0.2	0.2	0.23	0.16	0.16	0.17	0.17	0.2	0.2	0.22
	4	0.15	0.15	0.15	0.14	0.2	0.18	0.18	0.2	0.14	0.16	0.16	0.16	0.18	0.18	0.2
	5	0.1	0.1	0.1	0.12	0.16	0.15	0.15	0.15	0.12	0.13	0.14	0.14	0.16	0.16	0.2
	6	0.05	0.05	0.05	0.1	0.1	0.14	0.14	0.14	0.08	0.1	0.1	0.12	0.14	0.14	0.18
	7				0.05	0.05	0.12	0.12	0.12	0.05	0.05	0.05	0.1	0.1	0.12	0.16
	8						0.1	0.12	0.12				0.05	0.05	0.1	0.12
	9						0.05	0.1	0.1					0.1	0.1	0.12
	10							0.05	0.05	0.1				0.05	0.1	0.11
	11								0.05						0.05	0.1
	12															0.05
	13															
	14															
	15															

30° Trapezoidal inserts

	For external					For internal				
Pitch	2	3	4	5	6	2	3	4	5	6
Height of thread	1.25	1.75	2.25	2.75	3.5	1.25	1.75	2.25	2.75	3.5
Total depth of cut	1.35	1.85	2.35	2.85	3.6	1.35	1.85	2.35	2.85	3.6
Number of passes	1	0.25	0.25	0.3	0.3	0.2	0.22	0.25	0.25	0.25
	2	0.2	0.22	0.25	0.25	0.18	0.2	0.22	0.22	0.22
	3	0.2	0.2	0.22	0.2	0.18	0.18	0.2	0.2	0.21
	4	0.18	0.18	0.2	0.2	0.16	0.16	0.2	0.18	0.2
	5	0.15	0.17	0.18	0.18	0.15	0.16	0.17	0.18	0.18
	6	0.12	0.16	0.16	0.16	0.13	0.16	0.16	0.16	0.18
	7	0.1	0.14	0.15	0.16	0.1	0.14	0.16	0.16	0.16
	8	0.1	0.14	0.14	0.15	0.16	0.1	0.14	0.14	0.15
	9	0.05	0.12	0.14	0.14	0.16	0.1	0.12	0.14	0.16
	10		0.12	0.12	0.14	0.16	0.05	0.12	0.12	0.14
	11		0.1	0.12	0.14	0.16		0.1	0.12	0.14
	12		0.05	0.12	0.12	0.15		0.1	0.12	0.12
	13			0.1	0.12	0.15		0.05	0.1	0.12
	14			0.1	0.12	0.15			0.1	0.12
	15			0.05	0.12	0.14			0.1	0.12
	16				0.1	0.14		0.05	0.1	0.14
	17				0.1	0.12			0.1	0.12
	18				0.1	0.12			0.1	0.12
	19			0.05	0.12				0.1	0.12
	20				0.12				0.05	0.12
	21				0.1					0.1
	22				0.1					0.1
	23				0.05					0.1
	24									0.05
	25									
	26									

29° Trapezoidal inserts

	For external			For internal		
No. of thread	8	6	5	8	6	5
Height of thread	1.88	2.41	2.92	1.88	2.41	2.92
Total depth of cut	1.98	2.51	3.02	1.98	2.51	3.02
Number of passes	1	0.25	0.25	0.25	0.22	0.22
	2	0.22	0.22	0.22	0.2	0.2
	3	0.2	0.2	0.2	0.18	0.18
	4	0.18	0.18	0.18	0.16	0.18
	5	0.16	0.17	0.18	0.16	0.16
	6	0.16	0.16	0.16	0.16	0.15
	7	0.16	0.16	0.16	0.15	0.15
	8	0.14	0.14	0.14	0.14	0.14
	9	0.14	0.14	0.14	0.14	0.14
	10	0.12	0.14	0.14	0.12	0.14
	11	0.1	0.14	0.14	0.1	0.14
	12	0.1	0.12	0.14	0.1	0.12
	13	0.05	0.12	0.12	0.1	0.12
	14		0.12	0.12	0.05	0.12
	15		0.1	0.12		0.1
	16		0.1	0.12		0.1
	17		0.05	0.12		0.1
	18			0.12	0.05	0.12
	19			0.1		0.1
	20			0.1		0.1
	21			0.05		0.1
	22					0.05
	23					
	24					
	25					
	26					

PT full-profile inserts

	For external				For internal		
No. of thread	28	19	14	11	19	14	11
Height of thread	0.6	0.86	1.16	1.48	0.86	1.16	1.48
Total depth of cut	0.7	0.96	1.26	1.58	0.96	1.26	1.58
Number of passes	1	0.25	0.28	0.3	0.22	0.25	0.25
	2	0.2	0.2	0.25	0.2	0.22	0.22
	3	0.1	0.18	0.2	0.18	0.18	0.18
	4	0.1	0.15	0.16	0.18	0.16	0.18
	5	0.05	0.1	0.11	0.15	0.1	0.12
	6		0.05	0.1	0.12	0.05	0.1
	7			0.1	0.11	0.05	0.1
	8			0.05	0.1		0.1
	9				0.1	0.05	0.1
	10				0.05		0.1
	11						0.05
	12						
	13						
	14						
	15						
	16						
	17						
	18						
	19						
	20						
	21						
	22						
	23						
	24						
	25						
	26						

NPT full-profile inserts

	For external				For internal		
No. of thread	18	14	11.5	8	14	11.5	8
Height of thread	1.14	1.47	1.79	2.58	1.47	1.79	2.58
Total depth of cut	1.24	1.57	1.89	2.68	1.57	1.89	2.68
Number of passes	1	0.2	0.25	0.25	0.3	0.22	0.22
	2	0.18	0.22	0.22	0.25	0.2	0.2
	3	0.17	0.2	0.2	0.2	0.18	0.2
	4	0.16	0.18	0.18	0.2	0.18	0.2
	5	0.14	0.17	0.18	0.2	0.16	0.2
	6	0.12	0.16	0.17	0.2	0.14	0.2
	7	0.12	0.12	0.16	0.18	0.12	0.18
	8	0.1	0.12	0.14	0.18	0.12	0.18
	9	0.05	0.1	0.12	0.16	0.1	0.12
	10		0.05	0.12	0.16	0.1	0.12
	11			0.1	0.14	0.05	0.1
	12			0.05	0.14		0.1
	13				0.12		0.05
	14				0.1		0.1
	15				0.1		0.1
	16				0.05		0.1
	17						0.05
	18						
	19						
	20						
	21						
	22						
	23						
	24						
	25						
	26						

Designation System for TAC Threading Tools (TT-type)

Insert

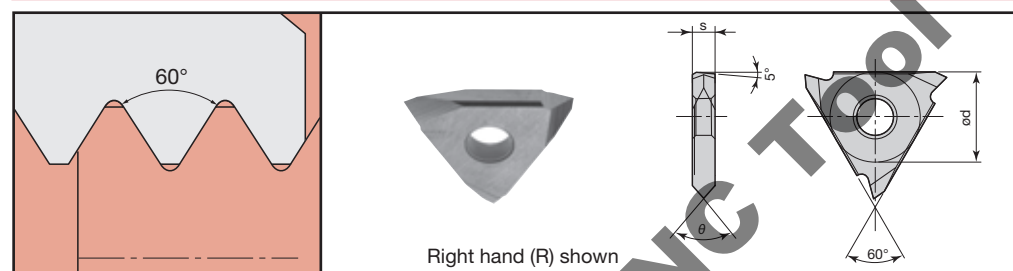
1	2	3	4
TT	R	42	M
-005			
1	2	3	4
1 Hand	2 Insert size (mm)	3 Thread type	4 Corner radius (mm)
R Right	Inscribed circle 12.7	M 60° thread angle	Blank 0
L Left	Thickness 3.2	W 55° thread angle	-005 0.05

Toolholder

1	2	3	4
TT-	20	20	R
E			
1	2	3	4
1 Shank height (mm)	2 Shank width (mm)	3 Hand	4 External or Internal
		R Right	E External
		L Left	I Internal

TT-type Inserts

60° metric



Partial-profile inserts for external and internal threads

Pitch	No. of threads	Hand of cut	Cat. No.	Grades		Dimensions (mm)			Applicable toolholders
				Uncoated	Cermet	ød	s	θ	
≤ 3	≥ 8	R	TTR42M	TH10	NS530	12.7	3.2	60°	TT-□□□□RE/LI
		L	TTL42M						TT-□□□□LE/RI
≤ 3	≥ 8	R	TTR42M-005	●	●	12.7	3.2	60°	TT-□□□□RE/LI
		L	TTL42M-005	●	●				TT-□□□□LE/RI

TT-type Inserts

55° Whitworth



Partial-profile inserts for external and internal threads

Pitch	No. of threads	Hand of cut	Cat. No.	Grades		Dimensions (mm)			Applicable toolholders
				Uncoated	Cermet	ød	s	θ	
≤ 3	≥ 8	R	TTR42W	TH10	NS530	12.7	3.2	55°	TT-□□□□RE/LI
		L	TTL42W						TT-□□□□LE/RI
≤ 3	≥ 8	R	TTR42W-005	●	●	12.7	3.2	55°	TT-□□□□RE/LI
		L	TTL42W-005	●	●				TT-□□□□LE/RI

Packing Quantity : 5pcs.

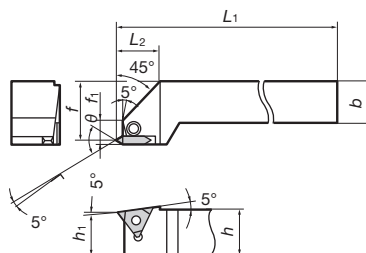
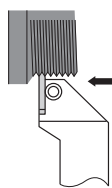
● : Stocked items.

Pitch
~3mmPitch Number of
Threads
8~3
No. of corners

External threading

External threading

TT-R/LE



Right hand (R) shown.

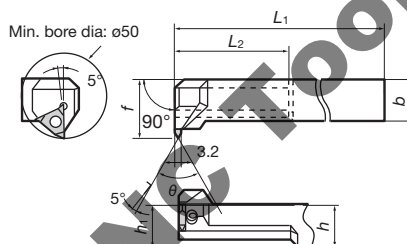
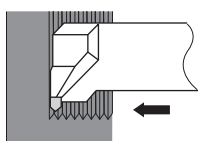
Cat. No.	Hand of cut	Stock	Dimensions (mm)							Applicable inserts	Parts		
			h	b	L ₁	L ₂	h ₁	f	f ₁		①Clamp	②Clamping screw	Wrench
TT-2020RE	R		20	20	125		20	25		TTR42□○○○	CP91	DS-6	P-3
TT-2020LE	L					25			15	TTL42□○○○			
TT-2525RE	R	●	25	25	150		25	32		TTR42□○○○			
TT-2525LE	L	●								TTL42□○○○			

Pitch
~3mmPitch Number of
Threads
8~3
No. of corners

Internal threading

Internal threading

TT-R/LI

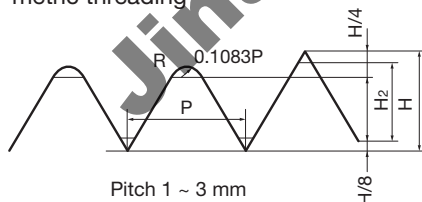


Right hand (R) shown.

Cat. No.	Hand of cut	Stock	Dimensions (mm)							Applicable inserts	Parts		
			h	b	L ₁	L ₂	h ₁	f	f ₁		①Clamp	②Clamping screw	Wrench
TT-2020RI	R		20	20	160	60	20	30		TTL42□○○○	CP91	DS-6	P-3
TT-2020LI	L									TTR42□○○○			
TT-2525RI	R	●	25	25	200	70	25	35		TTL42□○○○			
TT-2525LI	L									TTR42□○○○			

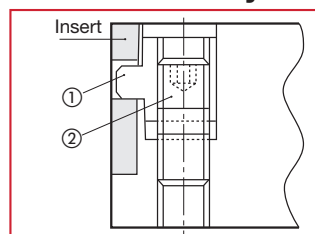
Notes : When using a right or left hand insert, the right hand insert is used for left hand toolholders and left hand insert is used for right hand toolholders.

- Relationship between pitch, depth of cut and number of passes for external metric threading



Note: Maximum machinable pitch is 3 mm.

● Part assembly



	P	1	1.25	1.5	1.75	2	2.5	3
	H ₂	0.6	0.76	0.92	1.09	1.25	1.57	1.9
	H	0.866	1.083	1.299	1.516	1.732	2.165	2.598
Number of passes	1	0.25	0.3	0.3	0.3	0.35	0.4	0.4
	2	0.15	0.2	0.25	0.25	0.25	0.3	0.35
	3	0.1	0.1	0.15	0.2	0.2	0.25	0.28
	4	0.05	0.06	0.1	0.1	0.16	0.2	0.2
	5	0.05	0.06	0.05	0.1	0.1	0.15	0.2
	6		0.06	0.05	0.07	0.07	0.1	0.13
	7			0.02	0.05	0.05	0.07	0.1
	8				0.02	0.02	0.05	0.1
	9					0.02	0.03	0.05
	10						0.02	0.05
	11							0.02
	12							0.02

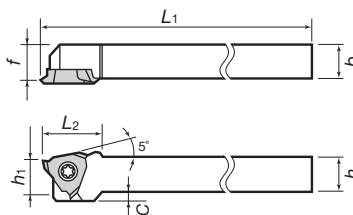
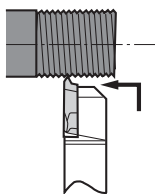
● : Stocked items.

JSTT R/L

Pitch
0.5~1mmPitch Number of
Threads
48~243
No. of cornersWithout offset
J-type • Screw-on type

External threading

JSTTR/L



Can be wrenched from back side with both-end Torx screw.

Right hand (R) shown.

Cat. No.	Stock		Dimensions (mm)							Applicable inserts	Clamping screw	Wrench	
	R	L	h	b	L ₁	L ₂	h ₁	f	C				
JSTTR/L1010K3	●		10	10			10	9.5	2	JTTR/L3□□□□	CSTB-4SD	T-8F	(T-8L) * Optional
JSTTR/L1212K3	●		12	12	125	16.5	12	11.5	—				
JSTTR/L1616K3	●		16	16			16	15.5	—				

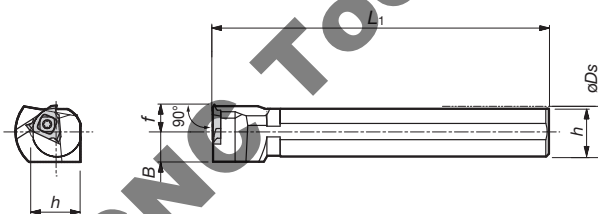
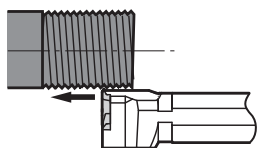
JS-TTL3

Pitch
0.5~1mmPitch Number of
Threads
48~243
No. of corners

J-type • Screw-on type

External threading

JS-TTL3



Left hand (L) shown.

Cat. No.	Stock	Dimensions (mm)							Applicable inserts	Clamping screw	Wrench
		øDs	f	L ₁	L ₂	h	B				
JS19K-TTL3	●	19.05				18			JTTR30□□F	CSTB-4S	T-15F
JS20K-TTL3	●	20				19	11.5				
JS22K-TTL3	●	22				21					
JS25K-TTL3	●	25.4				24	12.7				

JTT-type inserts (sharp edge)

	Cat. No.	Dimensions (mm)				Stocked grades											
		θ	ød	s	r _ε	Coated		Coated Cermet				Cermet				Uncoated	
						J740		J530		NS530				TH10			
						R	L	R	L	R	L	R	L	R	L		
JTTR/L3005F-55	55°	9.525	3.18	0.05	●												
JTTR/L3005F	60°				●					●				●			
JTTR/L3010F				0.1	●						●				●		

Notes: Left hand holder use right hand insert.
Machinable pitch range: 0.5 to 1 mm.

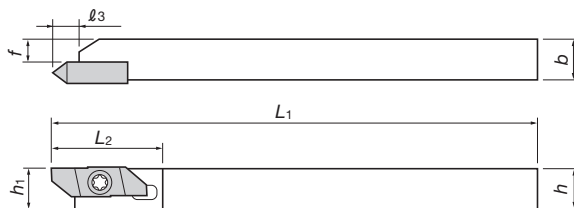
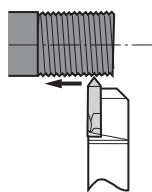
● : Stocked items.

Pitch
0.5~1mmPitch Number of
Threads
48~242
No. of corners

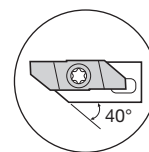
J-type • Screw-on type

External threading

JSXBR/L






JSXB type toolholders are also used for back turning JXB-type inserts.



C-type

- Can be wrenched from back side with both end torx screw.
- This toolholder is also compatible with JSXB-type insert for back turning.

Right hand (R) shown

Cat. No.	Stock		Dimensions (mm)							Applicable inserts	Clamping screw	Wrench	
	R	L	h	b	L ₁	L ₂	ℓ ₃	h ₁	f				
JSXBR/L1010K8-C	●	●	10	10	125	29	6.4	10	5.7	JXT□R/L□□□□□	CSTB-4SD	T-8F	(T-8L) * Optional
JSXBR/L1212K8-C	●	●	12	12				12	7.7				
JSXBR/L1616K8	●	●	16	16				16	11.7				
JSXBR/L2020K8	●	●	20	20				20	15.7				
JSXBR/L2525K8	●	●	25	25				25	20.7				

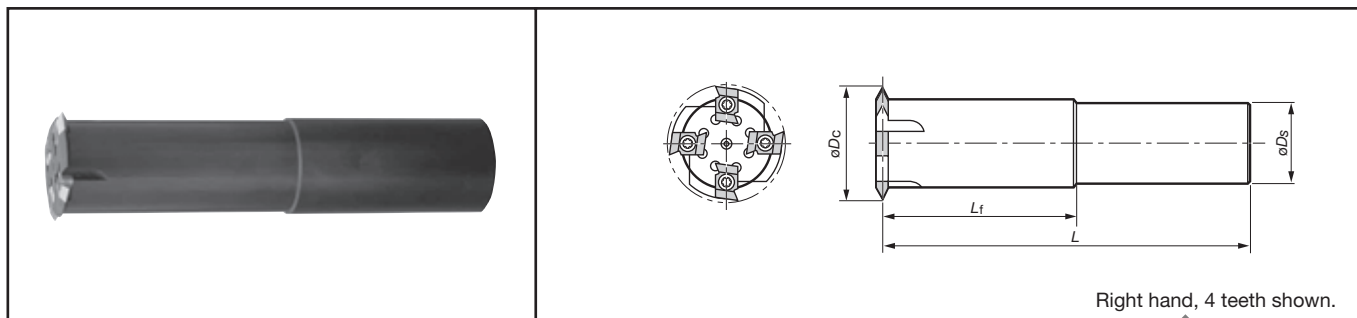
JXT-type inserts (sharp edge)

Cat. No.	Dimensions (mm)				Stocked grades							
	θ	ød	s	r _e	Coated		Cermet				Uncoated	
					J740		NS530				TH10	
					R	L	R	L	R	L	R	L
JXT1R/L6000F	60°	8	3.97	0.03	●		●				●	
JXT2R/L6000F					●		●				●	
JXT3R/L6000F												

Notes: Right hand holder use right hand insert and left hand holder use left hand insert.

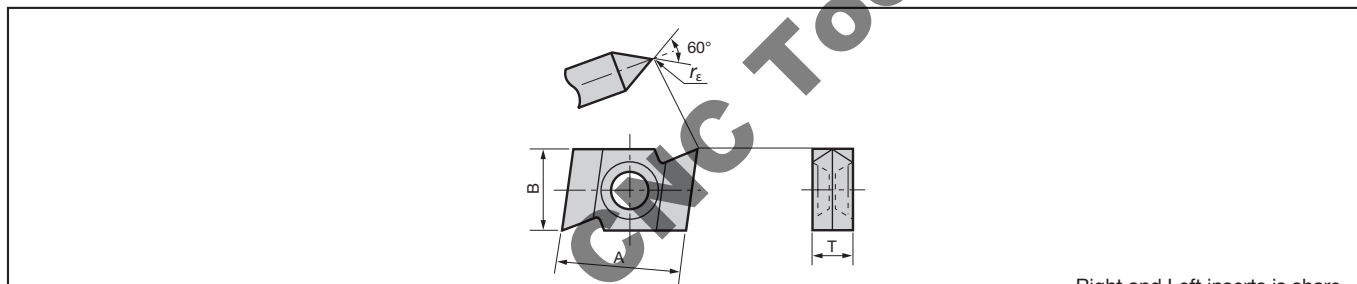
Machinable pitch range: 0.5 to 1 mm.

● : Stocked items



Cat. No.	Stock		No. of teeth	Dimensions (mm)				Applicable inserts	Clamping screw	Wrench	Range of Internal thread
	R	L		ϕD_c	ϕD_s	L_f	L				
D23-D25-45R/L	○		1	23	25	45	115	T1-R□□	CSTB-4	T-15F	M28 ~ M30
D25-D25-45R/L	○		1	25	25	45	115				M32 ~ M42
D38-D32-85R/L	○		2	38	32	85	165				M45 ~ M56
D50-D42-100R/L	○		4	50	42	100	190				M58 ~ M68
D55-D42-100R/L	○		4	55	42	100	190	T2-R□□	CSTB-5	T-20F	M64 ~ M85
D60-D42-100R/L	○		4	60	42	100	190				M70 ~ M85
D80-D42-100R/L	○		6	80	42	100	190				M90 ~

Applicable Inserts



Cat. No.	Grade	Dimensions (mm)			
	GH330	A	B	T	r_E
T1-R14	○	14.4	9.525	4.76	0.14
T1-R28	○				0.28
T1-R35	○				0.35
T2-R14	○	17.8	12.70	6.35	0.14
T2-R28	○				0.28
T2-R35	○				0.35
T2-R42	○				0.42

Standard cutting conditions

Work materials	Grades	Cutting speed v_c (m/min)	Feed per tooth f_z (mm/t)
Mild steels • Unharded steels (< 200HB)	GH330	150 ~ 200	0.3 ~ 0.4
Carbon steels • Alloy steels (< 300HB)	GH330	150 ~ 200	0.17 ~ 0.26
Die steels (< 50HRC)	GH330	30 ~ 50	0.14 ~ 0.2
Stainless steels (< 300HB)	GH330	100 ~ 150	0.2 ~ 0.4

Notes on machining

- Climb milling is recommended.
- When threading a blind hole, use the right hand cutter in right hand rotation. Cut up from the bottom to prevent chip recutting.
- When machining internal threads from the mouth, use the left hand cutter in left hand rotation.

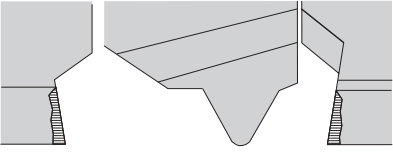
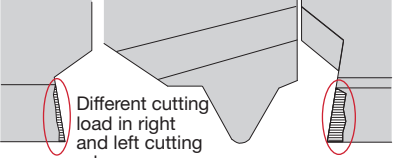
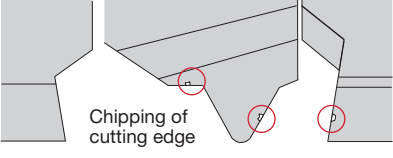
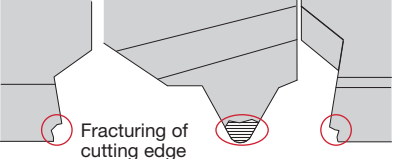
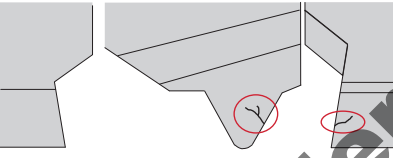
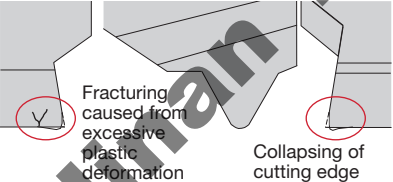
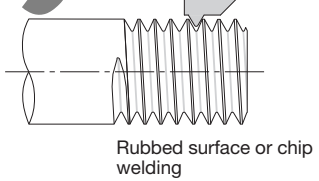
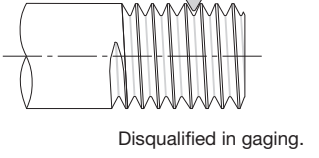
○ : Please contact our sales office.

Single tooth threading mills

Threading mills and applicable threads

Cutter dia.	Applicable Thread								Minor diameter of max. pitch thread	
	Thread type	Coarse screw thread	Fine screw thread						Coarse screw thread	Fine screw thread
D23 X 1 tooth T1-type of inserts	M28					2	1.5	1		25.835
	M30	3.5			3	2	1.5	1	26.211	
D25 X 1 tooth T1-type of inserts	M32					2	1.5			29.835
	M33	3.5			3	2	1.5		29.211	
	M35						1.5			33.376
	M36	4.0			3	2	1.5		31.670	
	M38						1.5			36.376
	M39	4.0			3	2	1.5		34.670	
	M40				3	2	1.5			36.752
D38 X 2 teeth T1-type of inserts	M42	4.5		4	3	2	1.5		37.129	
	M45				3	2	1.5		40.129	
	M48	5.0		4	3	2	1.5		42.587	
	M50				3	2	1.5			46.752
	M52	5.0		4	3	2	1.5		46.587	
	M55			4	3	2	1.5			50.670
D50 X 4 teeth T1-type of inserts	M56	5.5		4	3	2	1.5		50.046	
	M58				3	2	1.5			53.670
	M60			4	3	2	1.5		54.046	
	M62			4	3	2	1.5			57.670
	M64	6.0		4	3	2	1.5		57.505	
	M65			4	3	2	1.5			60.670
D55 X 4 teeth T2-type of inserts	M68	6.0		4	3	2	1.5		61.505	
	M64			4	3	2	1.5		57.505	
	M65			4	3	2	1.5			60.670
D60 X 4 teeth T2-type of inserts	M68	6.0		4	3	2	1.5		61.505	
	M70			4	3	2	1.5			63.505
	M72		6	4	3	2	1.5			65.505
	M75			4	3	2	1.5			70.670
	M76		6	4	3	2	1.5			69.505
	M78					2				75.835
	M80		6	4	3	2	1.5			73.505
	M82					2				79.835
D80 X 6 teeth T2-type of inserts	M85		6	4	3	2				78.505
	M90			4	3	2				83.505
	M95		6	4	3	2				88.505

Troubleshooting in Threading for ST-type Tools

Problem	Possible causes	Countermeasures
Excessive wear  <p>Flank wear develops.</p>	<ul style="list-style-type: none"> • Cutting speed too high. • Incorrect carbide grade. • Too many passes. • Too small depth of cut in finishing. • Poor coolant supply. 	<ul style="list-style-type: none"> • Reduce the cutting speed. • Change to a more wear resistant grade. • Reduce the number of passes. • Increase the depth of cut to at least 0.05 mm or more in final finishing. • Supply sufficient coolant to the cutting point.
Uneven wear in the left and right flank faces  <p>Different cutting load in right and left cutting edges.</p>	<ul style="list-style-type: none"> • Incorrect relief angles for the thread's lead angle. • Use of flank infeed. • Half angles of the thread are asymmetrical. 	<ul style="list-style-type: none"> • Select a proper shim. • Change to alternative flank infeed. • Coincide the infeed angle of the tool with a half angle of the thread.
Chipping  <p>Chipping of cutting edge</p>	<ul style="list-style-type: none"> • Too low cutting speed. • Too small honing width. 	<ul style="list-style-type: none"> • Increase the cutting speed. • Increase the honing width.
Edge breakage  <p>Fracturing of cutting edge</p>	<ul style="list-style-type: none"> • Recutting chips. • Caused from the work shape. • Unstable holding of the workpiece and the tool. 	<ul style="list-style-type: none"> • Supply sufficient coolant to the cutting point. • Chamfer the portion from which the tool enters the cut and add a groove to the portion from which the tool leaves the cut. The chamfer and groove should be larger than the thread height. • Reinforce the holding and select a tougher insert grade.
Insert cracking  <p>Cracks occur in cutting edge</p>	<ul style="list-style-type: none"> • Inconsistent coolant supply. • Too high cutting speed. • Incorrect grade selection. 	<ul style="list-style-type: none"> • Use constant flood coolant to the cutting point. • Reduce the cutting speed. • Change to a tougher grade.
Distinct plastic deformation  <p>Fracturing caused from excessive plastic deformation Collapsing of cutting edge</p>	<ul style="list-style-type: none"> • Too large depth of cut per pass. • Insufficient coolant supply. • Too high cutting speed. • Incorrect grade selection. 	<ul style="list-style-type: none"> • Reduce the depth of cut per pass. • Supply sufficient coolant to the cutting point. • Reduce the cutting speed. • Use a harder insert grade.
Poor surface finish  <p>Rubbed surface or chip welding</p>	<ul style="list-style-type: none"> • Improper relief angle. • Too low cutting speed. • Too rapid tool wear. 	<ul style="list-style-type: none"> • Select a proper shim. • Increase the cutting speed. • Change to a more wear resistant grade.
Inaccurate thread form  <p>Disqualified in gaging.</p>	<ul style="list-style-type: none"> • Inaccurate tool setting. • Insufficient thread height. • Too rapid tool wear. 	<ul style="list-style-type: none"> • Check and correct the cutting edge height and tool inclination by using a dial gage. • Check and correct the depth of cut. • Change to a more wear resistant grade.

Jinan Terry CNC Tool Co., Ltd.