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KENNAMETAL®

MASTER CATALOG 2018

VOLUME ONE | **TURNING** TOOLS

ISO/ANSI TURNING | GROOVING & CUT-OFF | THREADING | APPLICATION SPECIFIC

LT • Laydown Triangle Threading

Primary Application

Laydown triangle (LT) threading is the system of choice for fine-pitch threads, high-helix/multistart threads, and single-point threading in small-diameter bores. With a wide selection of CB-style chip control inserts, you will receive superior chip management for excellent surface finishes and minimal operator intervention. The low-profile design enables unrestricted chip flow — ideal for I.D. threads. Variable shim angles enable proper cutting geometry for high-helix angle and reverse helix angle threading, maximizing tool life and improving thread quality.

Features and Benefits

Precision-Ground Thread Form on LT and LT-CB

- Minimizes built-up edge.
- Precisely cuts most common materials.
- Reduces cutting forces.
- Ensures accurate, high-quality threads.

KC5010™ and KC5025™ Premium PVD TiAlN-Coated Grades

- Increase tool life at existing machining conditions.
- Increase productivity by outperforming conventional PVD grades with up to a 30% advantage in cutting speeds.

Superior Chip Control

- Eliminates long, troublesome coils.
- Excellent for internal threading operations.
- Available in both partial and full profile inserts for all common thread forms.

Kenna Universal™ Inserts

- Precision molded LT-K thread form provides outstanding utility and value.
- Excellent chip control combined with grade KU25T™ enables trouble-free threading on a variety of workpiece materials.

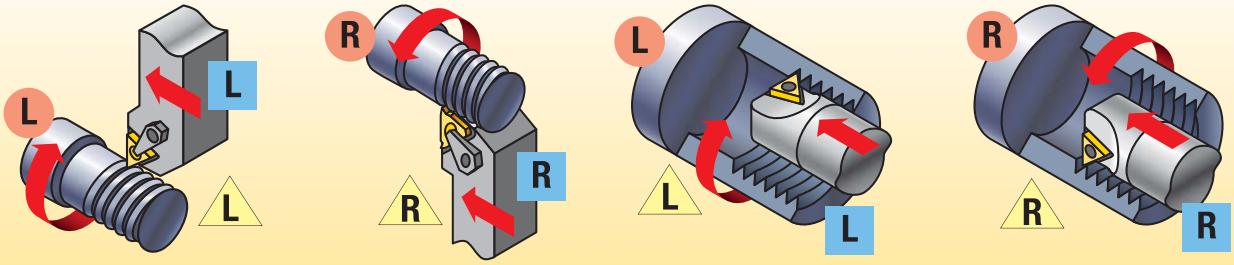

KENNAMETAL E20SLSER16 NX4

Step 1 • Select Threading Method and Hand of Tooling

Required Information:
- External/internal operation.
- Spindle rotation/hand of thread.
- Feed direction.

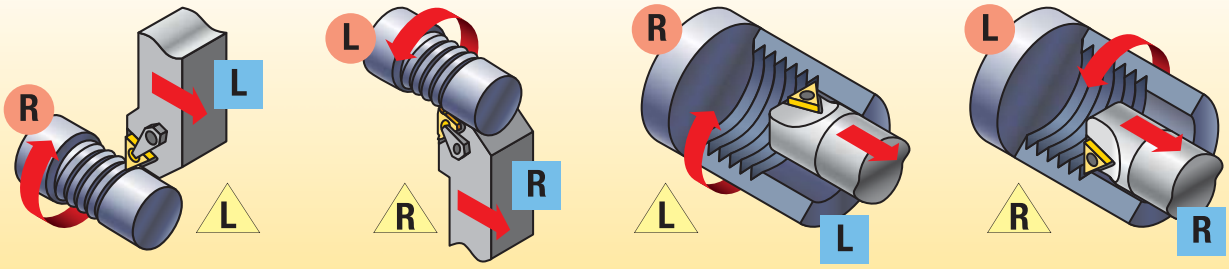
hand of thread | hand of toolholder | hand of insert

Feed direction toward the chuck • standard helix • RECOMMENDED



external left-hand thread | external right-hand thread | internal left-hand thread | internal right-hand thread

Feed direction away from the chuck • reverse helix*



external right-hand thread | external left-hand thread | internal right-hand thread | internal left-hand thread

**Negative shim required*

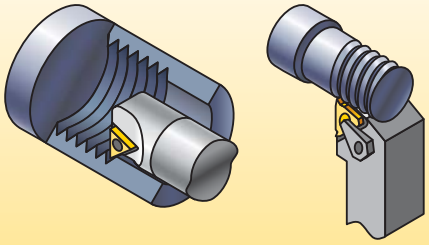
Step 2 • Select Holder from Catalog Page

Required Information:
- External/internal operation.
- Minimum bore diameter (for internal operations).
- Hand of tool.
- Insert size (gage insert).

The insert size must match the gage insert size of your toolholder selection:

catalog number	gage insert	minimum bore diameter	shim
S1212LSER3	LT16NR	.90"	SM-YI3
A2020LSER16	LT16NR	16mm	SM-YI3

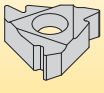
Select the appropriate holder for the insert size and hand:



Step 3 • Choose Insert for Application

- Select cresting inserts for fully controlled thread form including diameter.
- Cresting inserts eliminate the need for deburring and are optimized for the best tool life at that pitch.
- Non-cresting partial profile inserts offer the flexibility to cut a variety of thread pitches with one insert.
- Note insert size for toolholder selection.

NOTE: See threading insert overview on page D50.



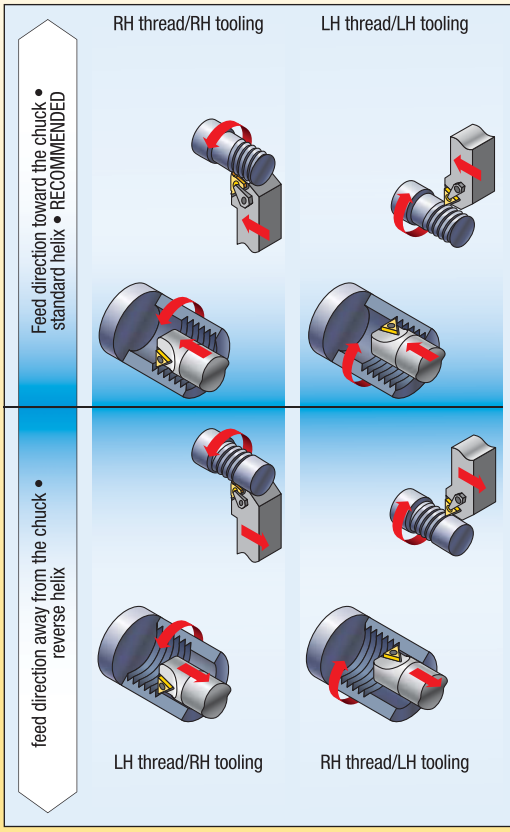
insert size	catalog number	KCU25/KC5025
11	**LT11NRA60**	•
16	**LT6NRAG60**	•

Step 4 • Select Appropriate Shim

Required Information:

- Thread form (TPI or pitch).
- Pitch diameter.
- Helix method (hand of tool, feed direction, hand of thread).
- Number of starts.

Select the proper shim: SMYE... for external RH or internal LH
SMYI... for internal RH or external LH

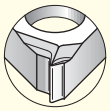
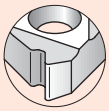
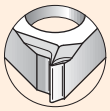
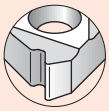


	toolholder		shim ordering code (inch)							
insert size	external	internal				standard				
3 (3/8")	RH	LH	SM-YE3-3P	SM-YE3-2P	SM-YE3-1P	SM-YE3	SM-YE3-1N	SM-YE3-1.5N	SM-YE3-2N	SM-YE3-3N
3 (3/8")	LH	RH	SM-YI3-3P	SM-YI3-2P	SM-YI3-1P	SM-YI3	SM-YI3-1N	SM-YI3-1.5N	SM-YI3-2N	SM-YI3-3N
4 (1/2")	RH	LH	SM-YE4-3P	SM-YE4-2P	SM-YE4-1P	SM-YE4	SM-YE4-1N	SM-YE4-1.5N	SM-YE4-2N	SM-YE4-3N
4 (1/2")	LH	RH	SM-YI4-3P	SM-YI4-2P	SM-YI4-1P	SM-YI4	SM-YI4-1N	SM-YI4-1.5N	SM-YI4-2N	SM-YI4-3N
TPI		pitch (mm)	pitch diameter (inch)							
72		–	–	–	–	0.12–0.31	0.32–0.84	>0.84	0.84–0.32	0.31–0.12
–		0.35	–	–	–	0.12–0.3	0.31–0.84	>0.84	0.84–0.31	0.3–0.12
64		–	–	–	–	0.14–0.35	0.36–0.95	>0.95	0.95–0.36	0.35–0.14
–		0.40	–	–	–	0.14–0.35	0.36–0.96	>0.96	0.96–0.36	0.35–0.14
56		0.45	–	–	–	0.16–0.4	0.41–1.09	>1.09	1.09–0.41	0.4–0.16
–		0.50	–	–	0.11–0.16	0.17–0.44	0.45–1.2	>1.20	1.2–0.45	0.44–0.17
48		–	–	–	0.12–0.17	0.18–0.46	0.47–1.27	>1.27	1.27–0.47	0.46–0.18
44		–	–	–	0.13–0.19	0.2–0.51	0.52–1.38	>1.38	1.38–0.52	0.51–0.2
–		0.60	–	0.1–0.12	0.13–0.2	0.21–0.53	0.54–1.44	>1.44	1.44–0.54	0.53–0.21
40		–	–	0.11–0.13	0.14–0.21	0.22–0.56	0.57–1.52	>1.52	1.52–0.57	0.56–0.22
–		0.70	–	0.12–0.15	0.16–0.23	0.24–0.62	0.63–1.68	>1.68	1.68–0.63	0.62–0.24
36		–	–	0.12–0.15	0.16–0.23	0.24–0.62	0.63–1.69	>1.69	1.69–0.63	0.62–0.24
–		0.75	0.11–0.12	0.13–0.16	0.17–0.25	0.26–0.66	0.67–1.8	>1.80	1.8–0.67	0.66–0.26
32		–	0.12–0.13	0.14–0.17	0.18–0.26	0.27–0.7	0.71–1.9	>1.90	1.9–0.71	0.7–0.27
–		0.80	0.12–0.13	0.14–0.17	0.18–0.26	0.27–0.71	0.72–1.91	>1.91	1.91–0.72	0.71–0.27
28		–	0.14–0.14	0.15–0.19	0.2–0.3	0.31–0.8	0.81–2.17	>2.17	2.17–0.81	0.8–0.31
27		–	0.14–0.15	0.16–0.2	0.21–0.31	0.32–0.83	0.84–2.25	>2.25	2.25–0.84	0.83–0.32
–		1.00	0.15–0.16	0.17–0.21	0.22–0.33	0.34–0.89	0.9–2.39	>2.39	2.39–0.9	0.89–0.34
24		–	0.16–0.17	0.18–0.23	0.24–0.35	0.36–0.94	0.95–2.53	>2.53	2.53–0.95	0.94–0.36
–		1.25	0.19–0.2	0.21–0.27	0.28–0.42	0.43–1.11	1.12–2.99	>2.99	2.99–1.12	1.11–0.43
20		–	0.19–0.21	0.22–0.27	0.28–0.42	0.43–1.13	1.14–3.04	>3.04	3.04–1.14	1.13–0.43
18		–	0.21–0.23	0.24–0.31	0.32–0.47	0.48–1.26	1.277–3.38	>3.38	3.38–1.27	1.26–0.48
–		1.50	0.22–0.25	0.26–0.33	0.34–0.5	0.51–1.34	1.35–3.59	>3.59	3.59–1.35	1.34–0.51
16		–	0.24–0.26	0.27–0.35	0.36–0.53	0.54–1.41	1.42–3.8	>3.80	3.8–1.42	1.41–0.54
–		1.75	0.26–0.29	0.3–0.38	0.39–0.59	0.6–1.56	1.57–4.19	>4.19	4.19–1.57	1.56–0.6
14		–	0.27–0.3	0.31–0.4	0.41–0.61	0.62–1.62	1.63–4.34	>4.34	4.34–1.63	1.62–0.62
13		–	0.29–0.32	0.33–0.43	0.44–0.66	0.67–1.74	1.75–4.68	>4.68	4.68–1.75	1.74–0.67
–		2.00	0.3–0.33	0.34–0.44	0.45–0.67	0.68–1.78	1.79–4.79	>4.79	4.79–1.79	1.78–0.68
12		–	0.32–0.35	0.36–0.46	0.47–0.71	0.72–1.89	1.9–5.07	>5.07	5.07–1.9	1.89–0.72
11.5		–	0.33–0.37	0.38–0.49	0.5–0.74	0.75–1.97	1.98–5.29	>5.29	5.29–1.98	1.97–0.75
11		–	0.34–0.38	0.39–0.51	0.52–0.78	0.79–2.06	2.07–5.53	>5.53	5.53–2.07	2.06–0.79
–		2.50	0.37–0.42	0.43–0.55	0.56–0.84	0.85–2.23	2.24–5.98	>5.98	5.98–2.24	2.23–0.85
10		–	0.38–0.42	0.43–0.56	0.57–0.86	0.87–2.27	2.28–6.08	>6.08	6.08–2.28	2.27–0.87
9		–	0.42–0.47	0.48–0.62	0.63–0.95	0.96–2.52	2.53–6.75	>6.75	6.75–2.53	2.52–0.96
–		3.00	0.45–0.5	0.51–0.66	0.67–1.02	1.03–2.68	2.69–7.18	>7.18	7.18–2.69	2.68–1.03
8		–	0.47–0.53	0.54–0.7	0.71–1.08	1.09–2.84	2.85–7.6	>7.60	7.6–2.85	2.84–1.09
–		3.50	0.52–0.59	0.6–0.77	0.78–1.19	1.2–3.13	3.14–8.38	>8.38	8.38–3.14	3.13–1.2
7		–	0.524–0.61	0.62–0.8	0.81–1.23	1.24–3.25	3.26–8.68	>8.68	8.68–3.26	3.25–1.24
–		4.00	0.6–0.67	0.68–0.89	0.9–1.36	1.37–3.58	3.59–9.57	>9.57	9.57–3.59	3.58–1.37
6		–	0.63–0.71	0.72–0.94	0.95–1.44	1.45–3.79	3.8–10.13	>10.13	10.13–3.8	3.79–1.45
–		5.00	0.75–0.84	0.85–1.11	1.12–1.7	1.71–4.48	4.49–11.97	>11.97	11.97–4.49	4.48–1.71
5		–	0.76–0.86	0.87–1.13	1.14–1.73	1.74–4.55	4.56–12.16	>12.16	12.16–4.56	4.55–1.74
4.5		–	0.84–0.95	0.96–1.26	1.27–1.92	1.93–5.06	5.07–13.51	>13.51	13.51–5.07	5.06–1.93
–		6.00	0.9–1.01	1.02–1.33	1.34–2.04	2.05–5.37	5.38–14.36	>14.36	14.36–5.38	5.37–2.05
4		–	0.95–1.07	1.08–1.41	1.42–2.16	2.17–5.69	5.7–15.2	>15.20	15.2–5.7	5.69–2.17
inclination angle			4.5	3.5	2.5	1.5	0.5	0.0	-0.5	-1.5
			standard helix (feed toward the chuck)						reverse helix (feed away from the chuck)	

If recommended shim is different from shim supplied with toolholder, order shim separately.
NOTE: Optimize your threading operation by using the proper infeed angle and the recommended infeed values.
See the Technical Section on pages D82–D105.
Also see detailed shim selection information on pages D104–D105.

Step 5 • Select Grade and Speed

Recommendations for Grade and Speed Selection — m/min (SFM)

	workpiece material	P	M	K	N	S
Kenna Perfect™	insert style	CB chipbreaker		Flat Top 	CB chipbreaker	
	optimum cutting conditions	**KC5010** 70–260 (240–850)	**KC5010** 90–245 (300–800)	**KC5010** 60–245 (200–800)	**KC5010** 90–550 (300–1800)	**KC5010** 30–150 (100–500)
	first choice	**KC5025** 50–230 (160–750)	**KC5025** 75–230 (250–750)	**KC5025** 50–180 (160–600)	**KC5025** 60–455 (200–1500)	**KC5025** 20–120 (75–400)
Kenna Universal™	insert style	-K chipbreaker				
	selection	**KU25T** 45–210 (145–675)	**KU25T** 70–205 (225–675)	**KU25T** 45–160 (145–540)	**KU25T** 55–410 (180–1350)	**KU25T** 20–110 (70–360)

NOTE: See threading insert overview on page D50.

Recommended Starting Speeds [m/min]

Material Group		KC5010			KC5025			KU25T		
P	0–1	135	**200**	260	105	**165**	230	95	**150**	210
	2	130	**190**	245	100	**150**	200	90	**135**	180
	3	105	**155**	200	75	**125**	170	70	**115**	155
	4	70	**120**	160	60	**95**	130	55	**85**	115
	5	105	**155**	200	75	**130**	170	70	**115**	155
	6	70	**120**	160	50	**90**	130	45	**80**	115
M	1	120	**180**	245	90	**170**	230	80	**155**	205
	2	90	**165**	210	75	**140**	200	70	**125**	180
	3	90	**165**	210	75	**135**	200	70	**120**	180
K	1	120	**180**	245	90	**135**	180	80	**120**	160
	2	90	**150**	210	70	**120**	170	65	**110**	155
	3	60	**105**	150	50	**85**	120	45	**75**	110
N	1–2	150	**365**	550	120	**305**	455	110	**275**	410
	3	90	**135**	180	60	**105**	150	55	**95**	135
	4	120	**305**	455	100	**200**	305	90	**180**	275
	5	90	**165**	245	70	**135**	195	65	**120**	175
	6	120	**210**	305	100	**170**	245	90	**155**	220
S	1	30	**70**	105	20	**40**	60	20	**35**	55
	2	30	**65**	100	20	**35**	45	20	**30**	40
	3	30	**65**	100	20	**35**	45	20	**30**	40
	4	55	**105**	150	45	**85**	120	40	**75**	110
H	1	30	**45**	60	–	**–**	–	–	**–**	–
	2	15	**30**	45	–	**–**	–	–	**–**	–
	3	–	**–**	–	–	**–**	–	–	**–**	–
	4	–	**–**	–	–	**–**	–	–	**–**	–

NOTE: FIRST choice starting speeds are in **bold** type.

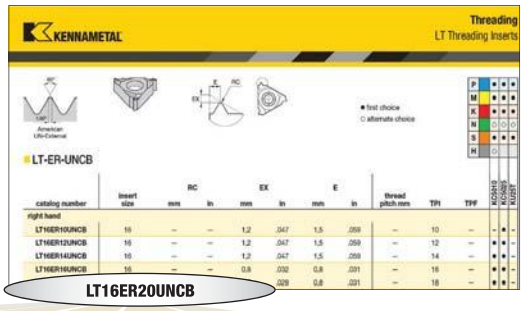
Recommended Starting Speeds [SFM]

Material Group		KC5010			KC5025			KU25T		
P	0–1	450	**650**	850	350	**550**	750	315	**495**	675
	2	430	**630**	800	330	**500**	650	300	**450**	585
	3	350	**520**	650	250	**420**	550	225	**380**	495
	4	240	**400**	520	200	**310**	420	180	**280**	380
	5	350	**520**	650	250	**420**	550	225	**380**	495
	6	240	**400**	520	160	**300**	420	145	**270**	380
M	1	400	**600**	800	300	**550**	750	270	**495**	675
	2	300	**550**	700	250	**470**	650	225	**425**	585
	3	300	**550**	700	250	**450**	650	225	**405**	585
K	1	400	**600**	800	300	**450**	600	270	**405**	540
	2	300	**500**	700	240	**400**	560	215	**360**	505
	3	200	**350**	500	160	**280**	400	145	**250**	360
N	1–2	500	**1200**	1800	400	**1000**	1500	360	**900**	1350
	3	300	**450**	600	200	**350**	500	180	**315**	450
	4	400	**1000**	1500	320	**660**	1000	290	**595**	900
	5	300	**550**	800	240	**440**	640	215	**395**	575
	6	400	**700**	1000	320	**560**	800	290	**505**	720
S	1	100	**230**	350	75	**125**	200	70	**110**	180
	2	100	**210**	320	75	**110**	150	70	**100**	135
	3	100	**210**	320	75	**110**	150	70	**100**	135
	4	180	**350**	500	150	**280**	400	135	**250**	360
H	1	100	**150**	200	–	**–**	–	–	**–**	–
	2	50	**100**	150	–	**–**	–	–	**–**	–
	3	–	**–**	–	–	**–**	–	–	**–**	–
	4	–	**–**	–	–	**–**	–	–	**–**	–

NOTE: FIRST choice starting speeds are in **bold** type.

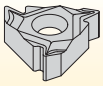
How Do Catalog Numbers Work?

Each character in our catalog number signifies a specific trait of that product. Use the following key columns and corresponding image to easily identify which attributes apply.



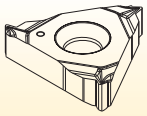
Inch

LT	16	ER	20	UN	CB
Type of Insert	Cutting Edge Length *(Size)*	Hand of Insert	Thread Pitch	Thread Profile	Chip Control



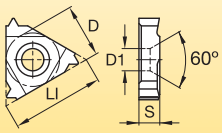
LT = Laydown triangle threading

ER = External right hand
EL = External left hand
NR = Internal right hand
NL = Internal left hand



□ = Flat top
CB = Chipbreaker
K = Kenna Universal™ chipbreaker

insert size	LI (mm)	D (inch)	D (mm)	S (inch)	S (mm)	D1 (inch)	D1 (mm)
11	11,0	.250	6,35	.126	3,20	.128	3,25
16	16,5	.375	9,52	.143	3,63	.155	3,94
22	22,0	.500	12,70	.188	4,78	.192	4,88



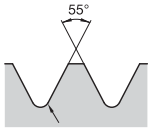
ISO = ISO metric 60°
UN = American UN 60°
60 = Partial profile non-cresting 60°
55 = Partial profile non-cresting 55°
W = Whitworth 55°
BSPT = British Standard Pipe Thread 55°
NPT = American National Pipe Thread 60°
ACME = American Acme
STACME = American Stub Acme
TR = Trapez DIN 103
RD = Round DIN 405
UNJ = Controlled root radius 60°
NPTF = Dryseal 60°
API = American Petroleum Institute Threads
BUT = API Buttress Casing
APIRD = API Round

partial profile		
designation	**thread pitch (mm)**	**TPI**
A	0,50–1,5	48–16
AG	0,50–3,0	48–8
G	1,75–3,0	14–8
N	3,50–5,0	7–5
full profile		
actual TPI or pitch in mm is designated	0,5–4,0	48–8

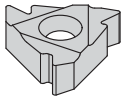
The Kennametal LT Advantage

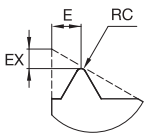
Every box of 10 inserts includes a free Torx wrench and spare locking screw, except LT-K inserts.

style			thread profile	standard	tolerance class	cresting	application	page(s)
CB	K	flat top						
 LT-60CB	 LT-60K	 LT-60	Partial profile 60°	—	—	N	General use for 60° thread forms, such as ISO and UN, where non-cresting inserts are desired to cut a variety of pitches.	D51–D52, D60–D61
 LT-ISOCB	 LT-ISOK	 LT-ISO	Metric ISO	ISO R262, DIN 13	6g/6H	Y	Widely used metric 60° V-form for all industries.	D54, D63–D64
 LT-UNCB	 LT-UNK	 LT-UN	American UN	ANSI B1.1:74	2A/2B	Y	Widely used inch-based 60° V-form for all industries.	D57–D58, D67–D68
		 LT-UNJ	UNJ	MIL-S-8879C	3A/3B	Y	Controlled root radius on external threads for military and aerospace industries, 60° thread form.	D58, D68
 LT-NPTCB		 LT-NPT	NPT	USAS B2.1:1968	Standard NPT	Y	National Pipe Thread standard 60° thread form for pipe fittings.	D55, D64–D65
 LT-NPTFCB		 LT-NPTF	NPTF	ANSI B1.20.3-1976	Class 2	Y	Dryseal-type NPT 60° thread form for pipe fittings.	D55–D56, D65
	 LT-55K	 LT-55	Partial profile 55°	—	—	N	General use for 55° thread forms such as Whitworth, BSW, and BSP where non-cresting inserts are desired to cut a variety of pitches.	D51, D60
		 LT-BSPT	BSPT	BS 21:1985	Standard BSPT	Y	55° form for pipe fittings.	D53, D62
 LT-WCB	 LT-WK	 LT-W	Whitworth, BSW, BSF, BSP	BS 84:1956, ISO 228/1:1985, DIN 259	Medium Class A	Y	Widely used 55° form for gas and water connections.	D59, D69
		 LT-API	API Rotary Shoulder Connections	API SPEC. 7:1990	Standard API	Y	60° V-form used for rotary shoulder pipe connections in the oil and gas industry including V-.038R, V-.040, and V-.050 forms.	D52, D62
		 LT-APIRD	API round	API STD. 5B:1979	Standard API RD	Y	60° V-form with large radius for casing, tubing, and line pipe in the oil and gas industry, including 8 and 10 round forms.	D53, D62
		 LT-BUT	API Buttress Casing	API SPEC. 7:1990	Standard API	Y	45° buttress-style form used for pipe casing connections in the oil and gas industry.	D53, D62
		 LT-ACME	Acme	ANSI B1.5:1988	3G	N	29° truncated thread form for motion applications in a wide variety of industries.	D52, D61
		 LT-STACME	Stub Acme	ANSI B1.8:1988	2G	N	Shallow depth 29° truncated thread form for motion applications in a wide variety of industries.	D56, D66
		 LT-RD	Round	DIN 405	7h/7H	Y	Round thread form for tube fittings in the chemical and food industries.	D56, D65
		 LT-TR	Trapez	DIN 103	7e/7H	N	30° truncated metric thread form for motion applications.	D57, D66



Partial Profile 55°
External



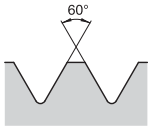


● first choice
○ alternate choice

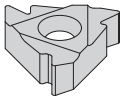
P		●	●	●
M		●	●	●
K		●	●	●
N		○	○	○
S		●	●	●
H		○		

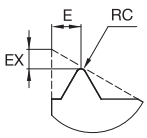
LT-ER/L-55

catalog number	insert size	RC mm	RC in	EX mm	EX in	E mm	E in	thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
right hand													
LT16ERA55	16	0,05	.0020	0,8	.031	0,89	.035	0,50-1,50	16-48	—	–	●	–
LT16ERAG55	16	0,08	.0030	1,2	.047	1,70	.067	0,50-3,00	8-48	—	●	●	–
16ERG55	16	0,20	.0080	1,2	.047	1,70	.067	1,75-3,00	8-14	—	–	●	–
LT22ERN55	22	0,43	.0170	1,7	.067	2,49	.098	3,50-5,00	5-7	—	–	●	–
left hand													
LT16ELAG55	16	0,08	.0030	1,2	.047	1,70	.067	0,50-3,00	8-48	—	–	●	–



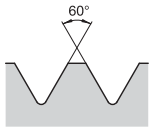
Partial Profile 60°
External



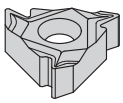


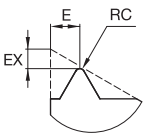
LT-ER/L-60

catalog number	insert size	RC mm	RC in	EX mm	EX in	E mm	E in	thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
right hand													
LT16ERA60	16	0,05	.002	0,8	.031	0,9	.035	0,50-1,50	16-48	—	●	●	–
LT16ERAG60	16	0,08	.003	1,2	.047	1,7	.067	0,50-3,0	8-48	—	●	–	–
16ERAG60	16	0,08	.003	1,2	.047	1,7	.067	0,50-3,0	8-48	—	–	●	–
LT16ERG60	16	0,28	.011	1,2	.047	1,7	.067	1,75-3,0	8-14	—	●	●	–
LT22ERN60	22	0,53	.021	1,7	.067	2,5	.098	3,5-5,0	5-7	—	–	●	–
left hand													
LT16ELA60	16	0,05	.002	0,8	.031	0,9	.035	0,50-1,50	16-48	—	–	●	–
LT16ELAG60	16	0,08	.003	1,2	.047	1,7	.067	0,50-3,0	8-48	—	–	●	–
LT16ELG60	16	0,28	.011	1,2	.047	1,7	.067	1,75-3,0	8-14	—	–	●	–
LT22ELN60	22	0,53	.021	1,7	.067	2,5	.098	3,5-5,0	5-7	—	–	●	–



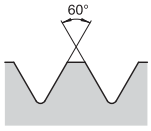
Partial Profile 60°
External



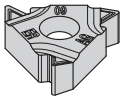


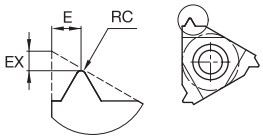
LT-ER-60CB

catalog number	insert size	RC mm	RC in	EX mm	EX in	E mm	E in	thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
right hand													
LT16ERAG60CB	16	0,08	.003	0,9	.035	1,5	.059	0,50-3,0	8-48	—	●	●	–



Partial Profile 60° External



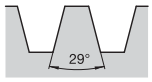


● first choice
○ alternate choice

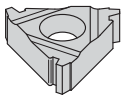
P		●	●	●
M		●	●	●
K		●	●	●
N		○	○	○
S		●	●	●
H		○		

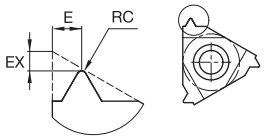
LT-ER-60K

catalog number	insert size	RC mm	RC in	EX mm	EX in	E mm	E in	thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
right hand													
LT16ERAG60K	16	0,08	.003	1,2	.047	1,7	.067	0,50-3,0	8-48	–	–	–	●



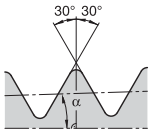
Acme External



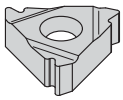


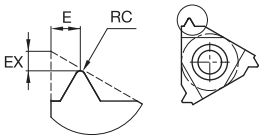
LT-ER/L-ACME

catalog number	insert size	RC mm	RC in	EX mm	EX in	E mm	E in	thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
right hand													
LT16ER10ACME	16	–	–	1,3	.051	1,40	.055	–	10	–	–	●	–
LT16ER12ACME	16	–	–	1,1	.043	1,19	.047	–	12	–	–	●	–
LT16ER16ACME	16	–	–	1,0	.039	1,09	.043	–	16	–	–	●	–
LT16ER8ACME	16	–	–	1,4	.055	1,50	.059	–	8	–	–	●	–
LT22ER5ACME	22	–	–	2,0	.079	2,29	.090	–	5	–	–	●	–
LT22ER6ACME	22	–	–	1,8	.071	2,11	.083	–	6	–	–	●	–



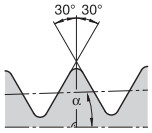
API Rotary Shoulder Connections- External
α = 1/2 arctan (TPF/12)



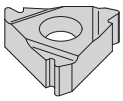


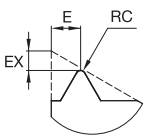
LT-ER/L-API

catalog number	insert size	RC mm	RC in	EX mm	EX in	E mm	E in	thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
right hand													
LT22ER4API382	22	–	–	2,1	.083	2,79	.110	–	4	2.0000	–	●	–
LT22ER4API502	22	–	–	2,0	.079	2,90	.114	–	4	2.0000	●	●	–
LT22ER4API503	22	–	–	2,0	.079	2,90	.114	–	4	3.0000	●	–	–
LT22ER5API403	22	–	–	1,8	.071	2,60	.102	–	5	3.0000	●	–	–
LT27ER4API502	28	0,64	.0250	2,0	.080	2,79	.110	–	4	–	–	●	–
LT27ER4API382	28	0,97	.0380	2,0	.080	2,79	.110	–	4	–	–	●	–



API Round-External



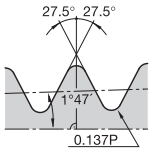


● first choice
○ alternate choice

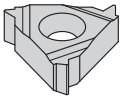
P		●	●	●
M		●	●	●
K		●	●	●
N		○	○	○
S		●	●	●
H		○		

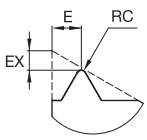
LT-ER/L-APIRD

catalog number	insert size	RC mm	RC in	EX mm	EX in	E mm	E in	thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
right hand													
LT16ER10APIRD	16	–	–	1,2	.047	1,40	.055	–	10	.7500	–	●	–
LT16ER8APIRD	16	–	–	1,3	.051	1,50	.059	–	8	.7500	–	●	–
left hand													
LT16EL8APIRD	16	–	–	1,3	.051	1,50	.059	–	8	.7500	–	●	–



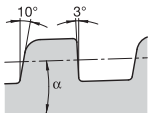
BSPT-External



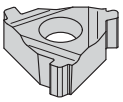


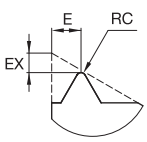
LT-ER/L-BSPT

catalog number	insert size	RC mm	RC in	EX mm	EX in	E mm	E in	thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
right hand													
LT16ER11BSPT	16	–	–	1,1	.043	1,50	.059	–	11	.7500	–	●	–
LT16ER14BSPT	16	–	–	1,0	.039	1,19	.047	–	14	.7500	–	●	–



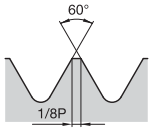
API Buttress
Casing-External
α = 1/2 arctan
(TPF/12)



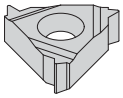


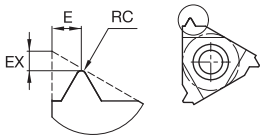
LT-ER/L-BUT

catalog number	insert size	RC mm	RC in	EX mm	EX in	E mm	E in	thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
right hand													
LT22ER5BUT75	22	–	–	3,1	.122	1,91	.075	–	5	.7500	–	●	–



ISO Metric-External



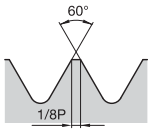


● first choice
○ alternate choice

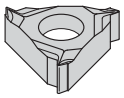
P	●	●	●
M	●	●	●
K	●	●	●
N	○	○	○
S	●	●	●
H	○		

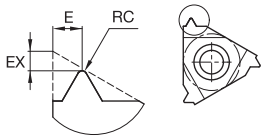
LT-ER/L-ISO

catalog number	insert size	RC mm	RC in	EX mm	EX in	E mm	E in	thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
right hand													
LT16ER05ISO	16	–	–	0,6	.024	0,4	.016	0,50	–	–	–	●	–
LT16ER075ISO	16	–	–	0,6	.024	0,6	.024	0,75	–	–	–	●	–
LT16ER10ISO	16	–	–	0,7	.027	0,7	.027	1,0	–	–	●	●	–
LT16ER125ISO	16	–	–	0,8	.031	0,9	.035	1,25	–	–	●	●	–
LT16ER15ISO	16	–	–	0,8	.031	1,0	.039	1,5	–	–	●	●	–
LT16ER175ISO	16	–	–	0,9	.035	1,2	.047	1,75	–	–	●	●	–
LT16ER20ISO	16	–	–	1,0	.039	1,3	.051	2,0	–	–	●	●	–
LT16ER25ISO	16	–	–	1,1	.043	1,5	.059	2,5	–	–	●	●	–
LT16ER30ISO	16	–	–	1,2	.047	1,6	.063	3,0	–	–	●	●	–
LT22ER35ISO	22	–	–	1,6	.063	2,3	.090	3,5	–	–	–	●	–
LT22ER40ISO	22	–	–	1,6	.063	2,3	.090	4,0	–	–	–	●	–
LT22ER45ISO	22	–	–	1,7	.067	2,4	.094	4,5	–	–	–	●	–
LT22ER50ISO	22	–	–	1,7	.067	2,5	.098	5,0	–	–	–	●	–
left hand													
LT16EL15ISO	16	–	–	0,8	.031	1,0	.039	1,5	–	–	●	●	–
LT16EL175ISO	16	–	–	0,9	.035	1,2	.047	1,75	–	–	–	●	–
LT16EL20ISO	16	–	–	1,0	.039	1,3	.051	2,0	–	–	–	●	–
LT16EL25ISO	16	–	–	1,1	.043	1,5	.059	2,5	–	–	–	●	–
LT16EL30ISO	16	–	–	1,2	.047	1,6	.063	3,0	–	–	–	●	–
LT16EL05ISO	16	–	–	0,6	.024	0,4	.016	0,50	–	–	–	●	–
LT16EL075ISO	16	–	–	0,6	.024	0,6	.024	0,75	–	–	–	●	–
LT16EL10ISO	16	–	–	0,7	.027	0,7	.027	1,0	–	–	–	●	–
LT16EL125ISO	16	–	–	0,8	.031	0,9	.035	1,25	–	–	–	●	–
LT22EL35ISO	22	–	–	1,6	.063	2,3	.090	3,5	–	–	–	●	–



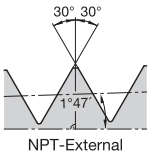
ISO Metric-External



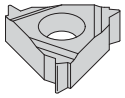


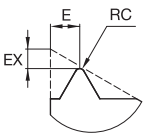
LT-ER-ISOCB

catalog number	insert size	RC mm	RC in	EX mm	EX in	E mm	E in	thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
right hand													
LT16ER05ISOCB	16	–	–	1,2	.047	0,5	.020	0,50	–	–	●	●	–
LT16ER075ISOCB	16	–	–	1,2	.047	0,6	.024	0,75	–	–	●	●	–
LT16ER10ISOCB	16	–	–	0,7	.028	0,8	.031	1,0	–	–	●	●	–
LT16ER125ISOCB	16	–	–	0,7	.028	0,8	.031	1,25	–	–	●	●	–
LT16ER15ISOCB	16	–	–	0,7	.028	0,8	.031	1,5	–	–	●	●	–
LT16ER175ISOCB	16	–	–	1,2	.047	1,5	.059	1,75	–	–	●	●	–
LT16ER20ISOCB	16	–	–	1,2	.047	1,5	.059	2,0	–	–	●	●	–
LT16ER25ISOCB	16	–	–	1,2	.047	1,5	.059	2,5	–	–	–	●	–
LT16ER30ISOCB	16	–	–	1,3	.051	1,5	.059	3,0	–	–	●	●	–



NPT-External



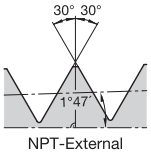


● first choice
○ alternate choice

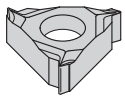
P		●	●	●
M		●	●	●
K		●	●	●
N		○	○	○
S		●	●	●
H		○		

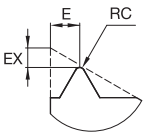
LT-ER/L-NPT

catalog number	insert size	RC mm	RC in	EX mm	EX in	E mm	E in	thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
right hand													
LT16ER115NPT	16	–	–	1,1	.043	1,5	.059	–	11.5	.7500	●	●	–
LT16ER14NPT	16	–	–	0,9	.035	1,2	.047	–	14	.7500	●	●	–
LT16ER18NPT	16	–	–	0,8	.031	1,0	.039	–	18	.7500	●	●	–
LT16ER27NPT	16	–	–	0,7	.027	0,8	.031	–	27	.7500	–	●	–
LT16ER8NPT	16	–	–	1,3	.051	1,8	.071	–	8	.7500	–	●	–



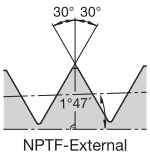
NPT-External



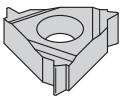


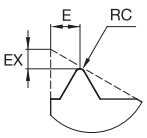
LT-ER-NPTCB

catalog number	insert size	RC mm	RC in	EX mm	EX in	E mm	E in	thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
right hand													
LT16ER14NPTCB	16	–	–	1,1	.043	1,5	.059	–	14	.7500	●	●	–



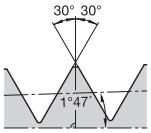
NPTF-External



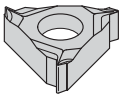


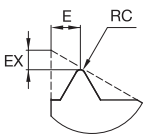
LT-ER/L-NPTF

catalog number	insert size	RC mm	RC in	EX mm	EX in	E mm	E in	thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
right hand													
LT16ER115NPTF	16	–	–	1,1	.043	1,5	.059	–	11.5	.7500	–	●	–
LT16ER14NPTF	16	–	–	0,9	.035	1,2	.047	–	14	.7500	–	●	–



NPTF-External



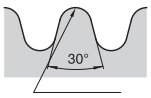


● first choice
○ alternate choice

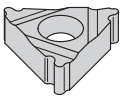
P		●	●	●
M		●	●	●
K		●	●	●
N		○	○	○
S		●	●	●
H		○		

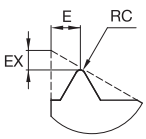
LT-ER-NPTFCB

catalog number	insert size	RC mm	RC in	EX mm	EX in	E mm	E in	thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
right hand													
LT16ER115NPTFCB	16	–	–	1,1	.043	1,5	.059	–	11.5	.7500	–	●	–



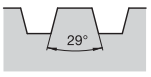
Round External



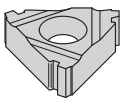


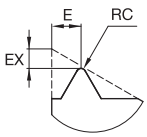
LT-ER/L-RD

catalog number	insert size	RC mm	RC in	EX mm	EX in	E mm	E in	thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
right hand													
LT16ER8RD	16	0,76	.0298	1,4	.055	1,30	.051	–	8	–	–	●	–
LT22ER6RD	22	1,01	.0398	1,5	.059	1,70	.067	–	6	–	–	●	–



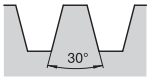
Stub Acme-External



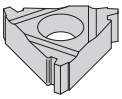


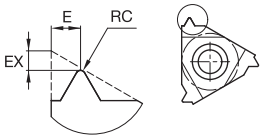
LT-ER/L-STACME

catalog number	insert size	RC mm	RC in	EX mm	EX in	E mm	E in	thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
right hand													
LT16ER10STACME	16	–	–	1,2	.047	1,30	.051	–	10	–	–	●	–
LT16ER12STACME	16	–	–	1,2	.047	1,19	.047	–	12	–	–	●	–
LT16ER16STACME	16	–	–	1,0	.039	0,99	.039	–	16	–	–	●	–
LT16ER6STACME	16	–	–	1,7	.067	1,80	.071	–	6	–	–	●	–
LT16ER8STACME	16	–	–	1,4	.055	1,50	.059	–	8	–	–	●	–
LT22ER5STACME	22	–	–	2,1	.083	2,29	.090	–	5	–	–	●	–



Trapez-External



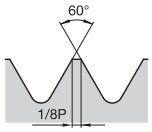


● first choice
○ alternate choice

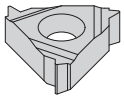
P	●	●	●
M	●	●	●
K	●	●	●
N	○	○	○
S	●	●	●
H	○		

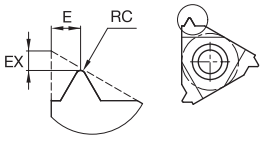
LT-ER/L-TR

catalog number	insert size	RC mm	RC in	EX mm	EX in	E mm	E in	thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
right hand													
LT16ER2TR	16	–	–	1,1	.043	1,30	.051	2,0	–	–	–	●	–
LT16ER3TR	16	–	–	1,3	.051	1,50	.059	3,0	–	–	–	●	–
LT22ER4TR	22	–	–	1,7	.067	1,91	.075	4,0	–	–	–	●	–
LT22ER5TR	22	–	–	2,1	.083	2,50	.098	5,0	–	–	–	●	–



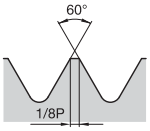
American
UN-External



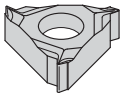


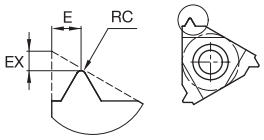
LT-ER/L-UN

catalog number	insert size	RC mm	RC in	EX mm	EX in	E mm	E in	thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
right hand													
LT16ER10UN	16	–	–	1,1	.043	1,5	.059	–	10	–	–	●	–
LT16ER12UN	16	–	–	1,1	.043	1,4	.055	–	12	–	●	●	–
LT16ER14UN	16	–	–	1,0	.039	1,2	.047	–	14	–	●	●	–
LT16ER16UN	16	–	–	0,9	.035	1,1	.043	–	16	–	●	●	–
LT16ER18UN	16	–	–	0,8	.031	1,0	.039	–	18	–	●	●	–
LT16ER20UN	16	–	–	0,8	.031	0,9	.035	–	20	–	●	●	–
LT16ER24UN	16	–	–	0,7	.027	0,8	.031	–	24	–	●	●	–
LT16ER28UN	16	–	–	0,6	.024	0,7	.027	–	28	–	●	●	–
LT16ER32UN	16	–	–	0,6	.024	0,6	.024	–	32	–	●	●	–
LT16ER36UN	16	–	–	0,6	.024	0,6	.024	–	36	–	–	●	–
LT16ER40UN	16	–	–	0,6	.024	0,6	.024	–	40	–	–	●	–
LT16ER48UN	16	–	–	0,6	.024	0,6	.024	–	48	–	–	●	–
LT16ER8UN	16	–	–	1,2	.047	1,6	.063	–	8	–	–	●	–
left hand													
LT16EL24UN	16	–	–	0,7	.027	0,8	.031	–	24	–	–	●	–
LT16EL28UN	16	–	–	0,6	.024	0,7	.027	–	28	–	–	●	–
LT16EL8UN	16	–	–	1,2	.047	1,6	.063	–	8	–	–	●	–
LT16EL12UN	16	–	–	1,1	.043	1,4	.055	–	12	–	–	●	–
LT16EL14UN	16	–	–	1,0	.039	1,2	.047	–	14	–	–	●	–
LT16EL16UN	16	–	–	0,9	.035	1,1	.043	–	16	–	–	●	–
LT16EL18UN	16	–	–	0,8	.031	1,0	.039	–	18	–	–	●	–
LT16EL20UN	16	–	–	0,8	.031	0,9	.035	–	20	–	–	●	–



American
UN-External





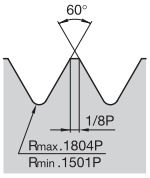
● first choice
○ alternate choice

		KC5010	KC5025	KU25T
P		●	●	●
M		●	●	●
K		●	●	●
N		○	○	○
S		●	●	●
H		○		

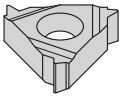
Threading

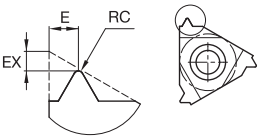
LT-ER-UNCB

catalog number	insert size	RC mm	RC in	EX mm	EX in	E mm	E in	thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
right hand													
LT16ER10UNCB	16	–	–	1,2	.047	1,5	.059	–	10	–	–	●	–
LT16ER12UNCB	16	–	–	1,2	.047	1,5	.059	–	12	–	●	●	–
LT16ER14UNCB	16	–	–	1,2	.047	1,5	.059	–	14	–	●	●	–
LT16ER16UNCB	16	–	–	0,8	.032	0,8	.031	–	16	–	●	●	–
LT16ER18UNCB	16	–	–	0,7	.028	0,8	.031	–	18	–	●	●	–
LT16ER20UNCB	16	–	–	0,7	.028	0,8	.031	–	20	–	●	●	–
LT16ER24UNCB	16	–	–	0,7	.028	0,8	.031	–	24	–	●	●	–
LT16ER28UNCB	16	–	–	0,7	.028	0,8	.031	–	28	–	●	●	–
LT16ER32UNCB	16	–	–	1,2	.047	0,5	.020	–	32	–	●	●	–
LT16ER8UNCB	16	–	–	1,3	.051	1,5	.059	–	8	–	●	●	–



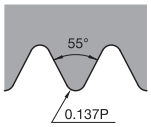
UNJ-External



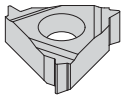


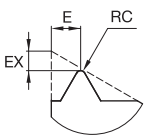
LT-ER/L-UNJ

catalog number	insert size	RC mm	RC in	EX mm	EX in	E mm	E in	thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
right hand													
LT16ER12UNJ	16	–	–	1,1	.043	1,3	.051	–	12	–	●	●	–
LT16ER14UNJ	16	–	–	1,0	.039	1,2	.047	–	14	–	●	●	–
LT16ER16UNJ	16	–	–	0,9	.035	1,1	.043	–	16	–	●	●	–
LT16ER18UNJ	16	–	–	0,8	.031	1,0	.039	–	18	–	●	●	–
LT16ER20UNJ	16	–	–	0,8	.031	0,9	.035	–	20	–	●	●	–
LT16ER24UNJ	16	–	–	0,7	.027	0,8	.031	–	24	–	–	●	–
LT16ER28UNJ	16	–	–	0,7	.027	0,7	.027	–	28	–	–	●	–
LT16ER32UNJ	16	–	–	0,6	.024	0,7	.027	–	32	–	–	●	–
left hand													
LT16EL16UNJ	16	–	–	0,9	.035	1,1	.043	–	16	–	–	●	–



Whitworth BSW,
BSF, BSP-Internal



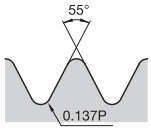


● first choice
○ alternate choice

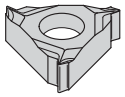
P		●	●	●
M		●	●	●
K		●	●	●
N		○	○	○
S		●	●	●
H		○		

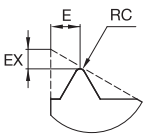
LT-ER/L-W

catalog number	insert size	RC mm	RC in	EX mm	EX in	E mm	E in	thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
right hand													
LT16ER10W	16	–	–	1,1	.043	1,50	.059	–	10	–	–	●	–
LT16ER11W	16	–	–	1,1	.043	1,50	.059	–	11	–	●	●	–
LT16ER12W	16	–	–	1,1	.043	1,40	.055	–	12	–	–	●	–
LT16ER14W	16	–	–	1,0	.039	1,19	.047	–	14	–	●	●	–
LT16ER16W	16	–	–	0,9	.035	1,09	.043	–	16	–	–	●	–
LT16ER18W	16	–	–	0,8	.031	0,99	.039	–	18	–	–	●	–
LT16ER19W	16	–	–	0,8	.031	0,99	.039	–	19	–	●	●	–
LT16ER20W	16	–	–	0,8	.031	0,89	.035	–	20	–	–	●	–
LT16ER24W	16	–	–	0,7	.028	0,79	.031	–	24	–	–	●	–
LT16ER28W	16	–	–	0,6	.024	0,69	.027	–	28	–	–	●	–
LT16ER8W	16	–	–	1,2	.047	1,50	.059	–	8	–	–	●	–
LT16ER9W	16	–	–	1,2	.047	1,70	.067	–	9	–	–	●	–
LT22ER6W	22	–	–	1,6	.063	2,29	.090	–	6	–	–	●	–
LT22ER7W	22	–	–	1,6	.063	2,29	.090	–	7	–	–	●	–
left hand													
LT16EL11W	16	–	–	1,1	.043	1,50	.059	–	11	–	–	●	–
LT16EL14W	16	–	–	1,0	.039	1,19	.047	–	14	–	–	●	–



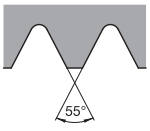
Whitworth BSW,
BSF, BSP-External



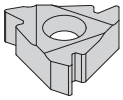


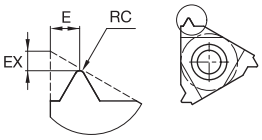
LT-ER-WCB

catalog number	insert size	RC mm	RC in	EX mm	EX in	E mm	E in	thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
right hand													
LT16ER11WCB	16	–	–	1,3	.051	1,50	.059	–	11	–	–	●	–
LT16ER14WCB	16	–	–	1,3	.051	1,50	.059	–	14	–	●	●	–



Partial Profile 55°
Internal



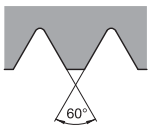


● first choice
○ alternate choice

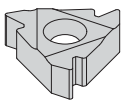
P		●	●	●
M		●	●	●
K		●	●	●
N		○	○	○
S		●	●	●
H		○		

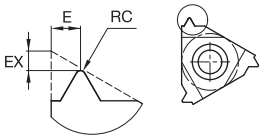
LT-NR/L-55

catalog number	insert size	RC mm	RC in	EX mm	EX in	E mm	E in	thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
right hand													
LT11NRA55	11	0,05	.0020	0,8	.031	0,89	.035	0,50-1,50	16-48	–	–	●	–
LT16NRA55	16	0,05	.0020	0,8	.031	0,89	.035	0,50-1,50	16-48	–	–	●	–
LT16NRAG55	16	0,07	.0028	1,2	.047	1,70	.067	0,50-3,00	8-48	–	–	●	–
LT16NRG55	16	0,21	.0083	1,2	.047	1,70	.067	1,75-3,00	8-14	–	–	●	–
LT22NRN55	22	0,43	.0170	1,7	.067	2,49	.098	3,50-5,00	5-7	–	–	●	–



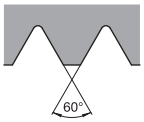
Partial Profile 60°
Internal

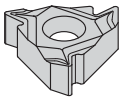




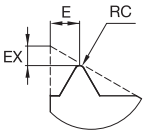
LT-NR/L-60

catalog number	insert size	RC mm	RC in	EX mm	EX in	E mm	E in	thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
right hand													
LT11NRA60	11	0,05	.002	0,8	.031	0,9	.035	0,50-1,50	48-16	–	●	●	–
LT16NRA60	16	0,05	.002	0,8	.031	0,9	.035	0,50-1,50	48-16	–	●	●	–
LT16NRAG60	16	0,05	.002	1,2	.047	1,7	.067	0,50-3,0	48-8	–	●	●	–
LT16NRG60	16	0,15	.006	1,2	.047	1,7	.067	1,75-3,0	14-8	–	●	●	–
LT22NRN60	22	0,31	.012	1,7	.067	2,5	.098	3,5-5,0	7-5	–	–	●	–
left hand													
LT11NLA60	11	0,05	.002	0,8	.031	0,9	.035	0,50-1,50	48-16	–	–	●	–
LT16NLA60	16	0,05	.002	0,8	.031	0,9	.035	0,50-1,50	48-16	–	–	●	–
LT16NLAG60	16	0,05	.002	1,2	.047	1,7	.067	0,50-3,0	48-8	–	–	●	–
LT16NLG60	16	0,15	.006	1,2	.047	1,7	.067	1,75-3,0	14-8	–	–	●	–
LT22NLN60	22	0,31	.012	1,7	.067	2,5	.098	3,5-5,0	7-5	–	–	●	–





Partial Profile 60°
Internal

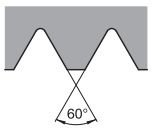


● first choice
○ alternate choice

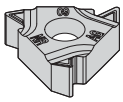
P		●	●	●
M		●	●	●
K		●	●	●
N		○	○	○
S		●	●	●
H		○		

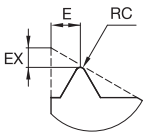
LT-NR-60CB

catalog number	insert size	RC mm	RC in	EX mm	EX in	E mm	E in	thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
right hand													
LT11NRA60CB	11	0,05	.002	0,6	.024	0,8	.031	0,50-1,50	48-16	–	–	●	–
LT16NRAG60CB	16	0,05	.002	0,9	.035	1,5	.059	0,50-3,0	48-8	–	–	●	–
LT16NRG60CB	16	0,16	.006	1,0	.039	1,5	.059	1,75-3,0	14-8	–	–	●	–



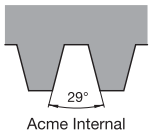
Partial Profile 60°
Internal



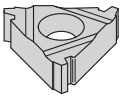


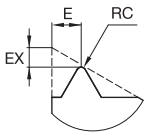
LT-NR-60K

catalog number	insert size	RC mm	RC in	EX mm	EX in	E mm	E in	thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
right hand													
LT16NRAG60K	16	0,04	.002	1,2	.047	1,7	.067	0,50-3,0	48-8	–	–	–	●



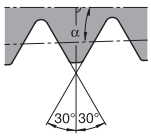
Acme Internal



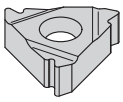


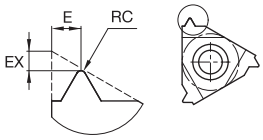
LT-NR/L-ACME

catalog number	insert size	RC mm	RC in	EX mm	EX in	E mm	E in	thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
right hand													
LT16NR10ACME	16	–	–	1,2	.047	1,30	.051	–	10	–	–	●	–
LT16NR12ACME	16	–	–	1,2	.047	1,30	.051	–	12	–	–	●	–
LT16NR8ACME	16	–	–	1,4	.055	1,50	.059	–	8	–	–	●	–
LT22NR5ACME	22	–	–	2,0	.079	2,29	.090	–	5	–	–	●	–
LT22NR6ACME	22	–	–	1,8	.071	2,11	.083	–	6	–	–	●	–



API Rotary Shoulder Connections-Internal
α = 1/2 arctan (TPF/12)



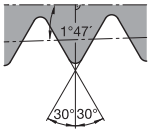


● first choice
○ alternate choice

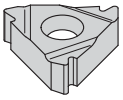
P		●	●	●
M		●	●	●
K		●	●	●
N		○	○	○
S		●	●	●
H		○		

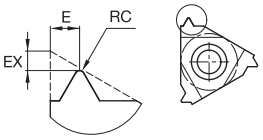
LT-NR/L-API

catalog number	insert size	RC mm	RC in	EX mm	EX in	E mm	E in	thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
right hand													
LT22NR4API382	22	–	–	2,1	.083	2,79	.110	–	4	2.0000	–	●	–
LT22NR4API502	22	–	–	2,1	.083	3,10	.122	–	4	2.0000	–	●	–
LT22NR5API403	22	–	–	1,8	.071	2,60	.102	–	5	3.0000	–	●	–
LT27NR4API502	28	0,65	.0260	2,0	.080	3,79	.110	–	4	–	–	●	–
LT27NR4API382	28	0,99	.0390	2,0	.080	2,79	.110	–	4	–	–	●	–



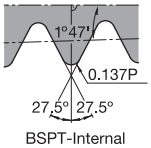
API Round-Internal



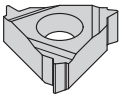


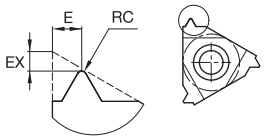
LT-NR/L-APIRD

catalog number	insert size	RC mm	RC in	EX mm	EX in	E mm	E in	thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
right hand													
LT16NR10APIRD	16	–	–	1,2	.047	1,40	.055	–	10	.7500	–	●	–
LT16NR8APIRD	16	–	–	1,3	.051	1,50	.059	–	8	.7500	–	●	–



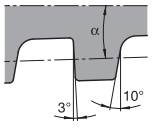
BSPT-Internal



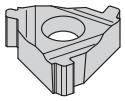


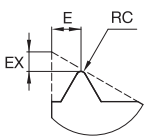
LT-NR/L-BSPT

catalog number	insert size	RC mm	RC in	EX mm	EX in	E mm	E in	thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
right hand													
LT11NR14BSPT	11	–	–	0,9	.035	0,99	.039	–	14	.7500	–	●	–
LT16NR11BSPT	16	–	–	1,1	.043	1,50	.059	–	11	.7500	–	●	–
LT16NR14BSPT	16	–	–	1,0	.039	1,19	.047	–	14	.7500	–	●	–



API Buttress
Casing-Internal
α = 1/2 arctan
(TPF/12)



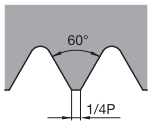


● first choice
○ alternate choice

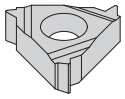
P		●	●	●
M		●	●	●
K		●	●	●
N		○	○	○
S		●	●	●
H		○		

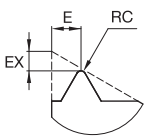
LT-NR/L-BUT

catalog number	insert size	RC mm	RC in	EX mm	EX in	E mm	E in	thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
right hand													
LT22NR5BUT1	22	–	–	2,8	.110	1,91	.075	–	5	1.0000	–	●	–
LT22NR5BUT75	22	–	–	2,8	.110	1,91	.075	–	5	.7500	–	●	–



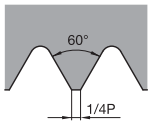
ISO Metric-Internal



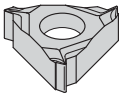


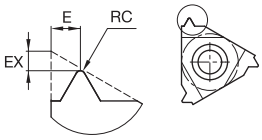
LT-NR/L-ISO

catalog number	insert size	RC mm	RC in	EX mm	EX in	E mm	E in	thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
right hand													
LT11NR05ISO	11	–	–	0,6	.024	0,4	.016	0,50	–	–	–	●	–
LT11NR075ISO	11	–	–	0,6	.024	0,6	.024	0,75	–	–	–	●	–
LT11NR10ISO	11	–	–	0,6	.024	0,7	.027	1,0	–	–	–	●	–
LT11NR125ISO	11	–	–	0,8	.031	0,9	.035	1,25	–	–	–	●	–
LT11NR15ISO	11	–	–	0,8	.031	1,0	.039	1,5	–	–	●	●	–
LT11NR175ISO	11	–	–	0,9	.035	1,1	.043	1,75	–	–	–	●	–
LT11NR20ISO	11	–	–	0,9	.035	1,1	.043	2,0	–	–	–	●	–
LT16NR05ISO	16	–	–	0,6	.024	0,4	.016	0,50	–	–	–	●	–
LT16NR075ISO	16	–	–	0,6	.024	0,6	.024	0,75	–	–	–	●	–
LT16NR10ISO	16	–	–	0,6	.024	0,7	.027	1,0	–	–	●	●	–
LT16NR125ISO	16	–	–	0,8	.031	0,9	.035	1,25	–	–	–	●	–
LT16NR15ISO	16	–	–	0,8	.031	1,0	.039	1,5	–	–	●	●	–
LT16NR175ISO	16	–	–	0,9	.035	1,2	.047	1,75	–	–	–	●	–
LT16NR20ISO	16	–	–	1,0	.039	1,3	.051	2,0	–	–	●	●	–
LT16NR25ISO	16	–	–	1,1	.043	1,5	.059	2,5	–	–	–	●	–
LT16NR30ISO	16	–	–	1,1	.043	1,5	.059	3,0	–	–	●	●	–
LT22NR35ISO	22	–	–	1,6	.063	2,3	.090	3,5	–	–	–	●	–
LT22NR40ISO	22	–	–	1,6	.063	2,3	.090	4,0	–	–	–	●	–
LT22NR45ISO	22	–	–	1,6	.063	2,4	.094	4,5	–	–	–	●	–
LT22NR50ISO	22	–	–	1,6	.063	2,3	.090	5,0	–	–	–	●	–
left hand													
LT11NL15ISO	11	–	–	0,8	.031	1,0	.039	1,5	–	–	–	●	–
LT11NL10ISO	11	–	–	0,6	.024	0,7	.027	1,0	–	–	–	●	–
LT16NL30ISO	16	–	–	1,1	.043	1,5	.059	3,0	–	–	–	●	–
LT16NL10ISO	16	–	–	0,6	.024	0,7	.027	1,0	–	–	–	●	–
LT16NL15ISO	16	–	–	0,8	.031	1,0	.039	1,5	–	–	–	●	–
LT16NL20ISO	16	–	–	1,0	.039	1,3	.051	2,0	–	–	–	●	–
LT16NL25ISO	16	–	–	1,1	.043	1,5	.059	2,5	–	–	–	●	–



ISO Metric-Internal



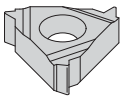


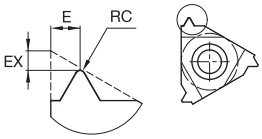
● first choice
○ alternate choice

P		●	●	●
M		●	●	●
K		●	●	●
N		○	○	○
S		●	●	●
H		○		

LT-NR-ISOCB

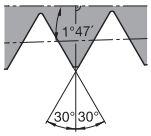
catalog number	insert size	RC mm	RC in	EX mm	EX in	E mm	E in	thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
right hand													
LT11NR075ISOCB	11	–	–	1,2	.047	0,5	.020	0,75	–	–	–	●	–
LT11NR10ISOCB	11	–	–	0,7	.028	0,8	.031	1,0	–	–	–	●	–
LT11NR125ISOCB	11	–	–	0,7	.028	0,8	.031	1,25	–	–	–	●	–
LT11NR15ISOCB	11	–	–	0,7	.028	0,8	.031	1,5	–	–	–	●	–
LT16NR10ISOCB	16	–	–	0,7	.028	0,8	.031	1,0	–	–	–	●	–
LT16NR15ISOCB	16	–	–	0,7	.028	0,8	.031	1,5	–	–	–	●	–
LT16NR20ISOCB	16	–	–	1,1	.043	1,5	.059	2,0	–	–	–	●	–
LT16NR25ISOCB	16	–	–	1,1	.043	1,5	.059	2,5	–	–	–	●	–



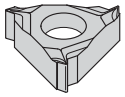


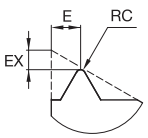
LT-NR/L-NPT

catalog number	insert size	RC mm	RC in	EX mm	EX in	E mm	E in	thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
right hand													
LT11NR14NPT	11	–	–	0,8	.031	1,0	.039	–	14	.7500	●	●	–
LT11NR18NPT	11	–	–	0,8	.031	1,0	.039	–	18	.7500	–	●	–
LT16NR115NPT	16	–	–	1,1	.043	1,5	.059	–	11.5	.7500	●	●	–
LT16NR14NPT	16	–	–	0,9	.035	1,2	.047	–	14	.7500	–	●	–
LT16NR8NPT	16	–	–	1,3	.051	1,8	.071	–	8	.7500	–	●	–



NPT-Internal



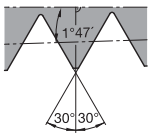


● first choice
○ alternate choice

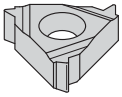
P		●	●	●
M		●	●	●
K		●	●	●
N		○	○	○
S		●	●	●
H		○		

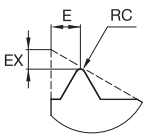
LT-NR-NPTCB

catalog number	insert size	RC mm	RC in	EX mm	EX in	E mm	E in	thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
right hand													
LT16NR115NPTCB	16	–	–	1,1	.043	1,5	.059	–	11.5	.7500	–	●	–
LT16NR14NPTCB	16	–	–	1,4	.053	1,2	.047	–	14	.7500	–	●	–



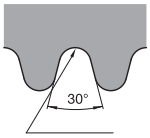
NPTF-Internal



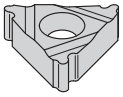


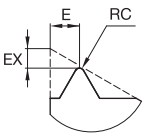
LT-NR/L-NPTF

catalog number	insert size	RC mm	RC in	EX mm	EX in	E mm	E in	thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
right hand													
LT11NR14NPTF	11	–	–	0,8	.031	0,99	.039	–	14	.7500	–	●	–
LT16NR14NPTF	16	–	–	0,9	.035	1,19	.047	–	14	.7500	–	●	–



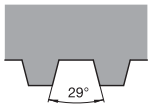
Round-Internal



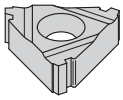


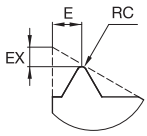
LT-NR/L-RD

catalog number	insert size	RC mm	RC in	EX mm	EX in	E mm	E in	thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
right hand													
LT16NR8RD	16	0,70	.0276	1,4	.055	1,40	.055	–	8	–	–	●	–
LT22NR6RD	22	0,93	.0368	1,5	.059	1,70	.067	–	6	–	–	●	–



Stub Acme-Internal





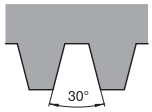
● first choice
○ alternate choice

P		●	●	●
M		●	●	●
K		●	●	●
N		○	○	○
S		●	●	●
H		○		

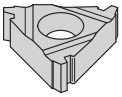
Threading

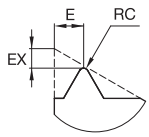
LT-NR/L-STACME

catalog number	insert size	RC mm	RC in	EX mm	EX in	E mm	E in	thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
right hand													
LT16NR10STACME	16	–	–	1,2	.047	1,30	.051	–	10	–	–	●	–
LT16NR12STACME	16	–	–	1,1	.043	1,19	.047	–	12	–	–	●	–
LT16NR14STACME	16	–	–	1,1	.043	1,09	.043	–	14	–	–	●	–
LT16NR16STACME	16	–	–	1,0	.039	0,99	.039	–	16	–	–	●	–
LT16NR6STACME	16	–	–	1,7	.067	1,80	.071	–	6	–	–	●	–
LT16NR8STACME	16	–	–	1,4	.055	1,50	.059	–	8	–	–	●	–



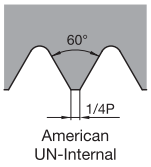
Trapez-Internal



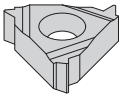


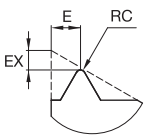
LT-NR/L-TR

catalog number	insert size	RC mm	RC in	EX mm	EX in	E mm	E in	thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
right hand													
LT16NR2TR	16	–	–	1,1	.043	1,30	.051	2,0	–	–	–	●	–
LT16NR3TR	16	–	–	1,3	.051	1,50	.059	3,0	–	–	–	●	–
LT22NR4TR	22	–	–	1,7	.067	1,91	.075	4,0	–	–	–	●	–
LT22NR5TR	22	–	–	2,1	.083	2,50	.098	5,0	–	–	–	●	–



American
UN-Internal



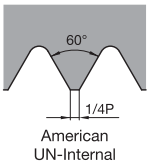


● first choice
○ alternate choice

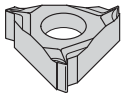
P	●	●	●	
M	●	●	●	
K	●	●	●	
N	○	○	○	
S	●	●	●	
H	○			

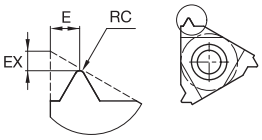
LT-NR/L-UN

catalog number	insert size	RC mm	RC in	EX mm	EX in	E mm	E in	thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
right hand													
LT11NR16UN	11	–	–	0,9	.035	1,1	.043	–	16	–	●	●	–
LT11NR18UN	11	–	–	0,8	.031	1,0	.039	–	18	–	–	●	–
LT11NR20UN	11	–	–	0,8	.031	0,9	.035	–	20	–	–	●	–
LT11NR24UN	11	–	–	0,7	.027	0,8	.031	–	24	–	–	●	–
LT11NR28UN	11	–	–	0,6	.024	0,7	.027	–	28	–	–	●	–
LT11NR32UN	11	–	–	0,6	.024	0,6	.024	–	32	–	–	●	–
LT11NR40UN	11	–	–	0,6	.024	0,6	.024	–	40	–	–	●	–
LT16NR10UN	16	–	–	1,1	.043	1,5	.059	–	10	–	–	●	–
LT16NR12UN	16	–	–	1,1	.043	1,4	.055	–	12	–	●	●	–
LT16NR14UN	16	–	–	0,9	.035	1,2	.047	–	14	–	–	●	–
LT16NR16UN	16	–	–	0,9	.035	1,1	.043	–	16	–	–	●	–
LT16NR18UN	16	–	–	0,8	.031	1,0	.039	–	18	–	–	●	–
LT16NR20UN	16	–	–	0,8	.031	0,9	.035	–	20	–	–	●	–
LT16NR24UN	16	–	–	0,7	.027	0,8	.031	–	24	–	–	●	–
LT16NR28UN	16	–	–	0,6	.024	0,7	.027	–	28	–	–	●	–
LT16NR32UN	16	–	–	0,6	.024	0,6	.024	–	32	–	–	●	–
LT16NR8UN	16	–	–	1,1	.043	1,5	.059	–	8	–	–	●	–
left hand													
LT11NL32UN	11	–	–	0,6	.024	0,6	.024	–	32	–	–	●	–
LT16NL10UN	16	–	–	1,1	.043	1,5	.059	–	10	–	–	●	–
LT16NL12UN	16	–	–	1,1	.043	1,4	.055	–	12	–	–	●	–
LT16NL16UN	16	–	–	0,9	.035	1,1	.043	–	16	–	–	●	–



American
UN-Internal



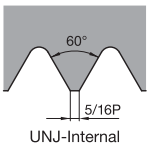


● first choice
○ alternate choice

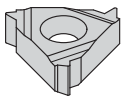
P		●	●	●
M		●	●	●
K		●	●	●
N		○	○	○
S		●	●	●
H		○		

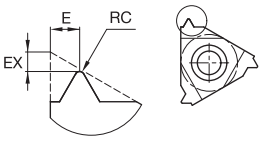
LT-NR-UNCB

catalog number	insert size	RC mm	RC in	EX mm	EX in	E mm	E in	thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
right hand													
LT11NR16UNCB	11	–	–	0,7	.028	0,8	.031	–	16	–	–	●	–
LT11NR18UNCB	11	–	–	0,6	.024	0,8	.031	–	18	–	–	●	–
LT11NR20UNCB	11	–	–	0,6	.024	0,8	.031	–	20	–	–	●	–
LT11NR24UNCB	11	–	–	0,7	.028	0,8	.031	–	24	–	–	●	–
LT11NR32UNCB	11	–	–	1,2	.047	0,5	.020	–	32	–	–	●	–
LT16NR10UNCB	16	–	–	1,1	.043	1,5	.059	–	10	–	–	●	–
LT16NR12UNCB	16	–	–	1,1	.043	1,5	.059	–	12	–	–	●	–
LT16NR14UNCB	16	–	–	1,1	.043	1,5	.059	–	14	–	–	●	–
LT16NR16UNCB	16	–	–	0,7	.028	0,8	.031	–	16	–	–	●	–
LT16NR18UNCB	16	–	–	0,6	.024	0,8	.031	–	18	–	–	●	–
LT16NR20UNCB	16	–	–	0,7	.028	0,6	.024	–	20	–	–	●	–
LT16NR8UNCB	16	–	–	1,1	.043	1,5	.059	–	8	–	–	●	–



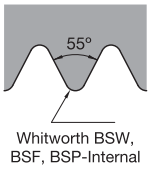
UNJ-Internal

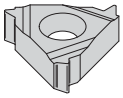


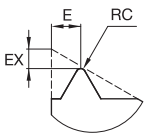


LT-NR/L-UNJ

catalog number	insert size	RC mm	RC in	EX mm	EX in	E mm	E in	thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
right hand													
LT11NR14UNJ	11	–	–	1,0	.039	1,2	.047	–	14	–	–	●	–
LT11NR16UNJ	11	–	–	0,9	.035	1,1	.043	–	16	–	–	●	–
LT11NR18UNJ	11	–	–	0,8	.031	1,0	.039	–	18	–	–	●	–
LT16NR12UNJ	16	–	–	1,1	.043	1,3	.051	–	12	–	–	●	–
LT16NR16UNJ	16	–	–	0,9	.035	1,1	.043	–	16	–	–	●	–





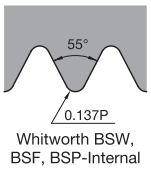


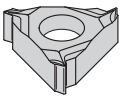
● first choice
○ alternate choice

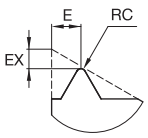
P		●	●	●
M		●	●	●
K		●	●	●
N		○	○	○
S		●	●	●
H		○		

LT-NR/L-W

catalog number	insert size	RC mm	RC in	EX mm	EX in	E mm	E in	thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
right hand													
LT11NR14W	11	–	–	0,9	.035	1,09	.043	–	14	–	–	●	–
LT11NR19W	11	–	–	0,8	.031	0,99	.039	–	19	–	–	●	–
LT16NR10W	16	–	–	1,1	.043	1,50	.059	–	10	–	–	●	–
LT16NR11W	16	–	–	1,1	.043	1,50	.059	–	11	–	●	●	–
LT16NR12W	16	–	–	1,1	.043	1,40	.055	–	12	–	–	●	–
LT16NR14W	16	–	–	1,0	.039	1,19	.047	–	14	–	–	●	–
LT16NR16W	16	–	–	0,9	.035	1,09	.043	–	16	–	–	●	–
LT16NR19W	16	–	–	0,8	.031	0,99	.039	–	19	–	–	●	–
LT16NR20W	16	–	–	0,8	.031	0,89	.035	–	20	–	–	●	–
LT16NR8W	16	–	–	1,2	.047	1,50	.059	–	8	–	–	●	–
LT22NR7W	22	–	–	1,6	.063	2,29	.090	–	7	–	–	●	–
left hand													
LT16NL11W	16	–	–	1,1	.043	1,50	.059	–	11	–	–	●	–







LT-NR-WCB

catalog number	insert size	RC mm	RC in	EX mm	EX in	E mm	E in	thread pitch mm	TPI	TPF	KC5010	KC5025	KU25T
right hand													
LT16NR11WCB	16	–	–	1,3	.051	1,50	.059	–	11	–	–	●	–
LT16NR14WCB	16	–	–	1,3	.051	1,50	.059	–	14	–	–	●	–

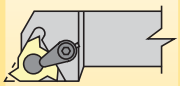
How Do Catalog Numbers Work?

Each character in our catalog number signifies a specific trait of that product. Use the following key columns and corresponding image to easily identify which attributes apply.

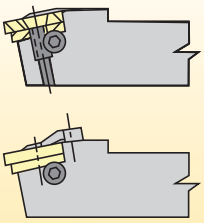
Inch

L	S	AS	R		16	3	
Insert Style	Insert Holding Method	Tool Style	Hand of Tool	Drop Head	Shank Size	Insert Size	Qualified Surface and Length

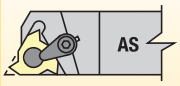
L — Laydown triangle



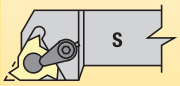
S — Insert screw or clamp only



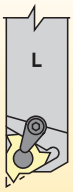
Straight shank



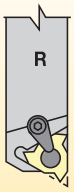
Offset shank



Left hand

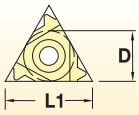


Right hand



Inch:
This shows a two-digit number that indicates the holder cross section. For shanks 5/8" square and over, the number will represent the number of sixteenths of width and height. For shanks under 5/8" square, the number of sixteenths of cross section will be preceded by a zero. For rectangular holders, the first digit represents the number of eighths of width, and the second digit the number of quarters of height, except for a toolholder 1-1/4" x 1-1/2", which is given the number 91.

Size equals number of 1/8" increments of IC.



inch insert size	metric insert size	D inch	L1 inch
2	11	1/4	0.433
3	16	3/8	0.650
4	22	1/2	0.866

C — qualified back and end, 5" long

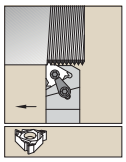
D — qualified back and end, 6" long

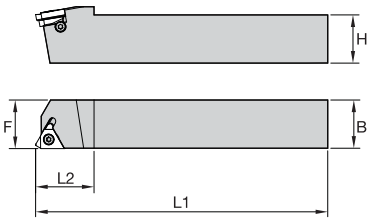
E — qualified back and end, 7" long

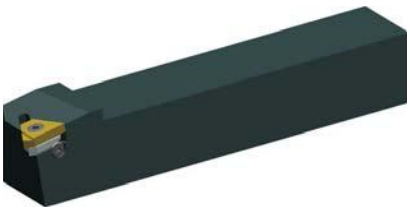
T — qualified back and end, 3.25" long

Q — qualified metric holder

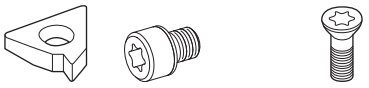
NOTE: Toolholders with primary shank sizes larger than 1/2" or 12mm are supplied with clamp and insert screw. Secure the insert with either the camp or insert screw. **Do not use both.**
For Threading Shim Catalog Numbering System, please see page D73.



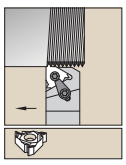


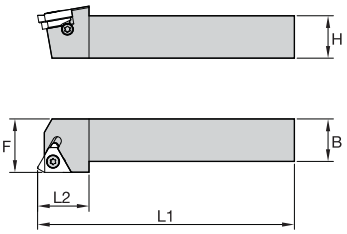


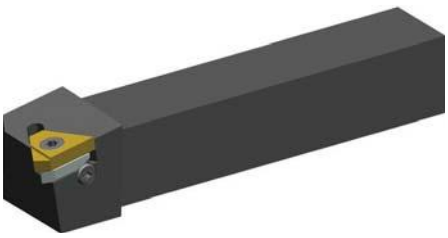
LSA



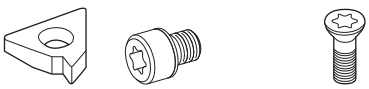
order number	catalog number	H	B	F	L1	gage insert	shim	shim screw	Torx	insert screw	Torx
right hand											
1106230	LSASR83	.500	.500	.500	3.250	LT16ER	SMYE3	SSY3T	T10	SSA3T	T10
1281801	LSASR103	.625	.625	.630	5.000	LT16ER	SMYE3	SSY3T	T10	SSA3T	T10
1281802	LSASR123	.750	.750	.750	5.000	LT16ER	SMYE3	SSY3T	T10	SSA3T	T10
1281803	LSASR163	1.000	1.000	1.000	6.000	LT16ER	SMYE3	SSY3T	T10	SSA3T	T10
1281804	LSASR164	1.000	1.000	1.000	6.000	LT22ER	SMYE4	SSY4T	T20	SSA4T	T20
1281805	LSASR203	1.250	1.250	1.250	7.000	LT16ER	SMYE3	SSY3T	T10	SSA3T	T10
left hand											
1281800	LSASL83	.500	.500	.500	3.250	LT16EL	SMYI3	SSY3T	T10	SSA3T	T10
1281796	LSASL103	.625	.625	.630	5.000	LT16EL	SMYI3	SSY3T	T10	SSA3T	T10
1281797	LSASL123	.750	.750	.750	5.000	LT16EL	SMYI3	SSY3T	T10	SSA3T	T10
1281798	LSASL163	1.000	1.000	1.000	6.000	LT16EL	SMYI3	SSY3T	T10	SSA3T	T10
1281799	LSASL164	1.000	1.000	1.000	6.000	LT22EL	SMYI4	SSY4T	T20	SSA4T	T20



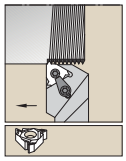


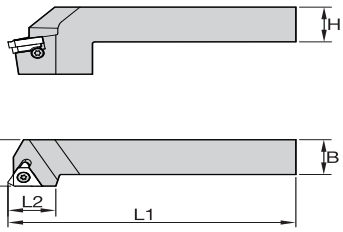


LSS



order number	catalog number	H	B	F	L1	LH	gage insert	shim	shim screw	Torx	insert screw	Torx
right hand												
1281817	LSSR123D	.750	.750	1.000	6.000	1.000	LT16ER	SMYE3	SSY3T	T10	SSA3T	T10
1281818	LSSR163D	1.000	1.000	1.250	6.000	1.000	LT16ER	SMYE3	SSY3T	T10	SSA3T	T10
1281819	LSSR164D	1.000	1.000	1.250	6.000	1.200	LT22ER	SMYE4	SSY4T	T20	SSA4T	T20
1281820	LSSR203D	1.250	1.250	1.500	6.000	1.000	LT16ER	SMYE3	SSY3T	T10	SSA3T	T10
1192326	LSSR204D	1.250	1.250	1.500	6.000	1.200	LT22ER	SMYE4	SSY4T	T20	SSA4T	T20
left hand												
1281812	LSSL123D	.750	.750	1.000	6.000	1.000	LT16EL	SMYI3	SSY3T	T10	SSA3T	T10
1281813	LSSL163D	1.000	1.000	1.250	6.000	1.000	LT16EL	SMYI3	SSY3T	T10	SSA3T	T10
1281814	LSSL164D	1.000	1.000	1.250	6.000	1.200	LT22EL	SMYI4	SSY4T	T20	SSA4T	T20





LSS-DH



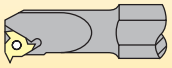
order number	catalog number	H	B	F	L1	LH	gage insert	shim	shim screw	Torx	insert screw	Torx
right hand												
1281815	**LSSRDH123C**	.750	.750	1.000	5.000	1.500	LT16ER	**SMYE3**	**SSY3T**	T10	**SSA3T**	T10
1281816	**LSSRDH164D**	1.000	1.000	1.250	6.000	1.500	LT22ER	**SMYE4**	**SSY4T**	T20	**SSA4T**	T20

How Do Catalog Numbers Work?

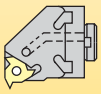
Each character in our catalog number signifies a specific trait of that product. Use the following key columns and corresponding image to easily identify which attributes apply.

S	08	12	L	S	E	R	2
Bar Type	Primary Necked Shank Bar Diameter	Secondary (Mounting) Bar Diameter	Insert Style	Insert Holding Method	Bar Style	Hand of Tool	Insert Size

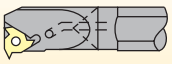
S — Steel shank without coolant



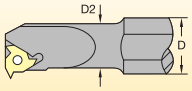
H — Interchangeable head with coolant



E — Carbide with coolant

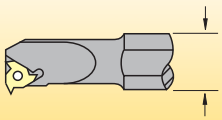


Indicates the primary bar diameter in 1/16" increments.

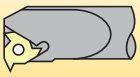


NOTE: Boring bars with primary bar diameters larger than 5/8" are supplied with clamp and insert screw. Secure the insert with either the clamp or insert screw. **Do not use both.**

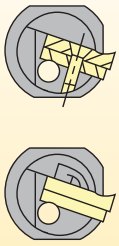
Indicates the secondary bar diameter in 1/16" increments.



L — Laydown triangle

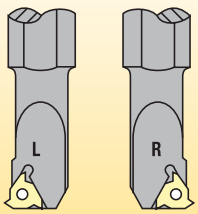


S — Insert screw

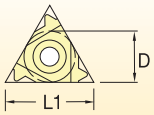


End cutting edge mount

Left Hand | Right Hand



Size equals number of 1/8" increments of IC.

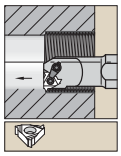


inch insert size	metric insert size	D inch	L1 inch
2	11	1/4	0.433
3	16	3/8	0.650
4	22	1/2	0.866

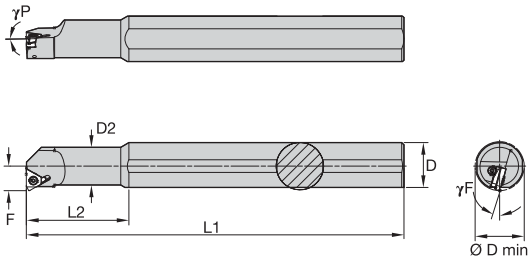
LT Threading Shim Catalog Numbering System

SM	Y	E	3	2P
Shim	Shim for LT Standard Inserts	Insert Threading	Insert Size	Shim Angle
		E = External **I** = Internal	D value in 1/8"	**2P** = 2° positive **1P** = 1° positive **—** = 0° neutral **1N** = 1° negative **2N** = 2° negative **3N** = 3° negative

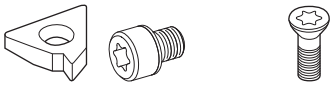
For shims and shim kits, see pages D104–D105.



Steel shank without through coolant.

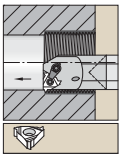


S-LSE

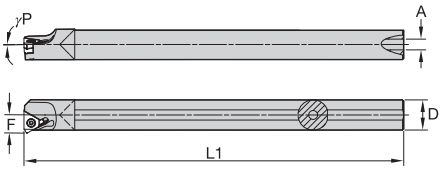


order number	catalog number	D	D min	D2	F	L1	L2	γF°	γP°	gage insert	shim	shim screw	Torx	insert screw	Torx
right hand															
1288896	**S0612LSER2**	.750	.500	.375	.280	7.000	1.000	-15.0	-1.5	LT11NR	**–**	**–**	–	**SSN2T**	T8
1288908	**S0812LSER2**	.750	.650	.500	.350	7.000	1.250	-15.0	-1.5	LT11NR	**–**	**–**	–	**SSN2T**	T8
1288921	**S1012LSER3**	.750	.800	.625	.460	7.000	1.500	-15.0	-1.5	LT16NR	**–**	**–**	–	**SN3TPKG**	T10
1288937	**S1212LSER3**	.750	.900	–	.510	7.000	–	-15.0	-1.5	LT16NR	**SMYI3**	**SSY3T**	T10	**SSA3T**	T10
1288961	**S1620LSER3**	1.250	1.200	1.000	.650	10.000	2.500	-15.0	-1.5	LT16NR	**SMYI3**	**SSY3T**	T10	**SSA3T**	T10
1288962	**S1620LSER4**	1.250	1.250	1.000	.710	10.000	2.500	-15.0	-1.5	LT22NR	**SMYI4**	**SSY4T**	T20	**SSA4T**	T20
1192442	**S2020LSER3**	1.250	1.450	–	.770	10.000	–	-15.0	-1.5	LT16NR	**SMYI3**	**SSY3T**	T10	**SSA3T**	T10
1288982	**S2020LSER4**	1.250	1.500	–	.850	10.000	–	-15.0	-1.5	LT22NR	**SMYI4**	**SSY4T**	T20	**SSA4T**	T20
left hand															
1288895	**S0612LSEL2**	.750	.500	.375	.280	7.000	1.000	-15.0	-1.5	LT11NL	**–**	**–**	–	**SSN2T**	T8
1288907	**S0812LSEL2**	.750	.650	.500	.350	7.000	1.250	-15.0	-1.5	LT11NL	**–**	**–**	–	**SSN2T**	T8
1288920	**S1012LSEL3**	.750	.800	.625	.460	7.000	1.500	-15.0	-1.5	LT16NL	**–**	**–**	–	**SN3TPKG**	T10
1288936	**S1212LSEL3**	.750	.900	–	.510	7.000	–	-15.0	-1.5	LT16NL	**SMYE3**	**SSY3T**	T10	**SSA3T**	T10
1288958	**S1620LSEL3**	1.250	1.200	1.000	.650	10.000	2.500	-15.0	-1.5	LT16NL	**SMYE3**	**SSY3T**	T10	**SSA3T**	T10
1288960	**S1620LSEL4**	1.250	1.250	1.000	.710	10.000	2.500	-15.0	-1.5	LT22NL	**SMYE4**	**SSY4T**	T20	**SSA4T**	T20

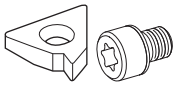
NOTE: Items listed without a shim are designed for a 1.5° inclination angle.



Carbide shank with through coolant.

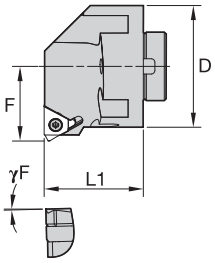


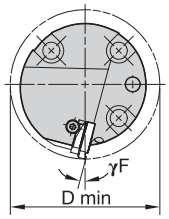
E-LSE



order number	catalog number	D	D min	F	L1	A	γF°	γP°	gage insert	shim	shim screw	Torx	insert screw	Torx
right hand														
1152676	**E06LSER2**	.375	.500	.280	6.000	.125	-15.0	-1.5	LT11NR	**–**	**–**	–	**SSN2T**	T8
1152678	**E08LSER2**	.500	.650	.350	8.000	.187	-15.0	-1.5	LT11NR	**–**	**–**	–	**SSN2T**	T8
1152680	**E10LSER3**	.625	.800	.460	10.000	.218	-15.0	-1.5	LT16NR	**–**	**–**	–	**SN3TPKG**	T10
1152682	**E12LSER3**	.750	.900	.510	10.000	.281	-15.0	-1.5	LT16NR	**SMYI3**	**SSY3T**	T10	**SSA3T**	T10
1152684	**E16LSER3**	1.000	1.200	.650	12.000	.312	-15.0	-1.5	LT16NR	**SMYI3**	**SSY3T**	T10	**SSA3T**	T10
1152686	**E16LSER4**	1.000	1.250	.710	12.000	.312	-15.0	-1.5	LT22NR	**SMYI4**	**SSY4T**	T20	**SSA4T**	T20
left hand														
1152677	**E06LSEL2**	.375	.500	.280	6.000	.125	-15.0	-1.5	LT11NL	**–**	**–**	–	**SSN2T**	T8
1152679	**E08LSEL2**	.500	.650	.350	8.000	.187	-15.0	-1.5	LT11NL	**–**	**–**	–	**SSN2T**	T8
1152681	**E10LSEL3**	.625	.800	.460	10.000	.218	-15.0	-1.5	LT16NL	**–**	**–**	–	**SN3TPKG**	T10
1152683	**E12LSEL3**	.750	.900	.510	10.000	.281	-15.0	-1.5	LT16NL	**SMYE3**	**SSY3T**	T10	**SSA3T**	T10

NOTE: Items listed without a shim are designed for a 1.5° inclination angle.



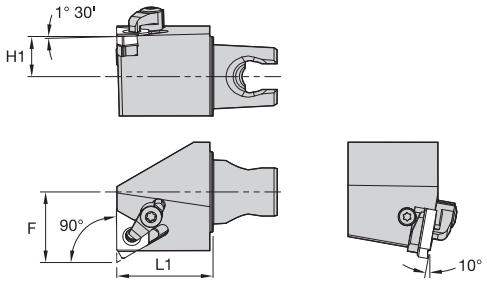


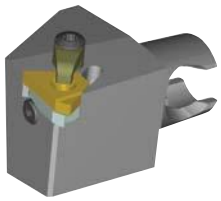
H-LSE



order number	catalog number	D	D min	L1	F	γF°	γP°	gage insert	shim	shim screw	Torx	insert screw	Torx
right hand													
1095216	**H16LSER3**	1.000	1.200	1.63	.645	-15.0	-1.5	LT16NR	**SMYI3**	**SSY3T**	T10	**SSA3T**	T10
1095218	**H20LSER3**	1.250	1.450	1.63	.760	-15.0	-1.5	LT16NR	**SMYI3**	**SSY3T**	T10	**SSA3T**	T10
1095220	**H24LSER3**	1.500	1.760	1.63	.885	-15.0	-1.5	LT16NR	**SMYI3**	**SSY3T**	T10	**SSA3T**	T10
1095224	**H24LSER4**	1.500	1.782	1.63	.973	-15.0	-1.5	LT22NR	**SMYI4**	**SSY4T**	T20	**SSA4T**	T20
1095222	**H32LSER3**	2.000	2.400	1.63	1.276	-15.0	-1.5	LT16NR	**SMYI3**	**SSY3T**	T10	**SSA3T**	T10
1095226	**H32LSER4**	2.000	2.400	1.63	1.276	-15.0	-1.5	LT22NR	**SMYI4**	**SSY4T**	T20	**SSA4T**	T20
3842895	**H32LSER5**	2.000	2.400	1.63	1.281	-15.0	-1.5	LT27NR	**SMYI5**	**SSY5T**	T25	**SSA5T**	T25
3842897	**H40LSER5**	2.500	3.030	1.63	1.531	-15.0	-1.5	LT27NR	**SMYI5**	**SSY5T**	T25	**SSA5T**	T25

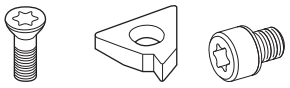
NOTE: For boring adapters, see pages B406–B409.



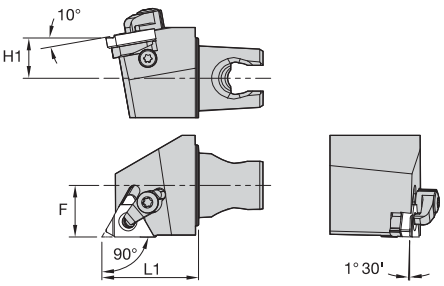


Clamp shown in images is no longer available.

LSE • End Mount

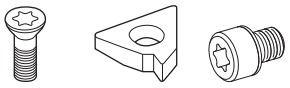


order number	catalog number	L1 mm	L1 in	F mm	F in	H1 mm	H1 in	gage insert	insert screw	shim	shim screw
right hand											
2399506	**KM25LSER1630**	30	1.181	22	.866	12,5	.492	LT16EL	**SSA3T**	**SMYI3**	**SSY3T**
left hand											
2399507	**KM25LSEL1630**	30	1.181	22	.866	12,5	.492	LT16ER	**SSA3T**	**SMYE3**	**SSY3T**

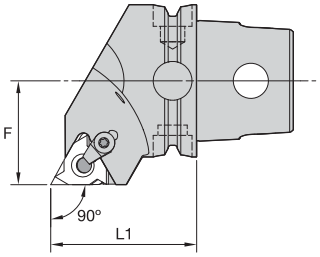


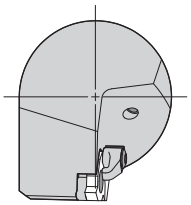
Clamp shown in images is no longer available.

LSS • Side Mount



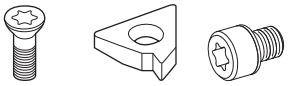
order number	catalog number	L1 mm	L1 in	F mm	F in	H1 mm	H1 in	gage insert	insert screw	shim	shim screw
right hand											
2399504	**KM25LSSR1630**	30	1.181	16	.630	12,5	.492	LT16ER	**SSA3T**	**SMYE3**	**SSY3T**
3176219	**KM25LSSR2230**	30	1.181	16	.630	12,5	.492	LT22ER	**SSA4T**	**SMYE4**	**SSY4T**
left hand											
2399505	**KM25LSSL1630**	30	1.181	16	.630	12,5	.492	LT16EL	**SSA3T**	**SMYI3**	**SSY3T**
3176220	**KM25LSSL2230**	30	1.181	16	.630	12,5	.492	LT22EL	**SSA4T**	**SMYI4**	**SSY4T**



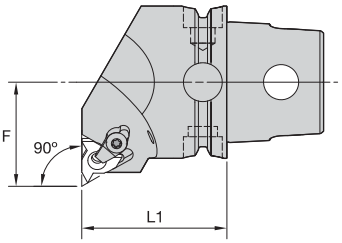


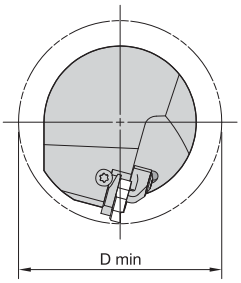
Clamp shown in images is no longer available.

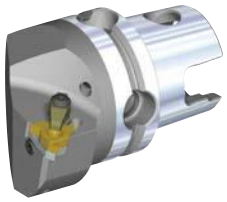
LSS 90°



order number	catalog number	L1 mm	L1 in	F mm	F in	gage insert	insert screw	shim	shim screw	kg	lbs
right hand											
3950857	**KM40TSLSSR16**	40	1.575	27	1.063	LT16ER	**SSA3T**	**SMYE3**	**SSY3T**	0,31	.68
3950858	**KM40TSLSSR22**	40	1.575	27	1.063	LT22ER	**SSA4T**	**SMYE4**	**SSY4T**	0,30	.66
3959401	**KM40TSLSSR27**	45	1.772	27	1.063	LT27ER	**SSA5T**	**SMYE5**	**SSY5T**	0,37	.82
left hand											
3950855	**KM40TSLSSL16**	40	1.575	27	1.063	LT16EL	**SSA3T**	**SMYI3**	**SSY3T**	0,32	.70
3950856	**KM40TSLSSL22**	40	1.575	27	1.063	LT22EL	**SSA4T**	**SMYI4**	**SSY4T**	0,31	.68
3959400	**KM40TSLSSL27**	45	1.772	27	1.063	LT27EL	**SSA5T**	**SMYI5**	**SSY5T**	0,37	.82



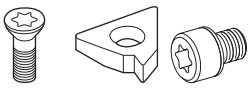




KM™ QUICK CHANGE

Clamp shown in images is no longer available.

LSE-N 90° • Internal Only



order number	catalog number	L1 mm	L1 in	F mm	F in	D min mm	D min in	gage insert	insert screw	shim	shim screw	kg	lbs
right hand													
3950832	**KM40TSLSER16N**	40	1.575	27	1.063	54	2.126	LT16NR	**SSA3T**	**SMYI3**	**SSY3T**	0,35	.77
3950854	**KM40TSLSER22N**	40	1.575	27	1.063	54	2.126	LT22NR	**SSA4T**	**SMYI4**	**SSY4T**	0,35	.77
3959399	**KM40TSLSER27N**	45	1.772	27	1.063	54	2.126	LT27NR	**SSA5T**	**SMYI5**	**SSY5T**	0,39	.86
left hand													
3950831	**KM40TSLSEL16N**	40	1.575	27	1.063	54	2.126	LT16NL	**SSA3T**	**SMYE3**	**SSY3T**	0,35	.77

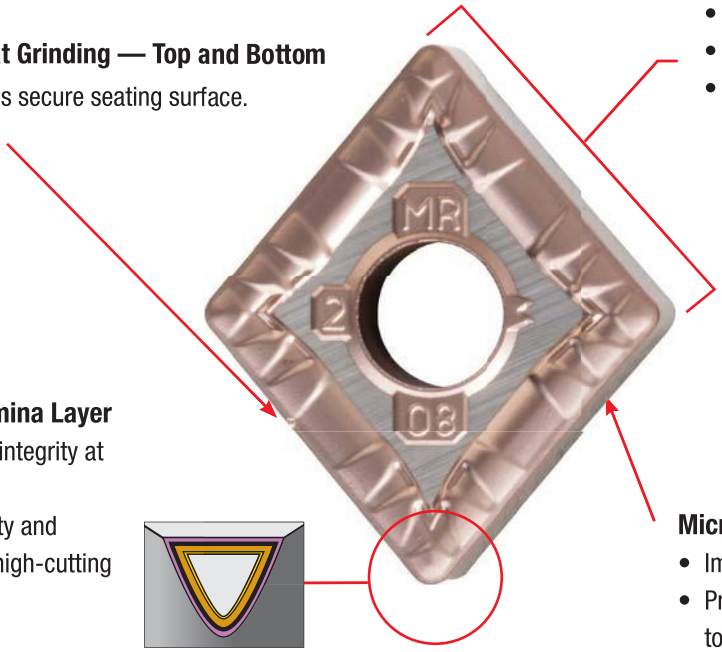
Beyond™ Drive™ Inserts

- Designed for increased productivity.
- Post-coat treatment reduces stress, improves coating adhesion.
- Excellent toughness and wear resistance.
- Better insert wear detection.

beyond™ DRIVE™

Post-Coat Treatment
- Improves edge toughness.
- Long predictable tool life.
- Reduces depth-of-cut notching.
- Wide range of applications.

Post-Coat Grinding — Top and Bottom
- Provides secure seating surface.



Fine-Grained Alumina Layer
- Provides coating integrity at elevated speeds.
- Higher productivity and dependability at high-cutting temperatures.

TiN/MT-TiCN/TiCN/Al_2O_3/TiOCN

Micro-Polished Edges
- Improves edge toughness.
- Provides smooth outer surface to reduce forces, friction, and workpiece sticking.

Experience the advantages at your Authorized Kennametal Distributor or at **kennametal.com**.

KENNAMETAL®

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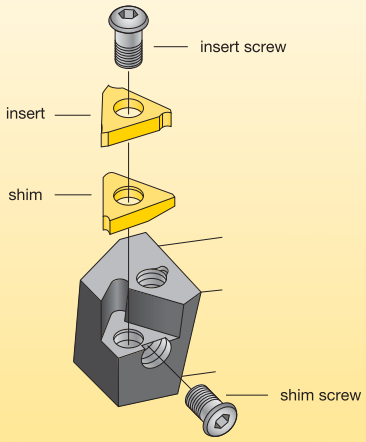
Laydown Threading Toolholders

In all cases, the proper shim selection is important.

Kennametal toolholders are supplied with a shim for a 1.5° lead angle. Change the shim if your thread is more than 1° different.
For more details on proper shim selections, see pages D104–D105.



insert size and screw	insert screw	shim	shim screw and washer
3ER	SS-A3T	SM-YIE3	SS-Y3T
3EL	SS-A3T	SM-YI3	SS-Y3T
4ER	SS-A4T	SM-YIE4	SS-Y4T
4EL	SS-A4T	SM-YI4	SS-Y4T
Laydown Threading boring bars			
2IR	SS-N2T	–	–
2IL	SS-N2T	–	–
3IR	SS-A3T	SM-YI3	SS-Y3T
3IL	SS-A3T	SM-YIE3	SS-Y3T
4IR	SS-A4T	SM-YI4	SS-Y4T
4IL	SS-A4T	SM-YIE4	SS-Y4T

SM	—	Y	E	3	—	2N
Shim		Y-shim for Laydown standard inserts	E – External I – Internal	IC – 1/8"		Shim Angle

2P	2° positive
1P	1° positive
–	0°
1N	1° negative
2N	2° negative
3N	3° negative

resultant angle		3.5°	2.5°	1.5°	0.5°	-0.5°	-1.5°
insert size (IC)	toolholder	shim ordering code					
3/8"	ex. RH/in. LH ex. LH/in. RH	SM-YE3-2P SM-YI3-2P	SM-YE3-1P SM-YI3-1P	SM-YE3 SM-YI3	SM-YE3-1N SM-YI3-1N	SM-YE3-2N SM-YI3-2N	SM-YE3-3N SM-YI3-3N
1/2"	ex. RH/in. LH ex. LH/in. RH	SM-YE4-2P SM-YI4-2P	SM-YE4-1P SM-YI4-1P	SM-YE4 SM-YI4	SM-YE4-1N SM-YI4-1N	SM-YE4-2N SM-YI4-2N	SM-YE4-3N SM-YI4-3N

Slanted Shim Kit

Because you might occasionally need different shims than those supplied with our standard toolholders, we strongly recommend that shim kits be readily available in every tool shop.

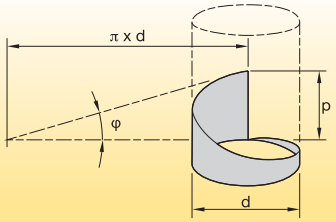
insert size	shim size (D)	ordering code	contains slanted shims
3x	3/8"	ABY3SET	SM-YE3-2P, 1P, 1N, 2N, 3N SM-YI3-2P, 1P, 1N, 2N, 3N
4x	1/2"	ABY4	SM-YE4-2P, 1P, 1N, 2N, 3N SM-YI4-2P, 1P, 1N, 2N, 3N

The Helix Angle

Example:
d = 1.892" (48,06mm)
p = .125" (3,175mm)

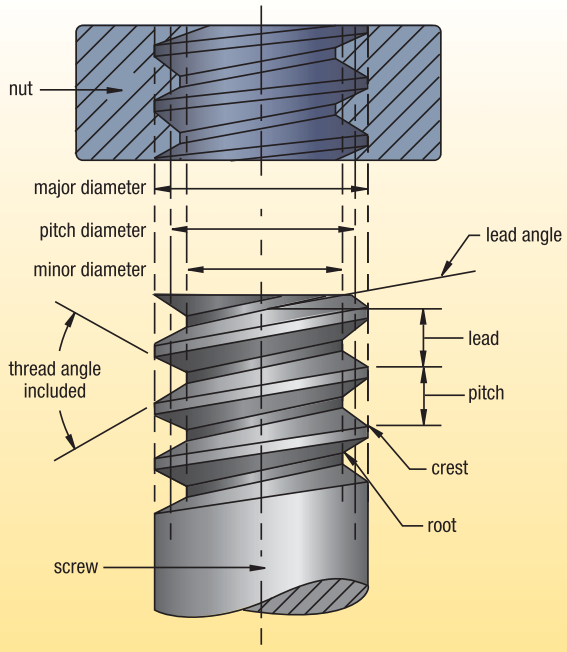
ϕ = Helix angle
p = pitch
d = pitch diameter

$$\phi = \arctan\left(\frac{p * starts}{\pi * \varnothing}\right) = 1.13°$$



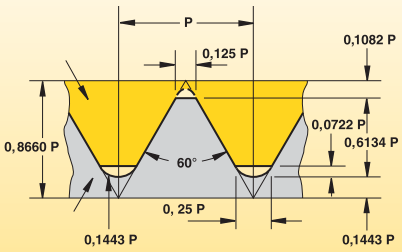
Screw Thread Definitions

1. **Major diameter** — The largest diameter of a straight screw thread. This applies to both internal and external threads.
2. **Pitch diameter** — On a straight thread, it is the diameter which passes through the thread profiles at such points which make the thread width of the groove equal to one-half of the basic pitch. On a "perfect thread," this occurs at the point where the widths of the thread and groove are equal.
3. **Thread angle (included)** — The included angle between the individual flanks of the thread form.
4. **Minor diameter** — The smallest diameter of a straight screw thread. This applies to both internal and external threads.
5. **Lead angle** — On a straight thread, the lead angle is the angle created by the helix of the thread at the pitch diameter with a plane perpendicular to the axis.
6. **Lead** — The distance a screw thread advances axially in one revolution. On a single start, the pitch and lead are identical. The lead is equal to the pitch times the number of starts.
7. **Pitch** — The distance from a point on a screw thread to a corresponding point on the next thread measured parallel to the thread axis.
8. **Crest** — The outer most surface of the thread form which joins the flanks.
9. **Root** — The inner most surface of the thread form which joins the flanks.



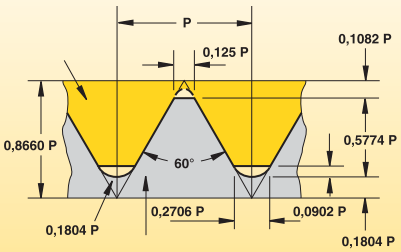
NOTE: Threads per inch (TPI) not shown:
The number of threads per inch measured axially.
The terms pitch and TPI are often used interchangeably. TPI = 1/pitch

ISO M (Metric) and UN (Unified National)



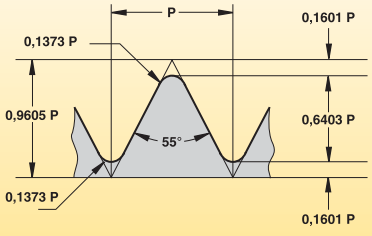
Use: All branches of mechanical industry.

UNJ (controlled root radius)



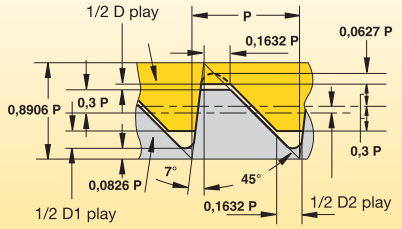
Use: Aircraft and space industry.

Whitworth (BSW)



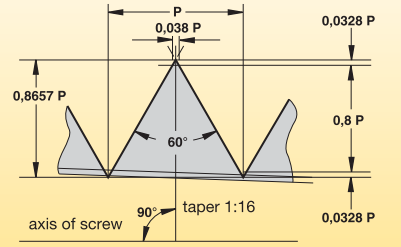
Use: Fittings and pipe couplings for gas, water, and sewer lines (replaced by ISO).

American Buttress



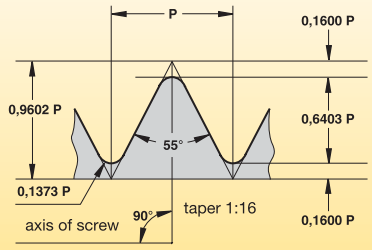
Use: Fittings and pipe couplings.

NPT (American National Pipe Thread)



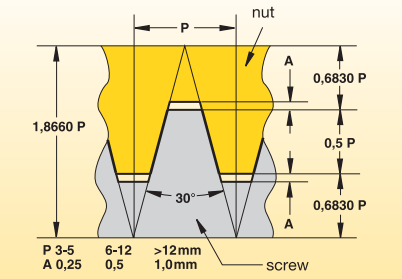
Use: Fittings and pipe couplings.

BSPT (British Standard Pipe Thread)



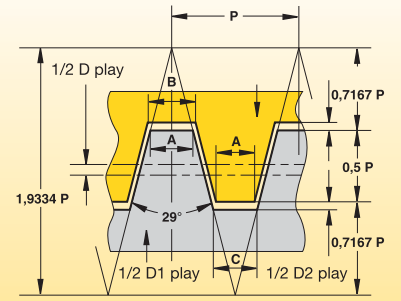
Use: Pipe thread for steam, gas, and water lines.

TR DIN 103



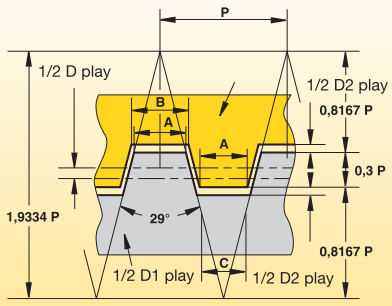
Use: Mechanical industry for motion transmission screws.

Acme



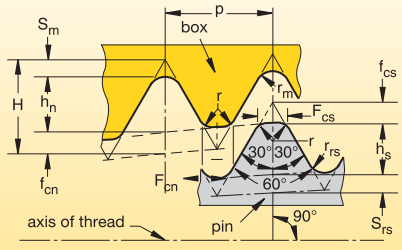
A = 0,0307 P
B = 0,3707 P—x D play
C = 0,3707 P—(D1 play—D2 play)
Use: Acme-General is used in mechanical industry for motion transmission screws.

Acme, truncated (Stub)



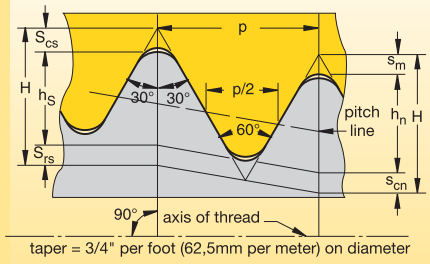
A = 0,4224 P
B = 0,4224 P—x D play
C = 0,4224 P—(D1 play—D2 play)
Use: Where normal Acme is too deep.

API Rotary Shoulder Connection



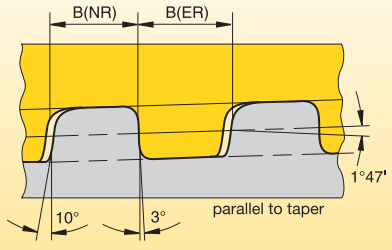
NOTE: Taper shown exaggerated.

API Casing and Tubing Round Thread Form



NOTE: Taper shown exaggerated.

API Buttress

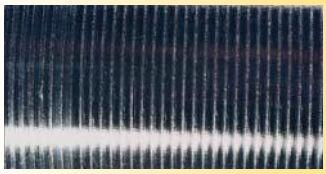


Suggested Grades and Speeds for Threading Various Workpiece Materials

workpiece group	workpiece material	recommended surface speed — SFM				
		uncoated	PVD coated			
		K68	KC5010	KC5025	KC5410	KU25T
free-machining carbon steel	10L18, 10L45, 1213, 12L13, 12L14, 1140, 1141, 11L44, 1151, 10L50	—	300–650	150–650	—	300–450
plain carbon steel	10063, 1008, 1010, 1015, 1018, 1020, 1025, 1026, 1108, 1117	—	250–650	150–575	—	250–400
alloy steels/tool steels 150–325 HB (up to 35 HRC)	1042, 1045, 1070, 1080, 1085, 1090, 1095, 1541, 1561, 1572, 5140, 8620, W1, O1, S1, P20, H13, D2, A6, H13, L6	—	250–650	125–550	—	250–400
alloy steels/tool steels 330–450 HB (36–47 HRC)		—	200–525	—	—	200–350
martensitic/ferritic stainless/precipitation hardening	416, 420F, 440F, 405, 409, 429, 430, 434, 436, 442, PH	—	150–525	100–400	—	80–200
austenitic stainless steel	201, 202, 301, 302, 303, 304, 304, 305, 321, 347, 348, 310, 314, 316, 316L, 330	200–350	200–650	150–450	—	80–350
gray cast iron 135–270 HB	class 20, 30, 35, 45	200–300	200–775	150–400	—	100–355
gray cast iron 275–450 HB	class 50, 55, 60	150–250	150–575	50–250	—	100–355
alloy/ductile iron	A536, J434C, 60-40-18, 80-55-06, 100-70-03	150–250	150–650	100–525	—	100–355
free-machining aluminum alloys	2024-T4, 2014-T6, 6061-T6 2011-T3, 3003-H18, A2, Alcan, Alcoa 510, Duralumin	400–800	400–1200	—	500–1500	100–1000
high-silicon aluminum alloys	A380, A390, A380-1, A390-1, A380-2	—	—	—	—	—
copper/zinc/brass		250–600	250–1000	150–775	—	100–800
non-metallics	Graphite, Nylon, Plastics, Rubbers, Phenolics, Carbon	400–1500	400–1300	150–1000	—	100–1000
high-temperature alloys 125–269 HB (up to 27 HRC)	Nickel 200, Monel, R405, Monel K500, INCONEL 600, INCONEL® 625/901x750/718, Waspaloy, Hastelloy C	80–120	80–400	40–250	—	45–270
high-temperature alloys 260–450 HB (26–47 HRC)	Rene 95, Waspaloy A286, Incoloy 800, Haynes 188, Stellite F, Haynes 25	80–100	100–250	20–200	—	45–200
titanium alloys	Ti-6Al-4V, TI-5Al-2.5Sn	110–180	110–325	—	—	45–250

NOTE: When workpiece hardness levels are at the top of a range, starting SFM should be at the lower end. Regularly inspect insert clamps for worn flats.

Edge preparation:
Uncoated — sharp
PVD coated — light hone except positive top rake, top rake-sharp

problem	cause	possible solution
thread with torn finish 	• Burs. • Torn finish. • Steps. • Improper shim. • Improper infeed.	• Use modified flank infeed. • Use full profile insert. • Increase coolant concentration. • Increases SFM. • Check machine “Z” travel axis. • Check insert form. • Check for correct shim in LT system. • Calculate flank clearance.
chatter 	• Poor rigidity. • Insert movement. • Improper infeed. • Off centerline.	• Use modified flank infeed. • Minimize tool overhang. • Check for workpiece deflection. • Check insert and clamp. • Verify that tool cutting position is at workpiece centerline. • Adjust number of passes. Fewer passes reduce chatter.
built-up edge 	• Speed too low. • Insufficient coolant. • Chip load.	• Increase SFM. • Increase coolant concentration and/or flow. • Adjust infeed angle. • Increase depth of cut per pass.
deformation 	• Wrong grade. • Speed too high. • Improper infeed angle. • Insufficient coolant.	• Use modified flank infeed. • Use a more wear-resistant grade (e.g., KC5010™). • Reduce SFM. • Increase coolant flow.
chipping  	• Improper infeed. • Chip load. • Wrong grade. • Incorrect speed. • Poor rigidity.	• Use modified flank infeed. • Increase or decrease number of passes. • Eliminate spring passes. • Use tougher grade (e.g., KC5025™). • Increase SFM if chipping on trailing edge. • Decrease SFM if chipping on leading edge. • Minimize tool overhang. • Check for insert movement/check clamp. Torque screw or clamp to correct value. • Check for possible part deflection. • Calculate flank clearance. • Ensure correct shim.
broken nose 	• Heavy chip load. • Small nose radius. • Wrong grade. • Improper infeed.	• Use modified flank infeed. • Decrease chip load. • Use large nose radius if possible. • Use tougher grade (e.g., KC5025).
flank wear 	• Improper shim. • Wrong grade. • Insufficient coolant. • Off centerline. • Insufficient flank clearance. • Improper infeed angle.	• Ensure correct shim. • Use a more wear-resistant grade (e.g., KC5025). • Increase coolant flow. • Check the centerline height of the tool. (The smaller the diameter, the more critical the need for centerline accuracy.) • Calculate flank clearance and change shim to increase clearance on worn flank. • If wear is on trailing flank, increase infeed angle clearance.

(continued)

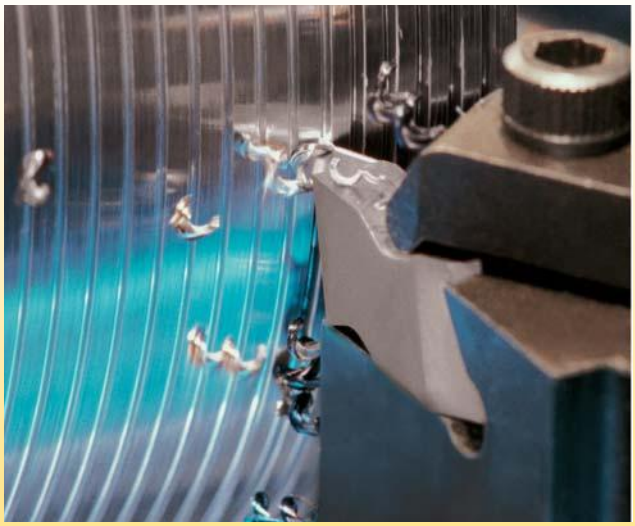
(Technical Information • Failure and Solution Guide — continued)

problem	possible solution																	
	increase SFM	reduce SFM	increase chip load	decrease chip load where failure occurs	use tougher carbide grade	use harder carbide grade	apply coolant	use coated carbide	use topping insert	change infeed angle	check for insert movement and reseat	reduce tool overhang	reselect shim	apply chipbreaker style	reduce DOC	adjust center height	begin cutting threads .472" before workpiece	change infeed method
chatter	•			•							•	•				•		•
bur on crest	•								•									•
short tool life		•	•	•		•		•										•
chipped leading edge			•	•	•													
chipped trailing edge					•					•								
broken nose (first pass)	•														•	•		
broken nose (after first pass)				•	•					•			•					•
built-up on cutting edge	•		•				•	•										•
premature topping													•					
splitting threads																	•	
poor chip evacuation														•				•

Kennametal insert technology brings chip control to your threading operations with the Top Notch™ platform. The proprietary Kennametal recessed chip groove, when used according to our recommendations, controls the chip in most applications. Our positive rake design lowers cutting pressures, which in turn lowers damaging heat generation thus providing better tool life. Long, stringy chips no longer mar the workpiece surface finish. The danger to operators when removing long chips from the workpiece and chuck is eliminated. All of these benefits combine to improve the productivity of your threading operations.

The Last Pass

Some CNC controls require the last pass to be at a 0° infeed angle because the chip will not break on the last pass. On most carbon and alloy steels, the last pass can remain at .005" (0,127mm) depth of cut and produce an acceptable finish. For some materials, a .001" (0,025mm) to .003" (0,076mm) (spring) pass may be used to improve surface finish, however, chipbreaking action may be compromised.

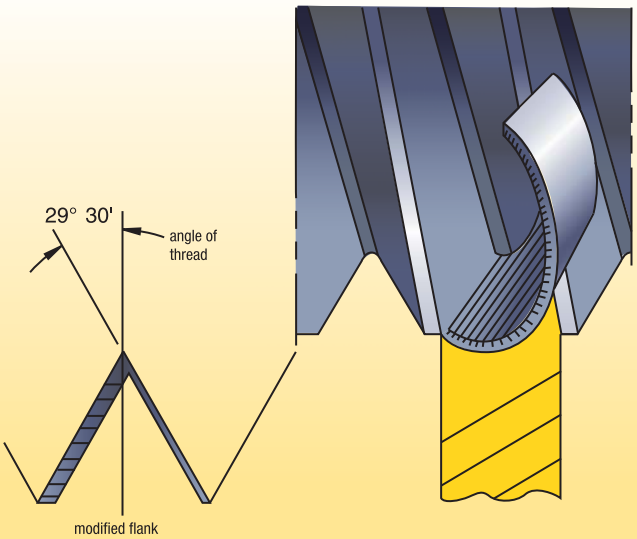


Machine Programming

Modern CNC controls allow the programmer to easily adjust infeed angle, the number of passes, and depth of cut for each pass. The chip control threading insert performs best at an infeed angle of 29° 30', although 15° to 30° is acceptable. Also, it is important to maintain a minimum of .005" (0,127mm) depth of cut on every pass. In most applications, use of CNC canned cycles produce only marginally successful results. Custom written programs are better and are recommended.

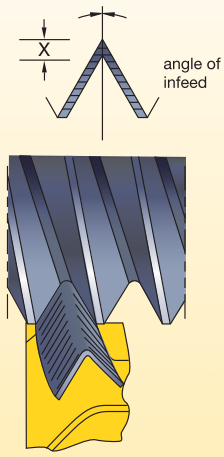
Infeed Angle

In order to effectively and consistently break the chip, it is important to use an infeed angle between 28° and 29° 30'. Do not apply chip control inserts at infeed angles less than 15°.



Radial

modified flank



Advantage —

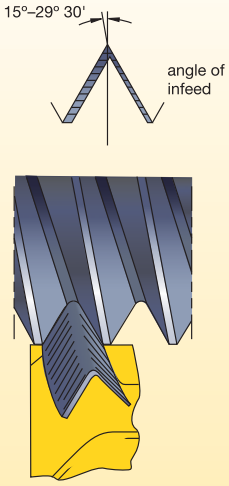
- Cutting on both sides of the thread form places all of the cutting edge in the cut and protects edge from chipping.
- Even wear on the insert.

Disadvantage —

- Tool develops a channel chip that may be difficult to handle.
- Tip chipping occurs when cutting high-tensile materials.
- Bur condition is increased.
- Entire cutting edge is engaged at finish of thread, causing increased tendency to chatter.

Modified flank

modified flank



Advantage —

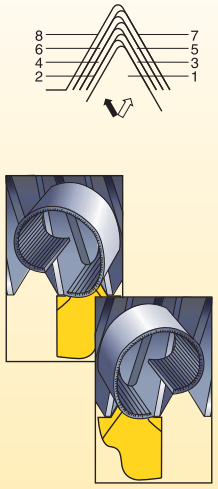
- Tool cuts both sides of thread form, so it is protected from chipping similar to 0° infeed. Channel-type chip develops, but uneven chip thickness helps remove the chip similar to flank infeed.
- This is the preferred method, especially when used with a chip control insert.
- Combined radial and/or alternating flank infeed.
- Results in good tool life, with wear evenly distributed over both flanks.

Disadvantage —

- Similar disadvantages as with 0° infeed, although reduced somewhat in magnitude as cutting forces are better equalized and chip flow is much less of a problem.

Alternating flank

alternating flank



Advantage —

- Increased tool life because both edges are used equally.

NOTE: Some machine tools may require special programming techniques to achieve this method of infeed.

Disadvantage —

- Difficult to cut on conventional machinery.

Reversed modified flank

modified flank

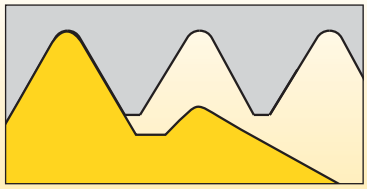
Advantage —

- Tool cuts both sides of thread form, so it is protected from chipping similar to 0° infeed. Channel-type chip develops, but uneven chip thickness helps remove the chip similar to flank infeed.
- This is the preferred method, especially when used with a chip control insert.
- Combined radial and/or alternating flank infeed.
- Results in good tool life, with wear evenly distributed over both flanks.
- As chip flow is the reversed feed direction, it is an excellent choice for internal threading.

Disadvantage —

- Programming needs to be done line by line.

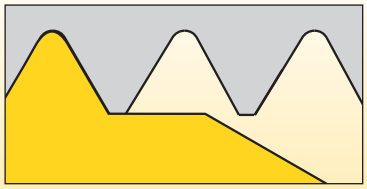
Partial Profile



Tooth profile with universal profile shape:

- Reduced inventory.
- For various pitches in a limited range.
- Major/minor diameters must be accurately pre-turned.

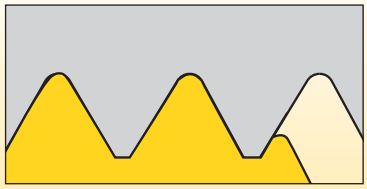
Full Profile



Tooth profile with full profile shape including tooth height:

- For bur-free, precise threads in the specified pitch.
- General application.
- Machining allowance for outside/core diameter around .004–.006".

Multi-Tooth Profile



Multi-tooth full profile generally with 2–3 teeth:

- Highly productive threading with fewer passes and longer tool life.
- Requires a rigid setup and long thread pass through.

Formulas

Inch Formula		
to find	**given**	**formula**
SFM	D (inch) RPM	$SFM = \frac{\pi \times D}{12"} \times RPM$
RPM	D (inch) SFM	$RPM = \frac{SFM \times 12"}{D \times \pi}$

Metric Formula		
to find	**given**	**formula**
m/min	D (mm) RPM	$m/min = \frac{\pi \times D}{1000} \times RPM$
RPM	D (mm) m/min	$RPM = \frac{m/min \times 1000}{D \times \pi}$

Legend

IPM	=	inch per minute
SFM	=	surface feet per minute
m/min	=	meters per minute
RPM	=	revolutions per minute
D	=	part diameter
π	=	3.1416

Maximum Cutting Speeds

On older machines cutting speed is often limited by the maximum travel speed (IPM or mm/min) of the tool allowed by the machine. Check your maximum speed with the following formulas:

inch formula: maximum cutting speed (SFM) =
part diameter (inch) x 3.14 x TPI x $\frac{\text{max IPM}}{12"}$

metric formula: maximum cutting speed (m/min) =
part diameter (mm) x 3.14 x (1/pitch) x $\frac{\text{max mm/min}}{1000mm}$

Flank clearance

γ = arctan (sin (β/2) * tan(α))
γ = side (flank) clearance
β = included angle of thread form
α = radial inclination angle

Thread	Angle	External	Internal
UN & ISO	60	5.3	8
BSW	55	4.8	7.3
TR	30	2.6	4
ACME	29	2.6	3.9
AMBUT	7	.6	.9
AMBUT	45	4	6

Recommendation for Threading Infeed Passes

TPI	48–32	28–24	20–16	14–12	11.5–9	8–6	5–4	3–2
metric pitch (mm)	0,50–0,75	0,80–1	1,25–1,5	1,75–2	2,5–3	3,5–4	4,5–6	8
Thread Type	**recommended number of passes**							
Common V-thread forms ISO, UN, UNJ, NPT, Whitworth, BSPT, API Rotary Shoulder	4–5	5–6	6–8	8–10	9–12	12–15	14–16	15–25
Acme, Trapez, Round, API Round	—	—	5–6	7–8	10–11	12–13	13–15	18–20
Stub Acme, API Buttress	—	—	5	5–6	7–8	8–10	10–12	14–16
American Buttress	—	—	7–8	9–10	11–12	13–15	17–19	22–24

NOTE: Maintain minimum .002" (0,05mm) infeed on last passes to avoid work hardening and excessive abrasion of the threading tool.

Constant Volume Infeed Values for Threading Operations

In most applications, use of CNC canned cycles produces only marginally successful results. For example, an 8-pitch external thread has a depth of .0789" (2mm).

$$\Delta ap_x = \frac{ap}{\sqrt{nap-1}} * \sqrt{\phi}$$

Formula for constant chip load infeed

Δap = radial infeed
x = actual pass (from 1 to the nap)
nap = number of passes
ϕ = 1st pass, 0.3
2nd pass, 1
3rd pass and up, x-1

Using Radial Infeed

Bending stress on the cutting edge caused by V-shaped chips from long-chipping steel workpiece materials.

High cutting forces with small cutting thicknesses require sharp edges with high strength.

Using Flank Infeed

Lower bending stress and stabilized cutting edges produce more favorable chip shapes and larger cutting thicknesses.

Carbides with high hardness, good wear resistance, and temperature stability are advantageous.

Guidelines for Infeeds — How to Determine the Number and the Size of Passes

The number of passes “s” per thread is decisive for successful threading and crest turning. The following tables give standard values for the application condition when machining steel. The proper number of passes must be determined empirically.

If insert breakage occurs, the number of passes must be increased. With increased wear, we recommend decreasing the number of passes. The chip thickness should not be less than .0019" (0,05mm). The allowance at the diameter should not exceed .0078" (0,2mm).

Metric ISO, External Thread Cutting

thread pitch P (mm)	0,50	0,75	1,00	1,25	1,50	1,75	2,00	2,50	3,00	3,50	4,00	4,50	5,00
T Ap (in)	.012	.018	.024	.030	.036	.042	.048	.060	.072	.085	.097	.109	.121
N Ap	4	4	5	6	6	8	8	10	12	14	15	15	16
	values for flank infeed (X/Z)												
order of passes	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z
1	0.0038	0.0057	0.0066	0.0073	0.0088	0.0087	0.0099	0.0110	0.0119	0.0129	0.0142	0.0160	0.0171
2	0.0031	0.0047	0.0054	0.0061	0.0073	0.0072	0.0082	0.0090	0.0098	0.0107	0.0117	0.0132	0.0141
3	0.0029	0.0043	0.0050	0.0056	0.0067	0.0066	0.0075	0.0083	0.0090	0.0098	0.0107	0.0121	0.0129
4	0.0022	0.0033	0.0038	0.0043	0.0051	0.0050	0.0058	0.0064	0.0069	0.0075	0.0082	0.0093	0.0099
5			0.0032	0.0036	0.0043	0.0043	0.0049	0.0054	0.0058	0.0063	0.0069	0.0078	0.0084
6				0.0032	0.0038	0.0037	0.0043	0.0047	0.0051	0.0056	0.0061	0.0069	0.0074
7						0.0034	0.0039	0.0043	0.0046	0.0050	0.0055	0.0062	0.0067
8						0.0031	0.0036	0.0039	0.0043	0.0046	0.0051	0.0057	0.0061
9								0.0037	0.0040	0.0043	0.0047	0.0053	0.0057
10								0.0034	0.0037	0.0040	0.0044	0.0050	0.0054
11									0.0035	0.0038	0.0042	0.0047	0.0051
12									0.0034	0.0036	0.0040	0.0045	0.0048
13										0.0035	0.0038	0.0043	0.0046
14										0.0033	0.0037	0.0041	0.0044
15											0.0035	0.0040	0.0043
16													0.0041
T Ap (in)	0.012	0.018	0.024	0.030	0.036	0.042	0.048	0.060	0.072	0.085	0.097	0.109	0.121

NOTE: Always allow .003–.005" extra stock for full profile inserts.

Metric ISO, Internal Thread Cutting

thread pitch P (mm)	0.50	0.75	1.00	1.25	1.50	1.75	2.00	2.50	3.00	3.50	4.00	4.50	5.00
T Ap	0.011	0.016	0.021	0.027	0.032	0.037	0.043	0.053	0.064	0.075	0.085	0.096	0.107
N Ap	4	4	5	6	6	8	8	10	11	12	14	15	16
	values for flank infeed (X/Z)												
order of passes	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z
1	0.0035	0.0051	0.0058	0.0066	0.0078	0.0077	0.0089	0.0097	0.0111	0.0124	0.0129	0.0141	0.0151
2	0.0029	0.0042	0.0047	0.0055	0.0065	0.0063	0.0074	0.0080	0.0092	0.0102	0.0107	0.0116	0.0125
3	0.0026	0.0038	0.0043	0.0050	0.0059	0.0058	0.0067	0.0073	0.0084	0.0094	0.0098	0.0106	0.0114
4	0.0020	0.0029	0.0033	0.0038	0.0045	0.0044	0.0052	0.0056	0.0064	0.0072	0.0075	0.0082	0.0088
5			0.0028	0.0032	0.0038	0.0037	0.0044	0.0047	0.0054	0.0061	0.0063	0.0069	0.0074
6				0.0029	0.0034	0.0033	0.0038	0.0042	0.0048	0.0053	0.0056	0.0061	0.0065
7						0.0030	0.0035	0.0038	0.0043	0.0048	0.0050	0.0055	0.0059
8						0.0027	0.0032	0.0035	0.0040	0.0044	0.0046	0.0050	0.0054
9								0.0032	0.0037	0.0041	0.0043	0.0047	0.0050
10								0.0030	0.0035	0.0039	0.0040	0.0044	0.0047
11									0.0033	0.0037	0.0038	0.0042	0.0045
12										0.0035	0.0036	0.0040	0.0043
13											0.0035	0.0038	0.0041
14											0.0033	0.0036	0.0039
15												0.0035	0.0038
16													0.0036
T Ap	0.011	0.016	0.021	0.027	0.032	0.037	0.043	0.053	0.064	0.075	0.085	0.096	0.107

NOTE: Always allow .003–.005" extra stock for full profile inserts.

UN Thread, External Thread Cutting

TPI	24	20	18	16	14	12	11	10	9	8	7	6	5
T Ap (in)	0.026	0.031	0.034	0.038	0.036	0.042	0.048	0.060	0.072	0.085	0.097	0.109	0.121
N Ap	5	6	6	7	9	9	10	11	12	13	14	15	16
	values for flank infeed (X/Z)												
order of passes	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z
1	0.0071	0.0076	0.0083	0.0085	0.0070	0.0081	0.0088	0.0104	0.0119	0.0134	0.0147	0.0160	0.0171
2	0.0059	0.0063	0.0069	0.0070	0.0058	0.0067	0.0072	0.0086	0.0098	0.0111	0.0122	0.0132	0.0141
3	0.0054	0.0057	0.0063	0.0064	0.0053	0.0062	0.0066	0.0079	0.0090	0.0102	0.0111	0.0121	0.0129
4	0.0041	0.0044	0.0048	0.0049	0.0040	0.0047	0.0051	0.0060	0.0069	0.0078	0.0086	0.0093	0.0099
5	0.0035	0.0037	0.0041	0.0042	0.0034	0.0040	0.0043	0.0051	0.0058	0.0066	0.0072	0.0078	0.0084
6		0.0033	0.0036	0.0037	0.0030	0.0035	0.0038	0.0045	0.0051	0.0058	0.0064	0.0069	0.0074
7				0.0033	0.0027	0.0032	0.0034	0.0040	0.0046	0.0052	0.0057	0.0062	0.0067
8					0.0025	0.0029	0.0031	0.0037	0.0043	0.0048	0.0053	0.0057	0.0061
9					0.0023	0.0027	0.0029	0.0035	0.0040	0.0045	0.0049	0.0053	0.0057
10							0.0027	0.0033	0.0037	0.0042	0.0046	0.0050	0.0054
11								0.0031	0.0035	0.0040	0.0044	0.0047	0.0051
12									0.0034	0.0038	0.0042	0.0045	0.0048
13										0.0036	0.0040	0.0043	0.0046
14											0.0038	0.0041	0.0044
15												0.0040	0.0043
16													0.0041
T Ap (in)	0.026	0.031	0.034	0.038	0.036	0.042	0.048	0.060	0.072	0.085	0.097	0.109	0.121

NOTE: Always allow .003–.005" extra stock for full profile inserts.

UN Thread, Internal Thread Cutting

TPI	24	20	18	16	14	12	11	10	9	8	7	6	5
T Ap	.023	.027	.030	.034	.039	.045	.049	.054	.060	.068	.077	.090	.108
N Ap	5	6	6	7	8	9	9	10	11	12	13	14	15
	values for flank infeed (X/Z)												
order of passes	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z
1	0.0063	0.0066	0.0073	0.0076	0.0081	0.0087	0.0095	0.0099	0.0104	0.0112	0.0122	0.0137	0.0158
2	0.0052	0.0055	0.0061	0.0063	0.0067	0.0072	0.0078	0.0081	0.0086	0.0093	0.0101	0.0113	0.0131
3	0.0048	0.0050	0.0056	0.0057	0.0061	0.0066	0.0072	0.0075	0.0079	0.0085	0.0092	0.0103	0.0120
4	0.0037	0.0038	0.0043	0.0044	0.0047	0.0051	0.0055	0.0057	0.0060	0.0065	0.0071	0.0079	0.0092
5	0.0031	0.0032	0.0036	0.0037	0.0039	0.0043	0.0046	0.0048	0.0051	0.0055	0.0060	0.0067	0.0077
6		0.0029	0.0032	0.0033	0.0035	0.0038	0.0041	0.0042	0.0045	0.0048	0.0052	0.0059	0.0068
7				0.0030	0.0031	0.0034	0.0037	0.0038	0.0040	0.0044	0.0047	0.0053	0.0062
8					0.0029	0.0031	0.0034	0.0035	0.0037	0.0040	0.0044	0.0049	0.0057
9						0.0029	0.0032	0.0033	0.0035	0.0037	0.0041	0.0046	0.0053
10								0.0031	0.0033	0.0035	0.0038	0.0043	0.0050
11									0.0031	0.0033	0.0036	0.0041	0.0047
12										0.0032	0.0034	0.0039	0.0045
13											0.0033	0.0037	0.0043
14											0.0031	0.0035	0.0041
15													0.0039
16													
T Ap	0.023	0.027	0.030	0.034	0.039	0.045	0.049	0.054	0.060	0.068	0.080	0.090	0.108

NOTE: Always allow .003–.005" extra stock for full profile inserts.

NPT Thread, External, and Internal Machining

TPI	27	18	14	11.5	8
T Ap	0.030	0.044	0.056	0.068	0.098
N Ap	6	8	10	12	14
	values for flank infeed (X/Z)				
order of passes	X/Z	X/Z	X/Z	X/Z	X/Z
1	0.0073	0.0091	0.0102	0.0112	0.0149
2	0.0061	0.0075	0.0084	0.0093	0.0123
3	0.0056	0.0069	0.0077	0.0085	0.0113
4	0.0043	0.0053	0.0059	0.0065	0.0086
5	0.0036	0.0045	0.0050	0.0055	0.0073
6	0.0032	0.0039	0.0044	0.0048	0.0064
7		0.0035	0.0040	0.0044	0.0058
8		0.0033	0.0037	0.0040	0.0053
9			0.0034	0.0037	0.0050
10			0.0032	0.0035	0.0047
11				0.0033	0.0044
12				0.0032	0.0042
13					0.0040
14					0.0038
15					
16					
T Ap	0.030	0.044	0.056	0.068	0.098

BSPT Thread, External, and Internal Machining

TPI	28	19	14	11
T Ap	0.023	0.034	0.046	0.057
N Ap	5	8	10	12
	values for flank infeed (X/Z)			
order of passes	X/Z	X/Z	X/Z	X/Z
1	0.0063	0.0070	0.0084	0.0094
2	0.0052	0.0058	0.0069	0.0078
3	0.0048	0.0053	0.0064	0.0071
4	0.0037	0.0041	0.0049	0.0055
5	0.0031	0.0034	0.0041	0.0046
6		0.0030	0.0036	0.0041
7		0.0027	0.0033	0.0037
8		0.0025	0.0030	0.0034
9			0.0028	0.0031
10			0.0026	0.0029
11				0.0028
12				0.0027
13				
14				
15				
16				
T Ap	0.023	0.034	0.046	0.057

NOTE: Always allow .003–.005" extra stock for full profile inserts.

Trapezoid Thread to DIN 103, External, and Internal Machining

pitch	1.50	2.00	3.00	4.00	5.00
T Ap	0.040	0.049	0.069	0.089	0.108
N Ap	6	8	10	12	14
	values for flank infeed (X/Z)				
order of passes	X/Z	X/Z	X/Z	X/Z	X/Z
1	0.0098	0.0101	0.0126	0.0147	0.0164
2	0.0081	0.0084	0.0104	0.0121	0.0135
3	0.0074	0.0077	0.0095	0.0111	0.0124
4	0.0057	0.0059	0.0073	0.0085	0.0095
5	0.0048	0.0050	0.0062	0.0072	0.0080
6	0.0042	0.0044	0.0054	0.0063	0.0071
7		0.0040	0.0049	0.0057	0.0064
8		0.0036	0.0045	0.0053	0.0059
9			0.0042	0.0049	0.0055
10			0.0039	0.0046	0.0051
11				0.0044	0.0049
12				0.0041	0.0046
13					0.0044
14					0.0042
15					
16					
T Ap	0.040	0.049	0.069	0.089	0.108

Round Thread to DIN 405, External, and Internal Machining

pitch	10	8	6
T Ap	0.052	0.064	0.085
N Ap	8	10	12
	values for flank infeed (X/Z)		
order of passes	X/Z	X/Z	X/Z
1	0.0108	0.0117	0.0140
2	0.0089	0.0096	0.0116
3	0.0081	0.0088	0.0106
4	0.0062	0.0068	0.0081
5	0.0053	0.0057	0.0069
6	0.0046	0.0050	0.0061
7	0.0042	0.0046	0.0055
8	0.0039	0.0042	0.0050
9		0.0039	0.0047
10		0.0037	0.0044
11			0.0042
12			0.0040
13			
14			
15			
16			
T Ap	0.052	0.064	0.085

NOTE: Always allow .003–.005" extra stock for full profile inserts.

Whitworth, External, and Internal Thread Cutting

TPI	28	20	19	16	14	12	11	10	9	8	7	6	5
T Ap	0.023	0.032	0.032	0.034	0.040	0.053	0.058	0.064	0.071	0.080	0.091	0.107	0.128
N Ap	5	6	6	8	8	9	9	10	11	12	14	15	16
	values for flank infeed (X/Z)												
order of passes	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z
1	0.0063	0.0078	0.0078	0.0070	0.0083	0.0103	0.0112	0.0117	0.0123	0.0132	0.0138	0.0157	0.0181
2	0.0052	0.0065	0.0065	0.0058	0.0068	0.0085	0.0093	0.0096	0.0102	0.0109	0.0114	0.0129	0.0149
3	0.0048	0.0059	0.0059	0.0053	0.0063	0.0078	0.0085	0.0088	0.0093	0.0100	0.0105	0.0118	0.0137
4	0.0037	0.0045	0.0045	0.0041	0.0048	0.0060	0.0065	0.0068	0.0071	0.0077	0.0080	0.0091	0.0105
5	0.0031	0.0038	0.0038	0.0034	0.0041	0.0050	0.0055	0.0057	0.0060	0.0065	0.0068	0.0077	0.0089
6		0.0034	0.0034	0.0030	0.0036	0.0044	0.0048	0.0050	0.0053	0.0057	0.0060	0.0068	0.0078
7				0.0027	0.0032	0.0040	0.0044	0.0046	0.0048	0.0051	0.0054	0.0061	0.0071
8				0.0025	0.0030	0.0037	0.0040	0.0042	0.0044	0.0047	0.0050	0.0056	0.0065
9						0.0034	0.0037	0.0039	0.0041	0.0044	0.0046	0.0052	0.0060
10								0.0037	0.0039	0.0041	0.0043	0.0049	0.0057
11									0.0036	0.0039	0.0041	0.0046	0.0054
12										0.0037	0.0039	0.0044	0.0051
13											0.0037	0.0042	0.0049
14											0.0036	0.0040	0.0047
15												0.0039	0.0045
16													0.0043
T Ap	0.023	0.032	0.032	0.034	0.040	0.053	0.058	0.064	0.071	0.080	0.091	0.107	0.128

NOTE: Always allow .003–.005" extra stock for full profile inserts.

Multi-Tooth Threads, Internal

	ISO metric						ISO UN					Whitworth	NPT		
type	3M	2M	3M	2M	3M	2M	2M	3M	2M	3M	2M	2M	2M	3M	2M
pitch (mm)	1.0	1.5	1.5	2.0	2.0	3.0	—	—	—	—	—	—	—	—	—
TPI	—	—	—	—	—	—	16	16	12	12	8	11	11.5	11.5	8
total depth	.024	.033	.033	.460	.460	.070	.037	.037	.490	.490	.740	.620	.690	.690	.100
1	.013	.015	.020	.020	.028	.022	.017	.022	.022	.030	.023	.029	.023	.032	.035
2	.011	.010	.013	.015	.018	.019	.012	.015	.016	.019	.020	.019	.020	.022	.025
3	—	.008	—	.011	—	.017	.008	—	.011	—	.017	.014	.014	.015	.022
4	—	—	—	—	—	.012	—	—	—	—	.014	—	.012	—	.018

Recommendations for Steel Workpieces (<300 BHN)

			total depth — on radius		
catalog number	insert size	TPI profile	1st pass	2nd pass	3rd pass
NTC-8R/L8EM	8	8 UN	.048	.064	.079
NTC-8R/L8IM	8	8 UN	.047	.061	.074
NTC-8R/L10EM	8	10 UN	.036	.050	.063
NTC-8R/L10IM	8	10 UN	.035	.048	.060
NTC-8R/L12EM	8	12 UN	.030	.041	.052
NTC-8R/L12IM	8	12 UN	.030	.037	.047
NTC-8R/L14EM	8	14 UN	.027	.037	.044
NTC-8R/L14IM	8	14 UN	.024	.031	.041
NTC-8R/L16EM 8	8	16 UN	.023	.032	.038
NTC-8R/L16IM	8	16 UN	.020	.027	.037
NTC-8R/L18EM	8	18 UN	.019	.026	.034
NTC-8R/L18IM	8	18 UN	.019	.024	.033
NDC-68RDR/L-75M	8	8 round	.058	.065	.073
NDC-61RDR/L-75M	8	10 round	.044	.051	.057
NDC-88RDRD/L-75M	8	8 round	.051	.069	.073
NDC-88VR/L-75M	8	8 NPT	.040	.068	.096
NDC-8115VR/L-75M	8	11.5 NPT	.038	.054	.067
NDN-814VR/L-75M	8	14 NPT	.038	.054	.054

NOTE: Always allow .003–.005" extra stock for full profile inserts.

ACME, External

pitch, TPI	28	20	19	16	14	12	11	10	9	8	7	6	5
depth	.028	.032	.032	.034	.040	.053	.058	.064	.071	.080	.091	.107	0.128
number of passes	5	6	6	8	8	9	9	10	11	12	14	15	16
	values for flank infeed (X/Z)												
order of passes	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z
1	.039	.041	.050	.063	.074	.095	.112	.138	.180	.256	.008/-	.008/-	.008/-
2	.009	.008	.009	.010	.010	.011	.012	.013	.019	.028	.013/.007	.014/.007	.017/.009
3	.009	.008	.009	.009	.010	.011	.011	.012	.018	.026	.01/.005	.011/.006	.013/.007
4	.007	.007	.007	.009	.009	.010	.010	.011	.016	.023	.008/.004	.009/.005	.011/.006
5	.006	.006	.007	.007	.007	.009	.010	.011	.015	.022	.007/.004	.008/.004	.009/.005
6	.005	.005	.005	.006	.006	.008	.009	.010	.013	.019	.007/.003	.007/.004	.009/.004
7	.003	.004	.005	.005	.005	.007	.008	.010	.011	.017	.006/.003	.007/.004	.008/.004
8		.003	.004	.005	.005	.006	.007	.009	.011	.015	.006/.003	.006/.003	.007/.004
9			.004	.004	.005	.006	.007	.008	.009	.013	.005/.003	.006/.003	.007/.004
10				.004	.005	.006	.007	.008	.009	.013	.005/.003	.005/.003	.006/.003
11				.004	.004	.006	.006	.007	.009	.011	.005/.002	.005/.003	.006/.003
12					.004	.006	.006	.007	.008	.011	.004/.002	.005/.003	.006/.003
13					.004	.005	.006	.006	.007	.010	.004/.002	.005/.003	.006/.003
14						.004	.005	.006	.007	.009	.004/.002	.005/.002	.005/.003
15							.004	.006	.007	.009		.005/.002	.005/.003
16							.004	.006	.006	.008			.005/.003
17								.004	.005	.007	.004/.002	.005/.003	.006/.003
18								.004	.005	.007	.004/.002	.005/.002	.005/.003
19									.005	.006		.005/.002	.005/.003
20										.006			.005/.003

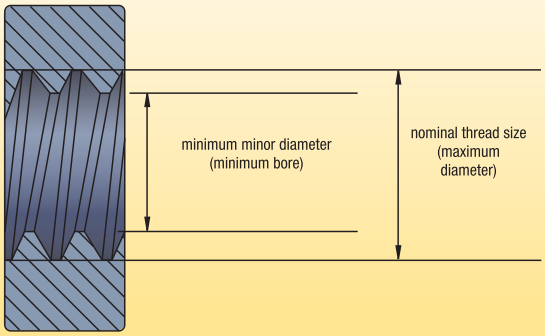
NOTE: Always allow .003–.005" extra stock for full profile inserts.

ACME, Internal

pitch, TPI	28	20	19	16	14	12	11	10	9	8	7	6	5
depth	.028	.032	.032	.034	.040	.053	.058	.064	.071	.080	.091	.107	0.128
number of passes	5	6	6	8	8	9	9	10	11	12	14	15	16
	values for flank infeed (X/Z)												
order of passes	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z
1	.039	.041	.050	.063	.074	.095	.112	.138	.180	.256	.008/-	.008/-	.008/-
2	.009	.008	.009	.010	.010	.011	.012	.013	.019	.028	.013/.007	.014/.007	.017/.009
3	.009	.008	.009	.009	.010	.011	.011	.012	.018	.026	.01/.005	.011/.006	.013/.007
4	.007	.007	.007	.009	.009	.010	.010	.011	.016	.023	.008/.004	.009/.005	.011/.006
5	.006	.006	.007	.007	.007	.009	.010	.011	.015	.022	.007/.004	.008/.004	.009/.005
6	.005	.005	.005	.006	.006	.008	.009	.010	.013	.019	.007/.003	.007/.004	.009/.004
7	.003	.004	.005	.005	.005	.007	.008	.010	.011	.017	.006/.003	.007/.004	.008/.004
8		.003	.004	.005	.005	.006	.007	.009	.011	.015	.006/.003	.006/.003	.007/.004
9			.004	.004	.005	.006	.007	.008	.009	.013	.005/.003	.006/.003	.007/.004
10				.004	.005	.006	.007	.008	.009	.013	.005/.003	.005/.003	.006/.003
11				.004	.004	.006	.006	.007	.009	.011	.005/.002	.005/.003	.006/.003
12					.004	.006	.006	.007	.008	.011	.004/.002	.005/.003	.006/.003
13					.004	.005	.006	.006	.007	.010	.004/.002	.005/.003	.006/.003
14						.004	.005	.006	.007	.009	.004/.002	.005/.002	.005/.003
15							.004	.006	.007	.009		.005/.002	.005/.003
16							.004	.006	.006	.008			.005/.003
17								.004	.005	.007	.004/.002	.005/.003	.006/.003
18								.004	.005	.007	.004/.002	.005/.002	.005/.003
19									.005	.006		.005/.002	.005/.003
20										.006			.005/.003

NOTE: Always allow .003–.005" extra stock for full profile inserts.

The following charts list the largest thread pitch that can be applied on internal applications using Top Notch threading inserts for 60° V-threading and Acme threading.



Inch-Sized 60° V-Threading Limits
internal threading limitations
NT-1, NT-2 V-threading inserts

TPI	nominal thread size		minimum minor diameter (inch)	
	NT-1	NT-2	NT-1	NT-2
6	1-7/8	—	1.695	—
7	1-3/4	—	1.595	—
8	1-5/8	—	1.490	—
9	1-9/16	—	1.442	—
10	1-1/2	15/16	1.392	.830
11	1-7/16	15/16	1.339	.830
11-1/2	1-3/8	15/16	1.281	.830
12	1-3/8	9/16	1.285	.472
13	1-5/16	9/16	1.229	.472
14	1-1/4	9/16	1.173	.472
16	1-1/4	9/16	1.182	.472
18	1-1/8	9/16	1.065	.472
20	1-1/8	1/2	1.071	.440
24*	1-1/16	1/2	1.017	.440

*Twenty-four threads per inch and finer can be cut with an NT-2 insert provided the minor diameter is 1.000" or larger (.440" or larger with NT-1).

internal threading limitations
NT-3 and- 4 V-threading inserts

TPI	nominal thread size	minimum minor diameter (inch)
4**	3	2.729
4-1/2**	2-7/8	2.634
5	2-3/4	2.534
6	2-1/2	2.320
7	2-1/4	2.095
8	2	1.865
9	1-15/16	1.817
10	1-7/8	1.767
11	1-13/16	1.714
11-1/12	1-3/4	1.656
12	1-3/4	1.660
13	1-5/8	1.542
14	1-9/16	1.485
16*	1-7/16	1.370

*Sixteen threads per inch and finer can be cut provided minor diameter is 1.370" or larger.
**NT-4 insert only.

Metric-sized 60° V-Threading Limits
internal threading limitations
NT-1, NT-2 60° V-threading inserts

TPI	nominal thread size		minimum thread diameter (inch)	
	NT-1	NT-2	NT-1	NT-2
4,00	M48 x 4.00	–	43,67	–
3,00	M42 x 3.00	–	38,75	–
2,50	M39 x 2.50	M24 x 2,50	36,29	21,29
2,00	M33 x 2.00	M15 x 2,00	30,84	12,84
1,75	M32 x 1.75	M15 x 1,75	30,11	13,11
1,50	M32 x 1.50	M15 x 1,50	30,38	13,38
1,25	M29 x 1.29	M14 x 1,25	27,65	12,65
1,00*	M27 x 1.00	M14 x 1,00	25,92	12,92
0,75	M22 x 0.75	M12 x 0,75	21,19	11,19

*Thread pitch of 1mm and less can be cut with an NT-2 insert provided the core thread diameter is 25mm or larger (11mm or larger with NT-1).

internal threading limitations
NT-3 and NT-4 60° V-threading inserts

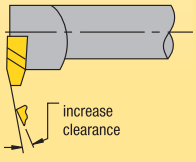
TPI	nominal thread size	minimum thread diameter (inch)
6,00**	M76 x 6.00	69,50
5,50**	M73 x 5.50	67,05
5,00	M70 x 5.00	64,59
4,00	M64 x 4.00	59,67
3,00	M52 x 3.00	48,75
2,50	M48 x 2.50	45,29
2,00	M42 x 2.00	39,84
1,75	M40 x 1.75	38,11
1,50*	M38 x 1.50	36,38

*Thread pitch of 1,5mm and less can be cut provided core thread diameter is 35mm or larger.
**NT-4-insert only.

Acme Threading Limits
internal threading limitations
NA and NAS-2, -3, -4, and -6 Acme threading inserts

TPI	nominal thread size	minimum thread diameter (inch)	
	NT-1	NT-1	NT-2
2**	5	4.500	114.3
2-1/2**	4-1/2	4.100	104.1
3**	4	3.665	93.1
4	3-1/2	3.250	82.6
5	3	2.800	71.1
6	2-1/2	2.333	59.3
8	2-1/4	2.125	54.0
10	2	1.900	48.3
12	1-3/4	1.667	42.4
14	1-5/8	1.554	39.5
16*	1-1/2	1.438	36.5

*Sixteen threads per inch and finer can be cut provided minor diameter is 1.438" (36,5mm) or larger.
**NA-6 insert only.



Additional secondary clearance can be ground on leading edge of insert to provide sufficient helical clearance for machining coarser threads and multiple start threads. Modified standard inserts may be furnished for machining threads outside of the limits shown.

Beyond™ Top Notch™ Profiling

The Top Notch system is the proven solution for high productivity. The Top Notch system provides consistent tool performance, accurate indexing, and superior clamping to provide excellent surface finishing and superior tool life.

FEATURES AND BENEFITS

Higher Productivity and Profitability

- Lower cutting forces increase speeds and reduce cycle time.
- Extended tool life.

Reliability

- Predictable tool life/uniform wear.
- Resists chip flow damage.
- Consistent surface finish.

Versatility

- Products can be applied across a wide range of applications.
- Use in low- to high-speed applications.
- Complete portfolio of products.
- For finish to rough turning of steel, cast iron, stainless steel, and high-temp alloys.

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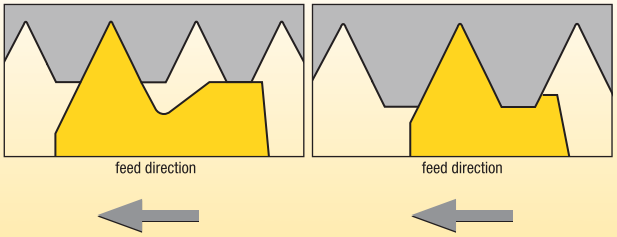
60° V-Thread Crest Turning Application Data



NTC crest turning insert for 12 threads per inch and finer (P ≤ 2mm).

NTC crest turning insert for 11 threads per inch and coarser (P ≥ 3mm).

NOTE: NTC inserts automatically control root to crest dimensions. Therefore, in setting up threading operations with NTC inserts, check the O.D. or I.D. at the thread crest for correct dimensions.

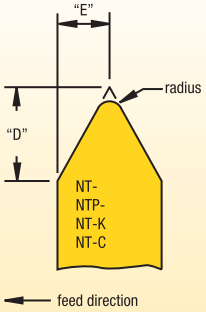
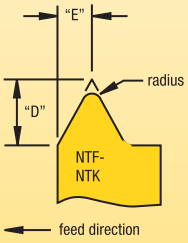
60° V-Thread Crest Turning Application Data

insert catalog number	nose radius on insert (inch)	thread radius per MIL-S-8879A (inch)
NJ-3014R/L12	.0125/.0135	.0125/.0150
NJK-3008R/L20	.0075/.0085	.0075/.0090

"J" thread note for catalog

The controlled root radius thread form (SAE8879C) is defined for the external thread only. To machine the corresponding internal thread, choose any insert that will cut a unified class 2B thread, then bore the minor diameter to size. Refer to SAE8879C and MIL-S-8879C and SAEAS8879D for the correct "J" thread minor diameter values.

60° V-Thread Application Data

insert description	insert	D** (inch)	E** (inch)	recommended TPI*		recommended TP*	
				external	internal	external	internal
	NT-1	.075	.044	–	24–12	–	1,00–2,00
	NT-2	.113	.075	36–8	20–7	0,70–3,00	1,25–3,50
	NT-2-K	.113	.075	36–8	20–7	0,70–3,00	1,25–3,50
	NTF-2	.062	.040	44–14	24–12	0,60–1,75	1,00–2,00
	NTK-2	.062	.040	44–14	24–12	0,60–1,75	1,00–2,00
	NTP-2	.113	.075	36–8	20–7	0,70–3,00	1,25–3,50
	NT-3	.148	.097	20–6	12–5	1,25–4,00	2,00–5,00
	NT-3-K	.148	.097	20–6	12–5	1,25–4,00	2,00–5,00
	NT-3-C	.148	.097	11–6	6 (only)	2,50–4,00	4,00 (only)
	NT-3-CK	.148	.097	11–6	6 (only)	2,50–4,00	4,00 (only)
	NTF-3	.083	.054	44–10	24–9	0,60–2,50	1,00–2,50
	NTK-3	.083	.054	44–10	24–9	0,60–2,50	1,00–2,50
	NTP-3	.148	.097	20–6	12–5	1,25–4,00	2,00–5,00
	NT-4	.196	.127	20–4	12–4	1,25–6,25	2,00–6,25
	NT-4-K	.196	.127	20–4	12–4	1,25–6,25	2,00–6,25
	NTP-4	.196	.127	20–4	12–4	1,25–6,25	2,00–6,25

*Based on maximum insert radius size and class 2A and 2B thread specifications.
**For metric D and E dimensions, multiply by 25,4.

API Thread Forms • Insert Applications Chart for API Rotary Shouldered Connections

thread form	Kennametal insert		tool joint application	minimum box size*
	cresting	non-cresting		
V-.038R 2" TPF 4 TPI	NDC-4038R/L2 4-E/IR4API382	ND-3038R/L	2-3/8 API internal flush 2-7/8 API internal flush 3-1/2 API internal flush 4 API internal flush 4-1/2 API internal flush 5-1/2 API internal flush 6-5/8 API internal flush 4 API full hole API #23, API #26, API #31, API #35, API #38, API #40, API #44, API #46, API #50	API #31 2-7/8 IF
V-.038R 3" TPF 4 TPI	NDC-4038R/L3 4-E/IR4API383	ND-3038R/L	API #56 API #61 API #70 API #77	API #56
V-.050 2" TPF 4 TPI	NDC-4050R/L2 4-E/IRAPI502	ND-4050R/L	5-1/2 API full hole 6-5/8 API regular 6-5/8 API full hole	5-1/2 API full hole
V-.050 3" TPF 4 TPI	NDC-4050R/L3 4-E/IR4API503	ND-4050R/L	5-1/2 API regular 7-5/8 API regular 8-5/8 API regular	5-1/2 API regular
V-.040 3" TPF 5 TPI	NDC-3040R/L3 NDC-4040R/L3 4-E/IR5API403	ND-3040R/L ND-4040R/L	2-3/8 API regular 2-7/8 API regular 3-1/2 API regular 4-1/2 API regular	3-1/2 API regular

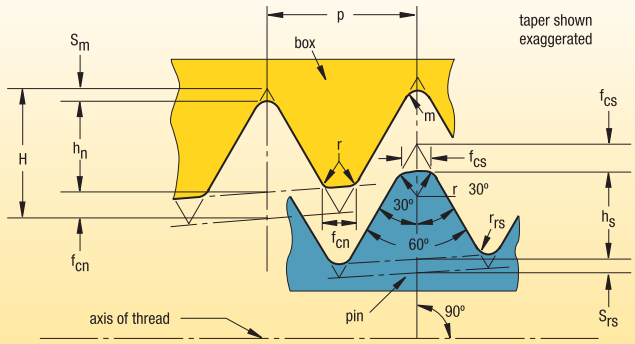
*Minimum box size that can be threaded with a standard Top Notch insert due to minimum bore equipment.

API Thread Forms
Product Thread Dimensions • Rotary Shouldered Connections (Inch)

thread form	taper inch per ft.	thread height, not truncated H	thread height, truncated $h_n=h_s$	root truncation $S_m=S_{rs}$ $f_m=f_{rs}$	crest truncation $f_{cn}=f_{cs}$	width of flat		root radius $r_m=r_{rs}$	radius at thread corners r	pitch p
						crest $f_{cn}=f_{cs}$	crest $f_m=f_{rs}$			
V-.038R	2	.216005	.121844	.038000	.056161	.065	—	.038	.015	.250
V-.038R	3	.215379	.121381	.038000	.055998	.065	—	.038	.015	
V-.040	3	.172303	.117842	.020000	.034461	.040	—	.020	.015	.250
V-.050	3	.215379	.147303	.025000	.043076	.050	—	.025	.015	
V-.050	2	.216005	.147804	.025000	.043201	.050	—	.025	.015	.250

NOTE: All dimensions in inches.

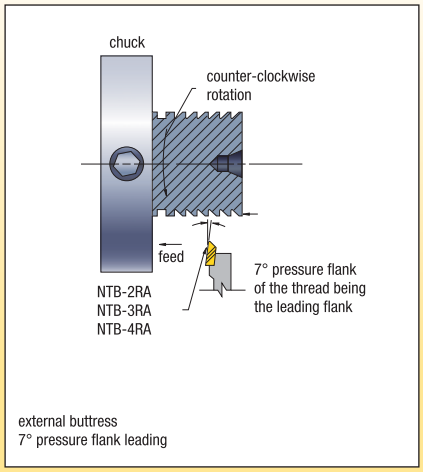
V-.040 and V-.050 Product Thread Form

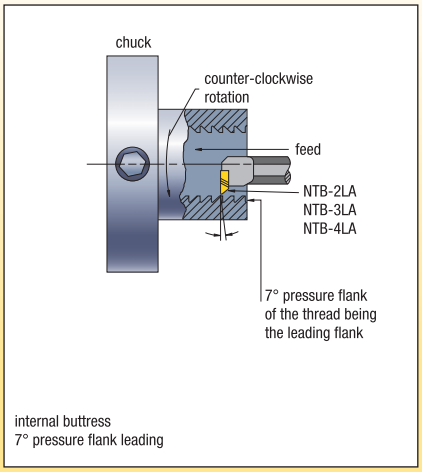


Casing and Tubing Round Thread (Height Dimensions)

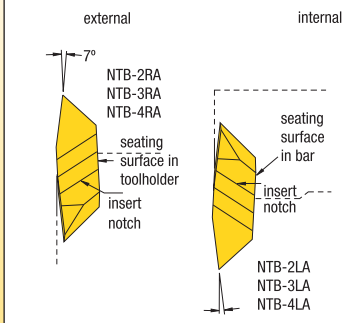
thread element		10 TPI p= .1000	8 TPI p= .1250
H	= .866p	.08660	.10825
$H_s = h_n$	= .626p - .007	.05560	.07125
$S_{rs} = S_m$	= .120p + .002	.01400	.01700
$S_{cs} = S_{cn}$	= .120p + .005	.01700	.02000

American Buttress (7° Pressure Flank Leading) NTB-A Inserts • Push Type

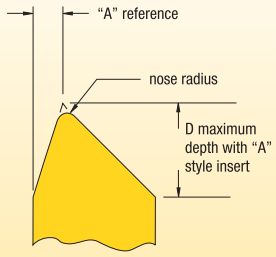




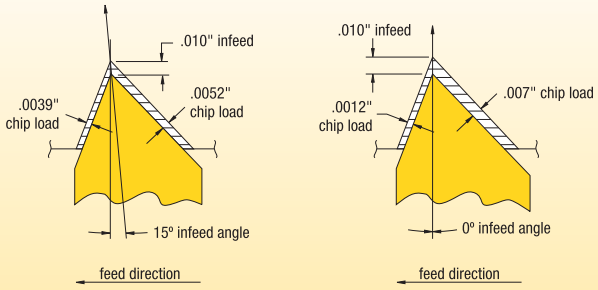
Insert vs. Toolholder Orientation



Reference Dimensions



Infeed Angle vs. Chip Load: 7° Pressure Flank Leading



NTB-A insert

insert	D (inch)	"A" ref. (inch)	nose radius (inch)	pitch based on maximum radius
NTB-2A	.133	.024	.002–.004	16–20 TPI
NTB-3A	.171	.031	.005–.008	8–16 TPI
NTB-4A	.218	.049	.008–.012	4–6 TPI

NOTE: For balanced chip load, 15° infeed angle is suggested.

Internal Threading Limitations

internal threading limitations
NTB-2A Buttress threading inserts

TPI	nominal thread size	minimum minor diameter (inch)
8	1-3/4	1.600
10	1-5/8	1.505
12	1-1/2	1.400
16	1-1/4	1.175
20	1-1/16	1.002

internal threading limitations
NTB-3 and NTB-4A Buttress threading inserts

TPI	nominal thread size	minimum minor diameter (inch)
4*	2-1/2	2.200
5	2-1/4	2.010
6	2	1.800
8	1-3/4	1.600
10	1-5/8	1.505
12**	1-1/2	1.400

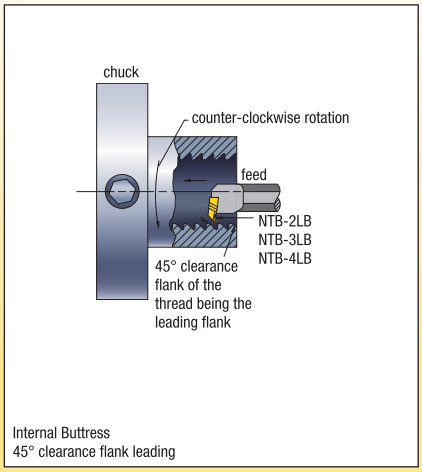
*NTB-4A insert only.
**Can cut 16 or 20 threads per inch provided minor diameter is 1.375" or larger.

Threads per Inch vs. Maximum Root Radius Chart (Inch)

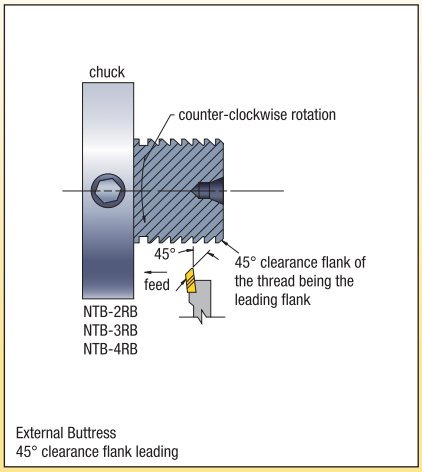
TPI	20	16	12	10	8	6	5	4	3	2-1/2	2	1-1/2	1-1/4	1
maximum root radius	.0036	.0045	.0059	.0071	.0089	.0119	.0143	.0179	.0238	.0268	.0375	.0476	.0572	.0714

NOTE: Special Buttress forms are available upon request.

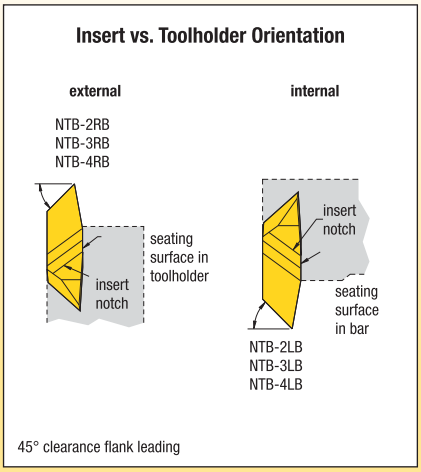
American Buttress (45° Clearance Flank Leading): NTB-B Inserts • PULL-type



Internal Buttress
45° clearance flank leading

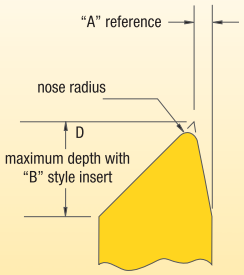


External Buttress
45° clearance flank leading

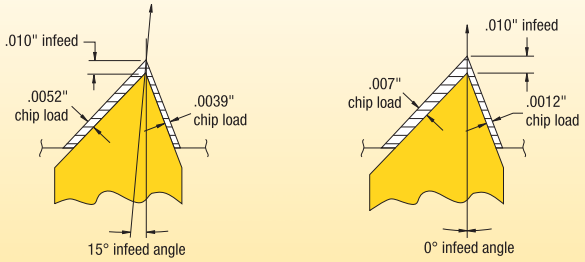


45° clearance flank leading

Reference Dimensions



Infeed Angle vs. Chip Load: 45° Clearance Flank Leading



NTB-B insert

insert	D (inch)	"A" reference (inch)	nose radius (inch)	pitch based on maximum radius
NTB-3B	.171	.031	.005–.004	8–16 TPI

NOTE: For balanced chip load, a reverse 15° infeed angle is suggested.

Internal Threading Limitations

internal threading limitations
NTB-2B Buttress threading inserts

TPI	nominal thread size	minimum minor diameter (inch)
8	1-3/4	1.600
10	1-5/8	1.505
12	1-1/2	1.400
16	1-1/4	1.175
20	1-1/16	1.002

internal threading limitations
NTB-3 and NTB-4B Buttress threading inserts

TPI	nominal thread size	minimum minor diameter (inch)
4*	2-7/8	2.575
5	2-3/4	2.510
6	2-3/8	2.175
8	2-1/8	1.975
10	1-7/8	1.755
12	1-5/8	1.525
16	1-1/2	1.407
20	1-7/16	1.378

*NTB-4B insert only.

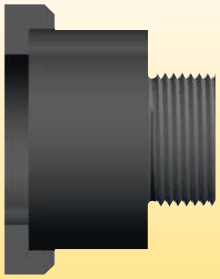
Required Information

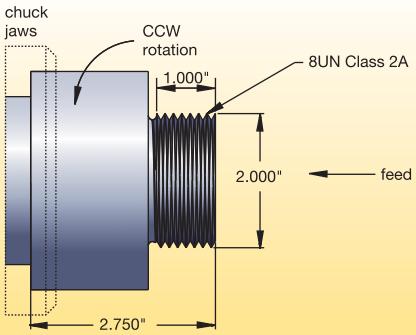
From Part Drawing:

material:	316SS, 200 HB
thread form:	8UN
tolerance:	class 2A
operation:	external threading
pitch diameter:	2.00" x 1.00" deep

From Machine Setup Data:

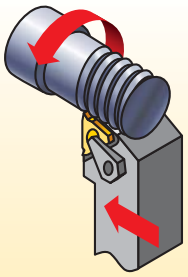
tooling:	.750" x .750"
spindle rotation:	counter-clockwise
feed:	toward chuck





Steps for a Successful Threading Operation

Step 1 • Determine Threading Method



Need to Know:

- Operation (external).
- Spindle rotation (CCW).
  Counter-clockwise rotation.
- Feed direction (toward chuck).
- Right-hand toolholder.
- Right-hand insert (ER).
- Standard helix method.

Step 2 • Select Insert

Need to Know:

- Thread form (8 UN Class 2A).
- Hand of insert (right hand — ER).

Choose the High-Performance Solution

catalog number	insert size	KCU25/ KC5025
3ER8UN	3"	•

High-Performance Selection

NOTE: Use insert with largest IC available.

insert:	3ER8UN
grade:	KCU25/KC5025
speed:	500 SFM

Step 3 • Select the Grade and Speed

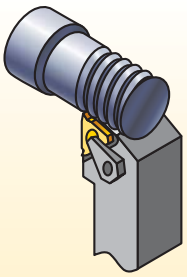
Need to Know:

- Workpiece material (316SS-200HB).
- Operation (external).

Options: Grade and Speed Selection Guidelines

threading operation	stainless steel
external	general purpose and high performance
	KC5025
	150–450 SFM

Step 4 • Select Toolholder



Need to Know:

- External or internal operation (external).
- Pitch diameter to determine minimum bore diameter (N/A).
- Type of tooling — toolholder, boring bar (toolholder).
- Hand of tool (right hand).
- Insert size (3/8").

Options:

catalog number	insert size	shim
LSASR-123	3"	SM-YE3

First choice: LSASR-123 holder

Step 5 • Select Shim

Need to Know:

- Thread form — TPI or pitch (8 TPI).
- Pitch diameter (2").
- Helix method (standard). See Laydown Threading (LT) shim selection chart.

Select SM-YE3 shim

NOTE: The SM-YE3 shim is supplied with the selected toolholder.

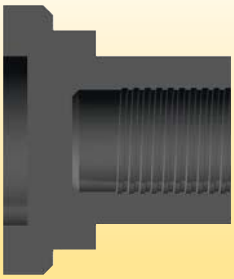
Required Information

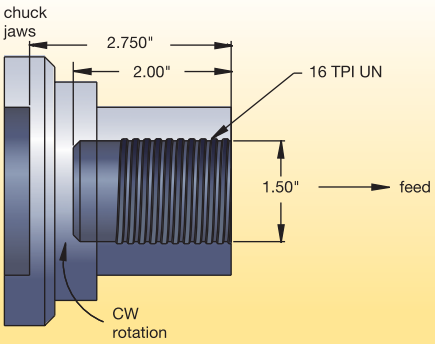
From Part Drawing:

material: 4140 steel
thread form: 16 TPI UN
tolerance: class 2B
operation: internal threading
pitch diameter: 1.5" x 2" deep

From Machine Setup Data:

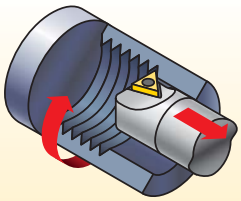
tooling: .075" boring bar
spindle rotation: clockwise
feed: away from chuck





Steps for a Successful Threading Operation

Step 1 • Determine Threading Method



Need to Know:

- Operation (internal).
- Spindle rotation (CW). *Clockwise rotation.*
- Feed direction (away from chuck).
- Left-hand toolholder.
- Left-hand insert (NL).
- Reverse helix method.

Step 2 • Select Insert

Need to Know:

- Thread form (16UN Class 2B).
- Hand of insert (left hand — NL).

Choose the High-Performance Solution

catalog number	insert size	KCU25/ KC5025
2ILA60	2"	•
3ILA60	3"	•

High-Performance Selection

NOTE: Use insert with largest possible IC to go into the bore.
insert: 3ILA60
grade: TN6025
speed: 450 SFM

Step 3 • Select the Grade and Speed

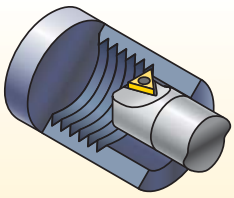
Need to Know:

- Workpiece material (4010 steel).
- Operation (internal).

Options: Grade and Speed Selection Guidelines

threading operation	steel
internal	general purpose and high performance
	KC5025
	100–550 SFM

Step 4 • Select Toolholder



Need to Know:

- External or internal operation (internal).
- Pitch diameter to determine minimum bore diameter for internal operations (1.5").
- Type of tooling — toolholder, boring bar (boring bar).
- Hand of tool (left hand).
- Insert size (3/8").

Options:

catalog number	insert size	minimum bore diameter	shim
S1212-LSEL3	3"	.90	SM-YE3
S0812-LSEL2	2"	.65	—

First choice: LSASR-123 holder

Step 5 • Select Shim

Need to Know:

- Thread form — TPI or pitch (8 TPI).
- Pitch diameter (2").
- Helix method (standard). See Laydown Threading (LT) shim selection chart.

Select SM-YE3 shim

NOTE: For this application, the standard shim supplied should be replaced with the recommended shim, SM-YE3-2N.

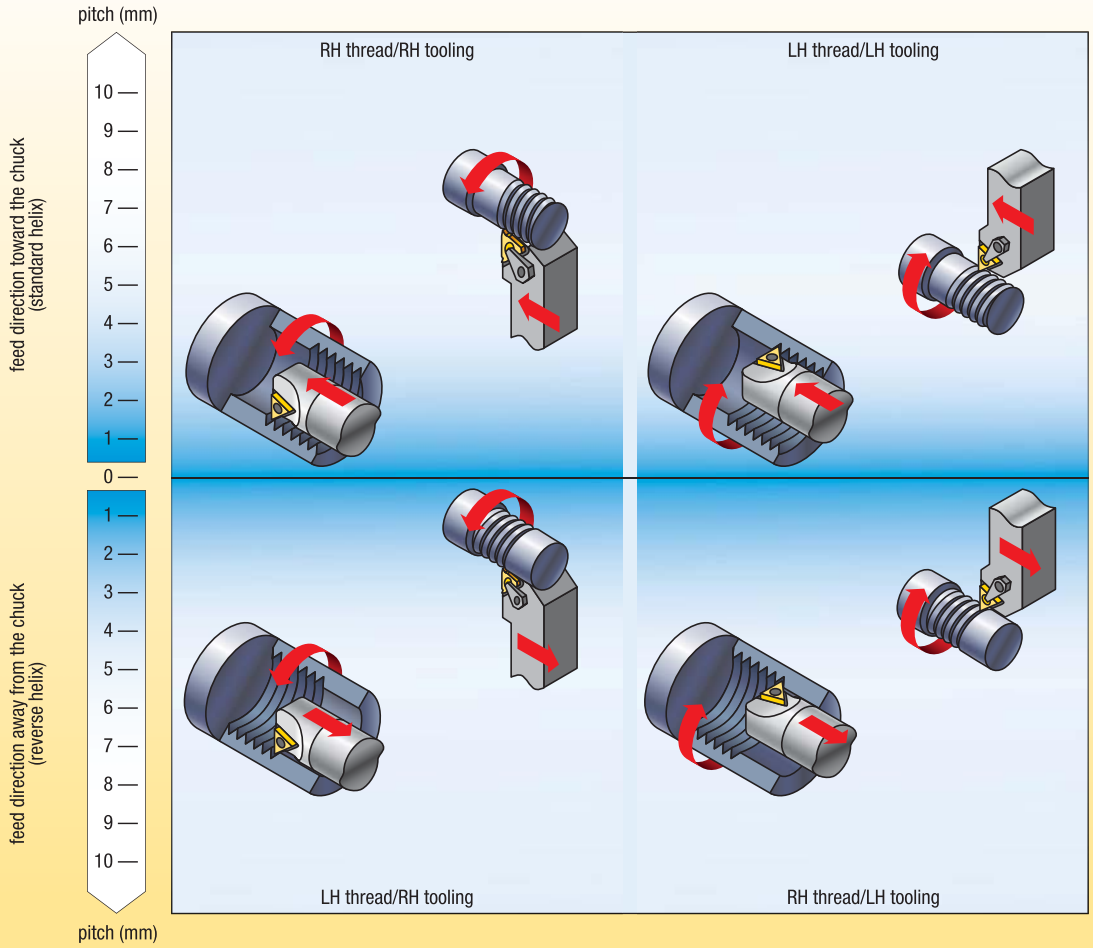
Laydown Threading Shim Selection Guidelines

It is essential to select the correct shim to ensure thread quality and maximum tool life. These parameters are needed:

- Pitch
- Pitch diameter
- Number of starts
- Feed direction

NOTE: When considering method of thread cutting, the part's shape and stability and the flow of chips are determining factors in your decision.

Laydown Selection Chart



NOTE: For multi-start threads, use the lead value instead of the pitch.

Diagram of Thread Lead Angles

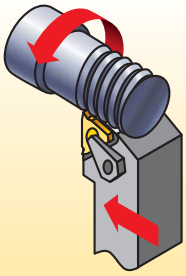
To calculate the lead angle of a given thread, use this formula:

$$ß = \text{Arctan} \frac{P \bullet S}{\pi D_e}$$

ß = thread lead angle
D_e = effective pitch diameter of thread wear
P = 1/TPI
TPI = threads per inch
S = number of starts
single-start, lead = pitch
multiple-start, lead = pitch (x) number of starts

All toolholders are designed with an inclination angle = 1.5°. When turning standard threads with a lead angle of 1–2°, this guarantees adequate clearance at the flanks of the insert's thread tooth. The thread lead angle and the required inclination angle of the insert are given by ß.

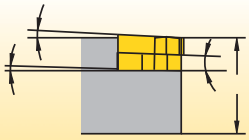
Cutting edge height is constant at every shim and insert combination. All toolholders are supplied with 1-1/2° lead angle.



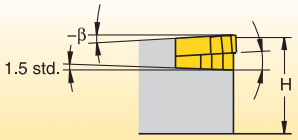
Laydown Threading Shim Selection Table • Inch

	toolholder		shim ordering code (inch)							
insert size	external	internal				standard				
3 (3/8")	RH	LH	SM–YE3–3P	SM–YE3–2P	SM–YE3–1P	SM–YE3	SM–YE3–1N	SM–YE3–1.5N	SM–YE3–2N	SM–YE3–3N
3 (3/8")	LH	RH	SM–YI3–3P	SM–YI3–2P	SM–YI3–1P	SM–YI3	SM–YI3–1N	SM–YI3–1.5N	SM–YI3–2N	SM–YI3–3N
4 (1/2")	RH	LH	SM–YE4–3P	SM–YE4–2P	SM–YE4–1P	SM–YE4	SM–YE4–1N	SM–YE4–1.5N	SM–YE4–2N	SM–YE4–3N
4 (1/2")	LH	RH	SM–YI4–3P	SM–YI4–2P	SM–YI4–1P	SM–YI4	SM–YI4–1N	SM–YI4–1.5N	SM–YI4–2N	SM–YI4–3N
TPI		pitch (mm)	pitch diameter (inch)							
72		–	–	–	–	0.12–0.31	0.32–0.84	>0.84	0.84–0.32	0.31–0.12
–		0,35	–	–	–	0.12–0.3	0.31–0.84	>0.84	0.84–0.31	0.3–0.12
64		–	–	–	–	0.14–0.35	0.36–0.95	>0.95	0.95–0.36	0.35–0.14
–		0,40	–	–	–	0.14–0.35	0.36–0.96	>0.96	0.96–0.36	0.35–0.14
56		0,45	–	–	–	0.16–0.4	0.41–1.09	>1.09	1.09–0.41	0.4–0.16
–		0,50	–	–	0.11–0.16	0.17–0.44	0.45–1.2	>1.20	1.2–0.45	0.44–0.17
48		–	–	–	0.12–0.17	0.18–0.46	0.47–1.27	>1.27	1.27–0.47	0.46–0.18
44		–	–	–	0.13–0.19	0.2–0.51	0.52–1.38	>1.38	1.38–0.52	0.51–0.2
–		0,60	–	0.1–0.12	0.13–0.2	0.21–0.53	0.54–1.44	>1.44	1.44–0.54	0.53–0.21
40		–	–	0.11–0.13	0.14–0.21	0.22–0.56	0.57–1.52	>1.52	1.52–0.57	0.56–0.22
–		0,70	–	0.12–0.15	0.16–0.23	0.24–0.62	0.63–1.68	>1.68	1.68–0.63	0.62–0.24
36		–	–	0.12–0.15	0.16–0.23	0.24–0.62	0.63–1.69	>1.69	1.69–0.63	0.62–0.24
–		0,75	0.11–0.12	0.13–0.16	0.17–0.25	0.26–0.66	0.67–1.8	>1.80	1.8–0.67	0.66–0.26
32		–	0.12–0.13	0.14–0.17	0.18–0.26	0.27–0.7	0.71–1.9	>1.90	1.9–0.71	0.7–0.27
–		0,80	0.12–0.13	0.14–0.17	0.18–0.26	0.27–0.71	0.72–1.91	>1.91	1.91–0.72	0.71–0.27
28		–	0.14–0.14	0.15–0.19	0.2–0.3	0.31–0.8	0.81–2.17	>2.17	2.17–0.81	0.8–0.31
27		–	0.14–0.15	0.16–0.2	0.21–0.31	0.32–0.83	0.84–2.25	>2.25	2.25–0.84	0.83–0.32
–		1,00	0.15–0.16	0.17–0.21	0.22–0.33	0.34–0.89	0.9–2.39	>2.39	2.39–0.9	0.89–0.34
24		–	0.16–0.17	0.18–0.23	0.24–0.35	0.36–0.94	0.95–2.53	>2.53	2.53–0.95	0.94–0.36
–		1,25	0.19–0.2	0.21–0.27	0.28–0.42	0.43–1.11	1.12–2.99	>2.99	2.99–1.12	1.11–0.43
20		–	0.19–0.21	0.22–0.27	0.28–0.42	0.43–1.13	1.14–3.04	>3.04	3.04–1.14	1.13–0.43
18		–	0.21–0.23	0.24–0.31	0.32–0.47	0.48–1.26	1.277–3.38	>3.38	3.38–1.27	1.26–0.48
–		1,50	0.22–0.25	0.26–0.33	0.34–0.5	0.51–1.34	1.35–3.59	>3.59	3.59–1.35	1.34–0.51
16		–	0.24–0.26	0.27–0.35	0.36–0.53	0.54–1.41	1.42–3.8	>3.80	3.8–1.42	1.41–0.54
–		1,75	0.26–0.29	0.3–0.38	0.39–0.59	0.6–1.56	1.57–4.19	>4.19	4.19–1.57	1.56–0.6
14		–	0.27–0.3	0.31–0.4	0.41–0.61	0.62–1.62	1.63–4.34	>4.34	4.34–1.63	1.62–0.62
13		–	0.29–0.32	0.33–0.43	0.44–0.66	0.67–1.74	1.75–4.68	>4.68	4.68–1.75	1.74–0.67
–		2,00	0.3–0.33	0.34–0.44	0.45–0.67	0.68–1.78	1.79–4.79	>4.79	4.79–1.79	1.78–0.68
12		–	0.32–0.35	0.36–0.46	0.47–0.71	0.72–1.89	1.9–5.07	>5.07	5.07–1.9	1.89–0.72
11.5		–	0.33–0.37	0.38–0.49	0.5–0.74	0.75–1.97	1.98–5.29	>5.29	5.29–1.98	1.97–0.75
11		–	0.34–0.38	0.39–0.51	0.52–0.78	0.79–2.06	2.07–5.53	>5.53	5.53–2.07	2.06–0.79
–		2,50	0.37–0.42	0.43–0.55	0.56–0.84	0.85–2.23	2.24–5.98	>5.98	5.98–2.24	2.23–0.85
10		–	0.38–0.42	0.43–0.56	0.57–0.86	0.87–2.27	2.28–6.08	>6.08	6.08–2.28	2.27–0.87
9		–	0.42–0.47	0.48–0.62	0.63–0.95	0.96–2.52	2.53–6.75	>6.75	6.75–2.53	2.52–0.96
–		3,00	0.45–0.5	0.51–0.66	0.67–1.02	1.03–2.68	2.69–7.18	>7.18	7.18–2.69	2.68–1.03
8		–	0.47–0.53	0.54–0.7	0.71–1.08	1.09–2.84	2.85–7.6	>7.60	7.6–2.85	2.84–1.09
–		3,50	0.52–0.59	0.6–0.77	0.78–1.19	1.2–3.13	3.14–8.38	>8.38	8.38–3.14	3.13–1.2
7		–	0.524–0.61	0.62–0.8	0.81–1.23	1.24–3.25	3.26–8.68	>8.68	8.68–3.26	3.25–1.24
–		4,00	0.6–0.67	0.68–0.89	0.9–1.36	1.37–3.58	3.59–9.57	>9.57	9.57–3.59	3.58–1.37
6		–	0.63–0.71	0.72–0.94	0.95–1.44	1.45–3.79	3.8–10.13	>10.13	10.13–3.8	3.79–1.45
–		5,00	0.75–0.84	0.85–1.11	1.12–1.7	1.71–4.48	4.49–11.97	>11.97	11.97–4.49	4.48–1.71
5		–	0.76–0.86	0.87–1.13	1.14–1.73	1.74–4.55	4.56–12.16	>12.16	12.16–4.56	4.55–1.74
4.5		–	0.84–0.95	0.96–1.26	1.27–1.92	1.93–5.06	5.07–13.51	>13.51	13.51–5.07	5.06–1.93
–		6,00	0.9–1.01	1.02–1.33	1.34–2.04	2.05–5.37	5.38–14.36	>14.36	14.36–5.38	5.37–2.05
4		–	0.95–1.07	1.08–1.41	1.42–2.16	2.17–5.69	5.7–15.2	>15.20	15.2–5.7	5.69–2.17
inclination angle			4.5	3.5	2.5	1.5	0.5	0.0	-0.5	-1.5
			standard helix (feed toward the chuck)						reverse helix (feed away from the chuck)	

1. Select TPI or pitch from the left-hand columns.
2. Follow row to specified pitch diameter and the correct feed direction.
3. Follow the column to the top for the required shim based on the toolholder and insert size.



standard helix method:
Used when RH thread is cut with RH tool or LH thread with LH tool.



reverse helix method:
Used when RH thread is cut with LH tool or when LH thread is cut with RH tool.