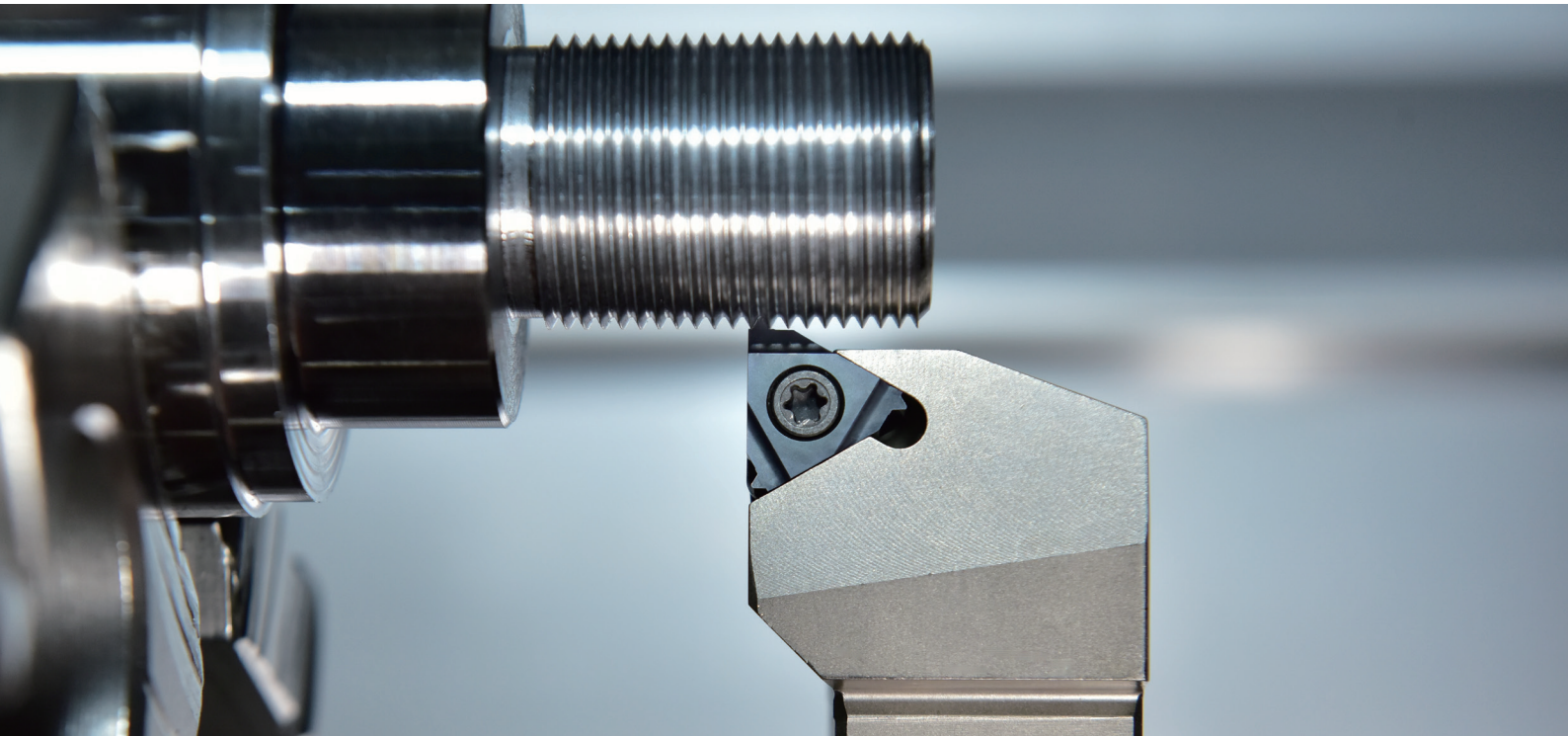




**ACHTECK**  
澳克泰工具

// 2025.03

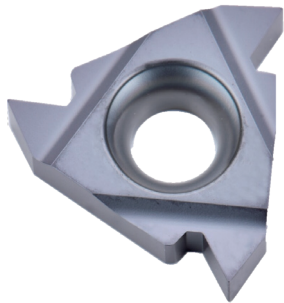
# *Thread Turning Products*



NO.103

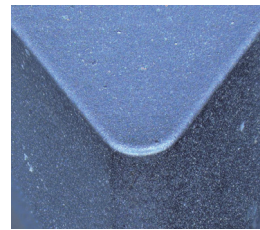
[www.achtecktool.com](http://www.achtecktool.com)

## Product Features

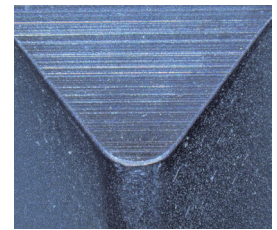


- Smooth PVD Coating**  
Effectively extend tool life
- Even cutting edge treatment**  
Achieve reliable performance
- Fine ground process**  
Level up threading tolerance

### Close-up comparison

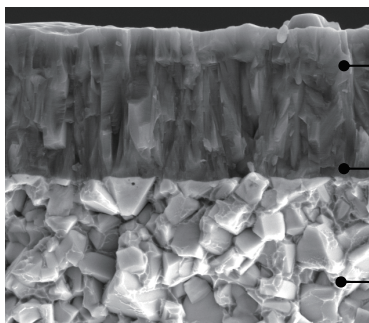


Rough and fine grinding

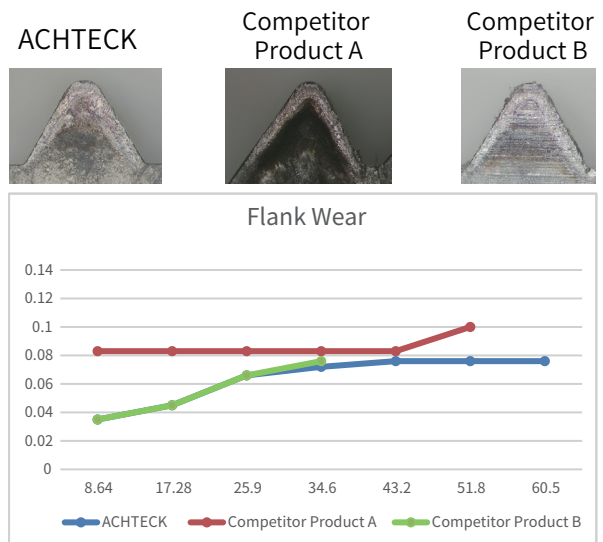


Bad surface roughness

## Performance Overview—AP220E



- Fine coating surface (TiAlN), offering smoothness and outstanding wear resistance.
- Excellent coating hardness and adhesion, significantly improving oxidation resistance during cutting.
- Micro-grain carbide substrate, providing good wear resistance.



## Test Cases

Tools	16ER 150ISO AP220E
	ATTER 2525M-16
Workpiece	
Material	4140
Cutting speed	140m/min
Feed	1.5mm/rev
Machining Method	Wet . Radial infeed
ap	0.22/0.2/0.17/0.16/0.12/0.08
Results	Thread Gauge Inspection Inspection: Qualified

Tools	16ER 150ISO AP220E
	ATTER 2525M-16
Workpiece	
Material	SUS316L
Cutting speed	120 m/min
Feed	1.5 mm/rev
Machining Method	Wet . Radial infeed
ap	0.16/0.15/0.14/0.12/0.10/0.10//0.10/0.08
Results	<p>Tool Life Improved by 17%</p>

## Grade Introduction

### AP220E(P15-P35)

1st choice for steel thread turning, The composite nanostructure coating was deposited on the substrate with high strength and high wear resistance.

### AP220U(P15-P35)

High-precision threading grade, suitable for thread turning of steel and stainless steel.

### AP120S(S15-S35)

High-precision threading grade, utilizing substrate strengthening technology to enhance the bonding force between cobalt and tungsten carbide, increasing substrate strength and improving the wear resistance and high-temperature oxidation resistance. Equipped with a smooth and high-temperature oxidation-resistant coating, it enhances the tool's resistance to built-up edge formation.

### AP020H(H10- H20)

High-precision threading grade, utilizing substrate strengthening technology to enhance the bonding force between cobalt and tungsten carbide, increasing substrate strength and improving the wear resistance and high-temperature oxidation resistance. Equipped with a high-hardness and oxidation-resistant coating, it significantly extends the tool's life.

## Parameter Recommendations

Workpiece Materials		Brinell Hardness (HB)	Cutting speed(m/min)			
			AP220E	AP220U	AP020H	AP120S
<b>P</b>	Non-alloy steel	120-170	60-200	60-200		
	Low-alloy steel	180-350	60-160	60-160		
	High-alloy steel	200-325	50-120	50-120		
<b>M</b>	Ferritic stainless steel	200-325	60-130	60-130		
	Austenitic stainless steel	180-200	40-140	40-140		
<b>K</b>	Malleable cast iron	130-230	60-150	60-150		
	Gray cast iron	180-260	70-130	70-130		
	Ductile cast iron	160-250	90-160	90-160		
<b>S</b>	Titanium alloys	200-375				50-70
	Superalloy	200-350				15-50
<b>H</b>	Hardened steel	45-55HRC			40-50	

- 1. For machining materials with high elastic modulus (e.g., stainless steel, heat-resistant stainless steel, and superalloys), it is necessary to appropriately increase the number of passes, with each depth of cut more than 0.08mm, to achieve better thread accuracy and insert life.
- To prevent tip chipping during the first cut, it is recommended to perform a pre-chamfer of C0.3-C0.5 on the workpiece.

## • Thread Profile Overview

General Machinery						
Partial Profile 55°	Partial Profile 60°	ISO Metric	American UN	Whitworth	NPT Taper Pipe Thread	British BSPT
Pitch: mm / TPI (Threads Per Inch)						
0.50-1.5 0.50-3.0 1.75-3.0 3.50-5.0	0.50-1.5 0.50-3.0 1.75-3.0 3.50-5.0	0.50 2.0 0.75 2.5 1.00 3.0 1.25 1.50	48 16 44 14 40 13 36 12 32 11.5 28 11 24 10 20 9 18 8	36 14 32 12 28 11 26 10 10 9 19 8	27 18 14 11.5 8	28 19 14 11

General Machinery		Aerospace		Petroleum		
ACME	Stub ACME	MJ ISO 5855	UNJ	API	API Round	API Buttress Casing
Pitch: mm / TPI (Threads Per Inch)						
16 8 14 6 12 5 10	16 8 14 6 12 5 10 4	0.75 2.0 1.00 2.5 1.25 3.0 1.50	48 16 44 14 40 13 36 12 32 11 28 10 24 9 20 8 18	4 (V-0.038R) 4 (V-0.050) 5 (V-0.040) 6 (V-0.055)	10 8	5

\* A wide range of thread types, including thread turning for general machinery, aerospace and petroleum industries

\* All ground inserts, better control of thread profile dimensional accuracy and consistency after insert indexing

\* Uniform edge honing and sharp cutting edges, more suitable for thread turning characteristics, resulting in superior thread surface quality

## Threading insert code system

<b>16</b>	<b>E</b>	<b>R</b>	<b>200</b>	<b>ISO</b>	<b>-</b>		<b>AP220U</b>
1	2	3	4	5		6	7

1- Insert size	
L(mm)	IC(mm)
08	4.76
11	6.35
16	9.525
22	12.7
27	15.875

2- Insert type
E: Laydown External Thread
I: Laydown Internal Thread
VE: Vertical External Thread
VI: Vertical Internal Thread
UE: U-Type External Thread
UI: U-Type Internal Thread

3- Hand of insert
R: Right hand
L: Left hand

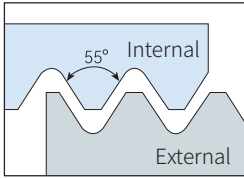
4- Pitch & TPI	
Pitch	
100	1mm
150	1.5mm
TPI	
24	24 threads per inch
20	20 threads per inch

5- Thread Type	
55	Partial profile 55°
60	Partial profile 60°
ISO	ISO Metric (Full Profile)
UN	American UN (Full Profile)
W	Whitworth (Full Profile)
NPT	NPT(National Pipe Thread)
BSPT	British Standard Pipe thread
ACME	American ACME
ST ACME	Stub ACME
MJ	MJ ISO5855
UNJ	UNJ
API	API

6- Number of teeth & Chip breaker
"None" -- standard
TQ--With TQ chip breaker
2M--Two teeth per corner

7- Insert Grades		
AP220E	Economical, Pressed and Sintered	P/M
AP220U	All Ground, High-Precision General grade	P/M/S
AP120S	All Ground, High-Temperature Alloy grade	M/S
AP020H	All Ground, Hardened Steel grade	H

## Partial profile 55° --External



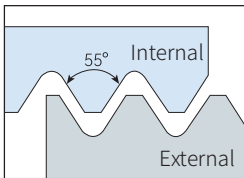
(mm)

Insert size	IC	S	D1	PNA
11..	6.35	3.0	3.2	55°
16..	9.525	3.52	4.0	
22..	12.7	4.72	5.1	

Insert Below shows right hand	Designation		Pitch & TPI		Dimension (mm)	Insert Grades		
	Right hand	Left hand	mm	TPI	PDX	AP220E	AP220U	AP020H
	<b>11ER A55</b>	<b>11EL A55</b>	0.5-1.5	48-16	0.9		●	○
	<b>16ER A55</b>	<b>16EL A55</b>	0.5-1.5	48-16	0.9	●	●	○
	<b>16ER AG55</b>	<b>16EL AG55</b>	0.5-3.0	48-8	1.7	●	●	○
	<b>16ER G55</b>	<b>16EL G55</b>	1.75-3.0	14-8	1.7	●	●	○
	<b>22ER N55</b>	<b>22EL N55</b>	3.5-5.0	7-5	2.5		●	○

● :Stocked ○ :Unstocked

## Partial profile 55° --Internal



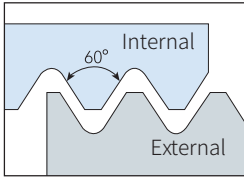
(mm)

Insert size	IC	S	D1	PNA
08..	4.76	2.25	2.6	55°
11..	6.35	3.0	3.2	
16..	9.525	3.52	4.0	
22..	12.7	4.72	5.1	

Insert Below shows right hand	Designation		Pitch & TPI		Dimension (mm)	Insert Grades		
	Right hand	Left hand	mm	TPI	PDX	AP220E	AP220U	AP020H
	<b>08IR A55</b>	<b>08IL A55</b>	0.5-1.5	48-16	0.7		○	○
	<b>11IR A55</b>	<b>11IL A55</b>	0.5-1.5	48-16	0.9		●	○
	<b>16IR A55</b>	<b>16IL A55</b>	0.5-1.5	48-16	0.9	●	●	○
	<b>16IR AG55</b>	<b>16IL AG55</b>	0.5-3.0	48-8	1.7	●	●	○
	<b>16IR G55</b>	<b>16IL G55</b>	1.75-3.0	14-8	1.7	●	●	○
	<b>22IR N55</b>	<b>22IL N55</b>	3.5-5.0	7-5	2.5		●	○

● :Stocked ○ :Unstocked

## Partial profile 60° --External

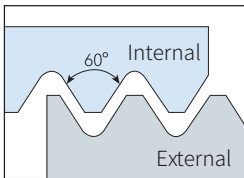


Insert size	IC	S	D1	PNA
11..	6.35	3.0	3.2	60°
16..	9.525	3.52	4.0	
22..	12.7	4.72	5.1	

Insert Below shows right hand	Designation		Pitch & TPI		Dimension (mm)	Insert Grades			
	Right hand	Left hand	mm	TPI	PDX	AP220E	AP220U	AP020H	AP120S
	<b>11ER A60</b>	<b>11EL A60</b>	0.5-1.5	48-16	0.9		●	○	○
	<b>16ER A60</b>	<b>16EL A60</b>	0.5-1.5	48-16	0.9	●	●	○	○
	<b>16ER AG60</b>	<b>16EL AG60</b>	0.5-3.0	48-8	1.7	●	●	○	○
	<b>16ER G60</b>	<b>16EL G60</b>	1.75-3.0	14-8	1.7	●	●	○	○
	<b>22ER N60</b>	<b>22EL N60</b>	3.5-5.0	7-5	2.5		●	○	○

● :Stocked ○ :Unstocked

## Partial profile 60° --Internal

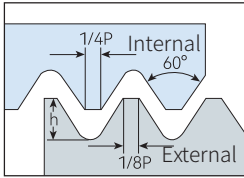


Insert size	IC	S	D1	PNA
08..	4.76	2.25	2.6	60°
11..	6.35	3.0	3.2	
16..	9.525	3.52	4.0	
22..	12.7	4.72	5.1	

Insert Below shows right hand	Designation		Pitch & TPI		Dimension (mm)	Insert Grades			
	Right hand	Left hand	mm	TPI	PDX	AP220E	AP220U	AP020H	AP120S
	<b>08IR A60</b>	<b>08IL A60</b>	0.5-1.5	48-16	0.6		○	○	○
	<b>11IR A60</b>	<b>11IL A60</b>	0.5-1.5	48-16	0.9		●	○	○
	<b>16IR A60</b>	<b>16IL A60</b>	0.5-1.5	48-16	0.9	●	●	○	○
	<b>16IR AG60</b>	<b>16IL AG60</b>	0.5-3.0	48-8	1.7	●	●	○	○
	<b>16IR G60</b>	<b>16IL G60</b>	1.75-3.0	14-8	1.7	●	●	○	○
	<b>22IR N60</b>	<b>22IL N60</b>	3.5-5.0	7-5	2.4		●	○	○

● :Stocked ○ :Unstocked

## ISO Metric(Full Profile)--External



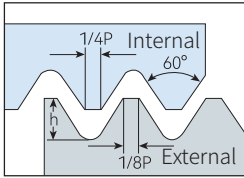
(mm)

Insert size	IC	S	D1	PNA
11..	6.35	3.0	3.2	60°
16..	9.525	3.52	4.0	
22..	12.7	4.72	5.1	

Insert Below shows right hand	Designation		Pitch (mm)	Dimension (mm)	Insert Grades			
	Right hand	Left hand		PDX	AP220E	AP220U	AP020H	AP120S
	<b>11ER 050ISO</b>	<b>11EL 050ISO</b>	0.50	0.4		●	○	○
	<b>11ER 075ISO</b>	<b>11EL 075ISO</b>	0.75	0.6		●	○	○
	<b>11ER 080ISO</b>	<b>11EL 080ISO</b>	0.80	0.6		●	○	○
	<b>11ER 100ISO</b>	<b>11EL 100ISO</b>	1.00	0.7		●	○	○
	<b>11ER 125ISO</b>	<b>11EL 125ISO</b>	1.25	0.9		●	○	○
	<b>11ER 150ISO</b>	<b>11EL 150ISO</b>	1.50	1.0		●	○	○
	<b>16ER 050ISO</b>	<b>16EL 050ISO</b>	0.50	0.6	●	●	○	○
	<b>16ER 075ISO</b>	<b>16EL 075ISO</b>	0.75	0.6	●	●	○	○
	<b>16ER 100ISO</b>	<b>16EL 100ISO</b>	1.00	0.7	●	●	○	○
	<b>16ER 125ISO</b>	<b>16EL 125ISO</b>	1.25	0.9	●	●	○	○
	<b>16ER 150ISO</b>	<b>16EL 150ISO</b>	1.50	1.0	●	●	○	○
	<b>16ER 175ISO</b>	<b>16EL 175ISO</b>	1.75	1.2	●	●	○	○
	<b>16ER 200ISO</b>	<b>16EL 200ISO</b>	2.00	1.3	●	●	○	○
	<b>16ER 250ISO</b>	<b>16EL 250ISO</b>	2.50	1.5	●	●	○	○
	<b>16ER 300ISO</b>	<b>16EL 300ISO</b>	3.00	1.6	●	●	○	○
	<b>22ER 350ISO</b>	<b>22EL 350ISO</b>	3.50	2.3		●	○	○
	<b>22ER 400ISO</b>	<b>22EL 400ISO</b>	4.00	2.3		●	○	○
	<b>22ER 450ISO</b>	<b>22EL 450ISO</b>	4.50	2.4		●	○	○
	<b>22ER 500ISO</b>	<b>22EL 500ISO</b>	5.00	2.5		●	○	○

● :Stocked ○ :Unstocked

## ISO Metric(Full Profile)--Internal



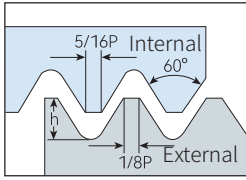
(mm)

Insert size	IC	S	D1	PNA
11..	6.35	3.0	3.2	60°
16..	9.525	3.52	4.0	
22..	12.7	4.72	5.1	

Insert Below shows right hand	Designation		Pitch (mm)	Dimension (mm)	Insert Grades			
	Right hand	Left hand		PDX	AP220E	AP220U	AP020H	AP120S
	<b>11IR 050ISO</b>	<b>11IL 050ISO</b>	0.50	0.6		●	○	○
	<b>11IR 075ISO</b>	<b>11IL 075ISO</b>	0.75	0.6		●	○	○
	<b>11IR 100ISO</b>	<b>11IL 100ISO</b>	1.00	0.6		●	○	○
	<b>11IR 125ISO</b>	<b>11IL 125ISO</b>	1.25	0.7		●	○	○
	<b>11IR 150ISO</b>	<b>11IL 150ISO</b>	1.50	0.9		●	○	○
	<b>11IR 175ISO</b>	<b>11IL 175ISO</b>	1.75	1.0		●	○	○
	<b>11IR 200ISO</b>	<b>11IL 200ISO</b>	2.00	1.2		●	○	○
	<b>16IR 050ISO</b>	<b>16IL 050ISO</b>	0.50	1.3	●	●	○	○
	<b>16IR 075ISO</b>	<b>16IL 075ISO</b>	0.75	0.6	●	●	○	○
	<b>16IR 100ISO</b>	<b>16IL 100ISO</b>	1.00	0.7	●	●	○	○
	<b>16IR 125ISO</b>	<b>16IL 125ISO</b>	1.25	0.9	●	●	○	○
	<b>16IR 150ISO</b>	<b>16IL 150ISO</b>	1.50	1.0	●	●	○	○
	<b>16IR 175ISO</b>	<b>16IL 175ISO</b>	1.75	1.2	●	●	○	○
	<b>16IR 200ISO</b>	<b>16IL 200ISO</b>	2.00	1.3	●	●	○	○
	<b>16IR 250ISO</b>	<b>16IL 250ISO</b>	2.50	1.5	●	●	○	○
	<b>16IR 300ISO</b>	<b>16IL 300ISO</b>	3.00	1.5	●	●	○	○
	<b>22IR 350ISO</b>	<b>22IL 350ISO</b>	3.50	2.3		●	○	○
	<b>22IR 400ISO</b>	<b>22IL 400ISO</b>	4.00	2.3		●	○	○
	<b>22IR 450ISO</b>	<b>22IL 450ISO</b>	4.50	2.4		●	○	○
	<b>22IR 500ISO</b>	<b>22IL 500ISO</b>	5.00	2.5		●	○	○

● :Stocked ○ :Unstocked

## MJ ISO 5855--External

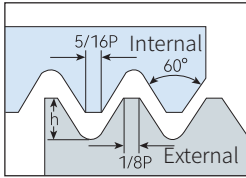


Insert size	IC	S	D1	PNA
11..	9.525	3.52	4.0	60°
16..	12.7	4.72	5.1	

Insert Below shows right hand	Designation		Pitch (mm)	Dimension (mm)	Insert Grades			
	Right hand	Left hand		PDX	AP220E	AP220U	AP020H	AP120S
	<b>11ER 100MJ</b>	<b>11EL 100MJ</b>	1.00	0.7		●		●
	<b>11ER 125MJ</b>	<b>11EL 125MJ</b>	1.25	0.9		●		●
	<b>11ER 150MJ</b>	<b>11EL 150MJ</b>	1.50	1.0		●		●
	<b>11ER 200MJ</b>	<b>11EL 200MJ</b>	2.00	1.0		●		●
	<b>16ER 075MJ</b>	<b>16EL 075MJ</b>	0.75	0.6		●		●
	<b>16ER 100MJ</b>	<b>16EL 100MJ</b>	1.00	0.7		●		●
	<b>16ER 125MJ</b>	<b>16EL 125MJ</b>	1.25	0.9		●		●
	<b>16ER 150MJ</b>	<b>16EL 150MJ</b>	1.50	1.0		●		●
	<b>16ER 200MJ</b>	<b>16EL 200MJ</b>	2.00	1.3		●		●
	<b>16ER 250MJ</b>	<b>16EL 250MJ</b>	2.50	1.5		●		●
	<b>16ER 300MJ</b>	<b>16EL 300MJ</b>	3.00	1.6		●		●

● :Stocked ○ :Unstocked

## MJ ISO 5855--Internal



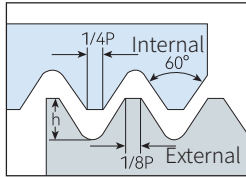
(mm)

Insert size	IC	S	D1	PNA
11..	9.525	3.52	4.0	60°
16..	12.7	4.72	5.1	

Insert Below shows right hand	Designation		Pitch (mm)	Dimension (mm)		Insert Grades		
	Right hand	Left hand		PDX	AP220E	AP220U	AP020H	AP120S
	<b>11IR 100MJ</b>	<b>11IL 100MJ</b>	1.00	0.7		●		●
	<b>11IR 125MJ</b>	<b>11IL 125MJ</b>	1.25	0.9		●		●
	<b>11IR 150MJ</b>	<b>11IL 150MJ</b>	1.50	1.0		●		●
	<b>11IR 200MJ</b>	<b>11IL 200MJ</b>	2.00	1.0		●		●
	<b>16IR 075MJ</b>	<b>16IL 075MJ</b>	0.75	0.6		●		●
	<b>16IR 100MJ</b>	<b>16IL 100MJ</b>	1.00	0.7		●		●
	<b>16IR 125MJ</b>	<b>16IL 125MJ</b>	1.25	0.9		●		●
	<b>16IR 150MJ</b>	<b>16IL 150MJ</b>	1.50	1.0		●		●
	<b>16IR 200MJ</b>	<b>16IL 200MJ</b>	2.00	1.3		●		●
	<b>16IR 250MJ</b>	<b>16IL 250MJ</b>	2.50	1.5		●		●
	<b>16IR 300MJ</b>	<b>16IL 300MJ</b>	3.00	1.6		●		●

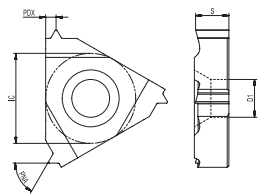
● :Stocked ○ :Unstocked

## American UN (Full Profile)--External



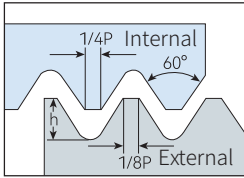
Insert size	IC	S	D1	PNA
11..	6.35	3.0	3.2	60°
16..	9.525	3.52	4.0	
22..	12.7	4.72	5.1	

Insert Below shows right hand	Designation		Threads Per Inch	Dimension (mm)	Insert Grades			
	Right hand	Left hand	TPI	PDX	AP220E	AP220U	AP020H	AP120S
	11ER 48UN	11EL 48UN	48	0.6		●	○	○
	11ER 44UN	11EL 44UN	44	0.6		●	○	○
	11ER 40UN	11EL 40UN	40	0.6		●	○	○
	11ER 36UN	11EL 36UN	36	0.6		●	○	○
	11ER 32UN	11EL 32UN	32	0.6		●	○	○
	11ER 28UN	11EL 28UN	28	0.7		●	○	○
	11ER 24UN	11EL 24UN	24	0.8		●	○	○
	11ER 20UN	11EL 20UN	20	0.9		●	○	○
	11ER 18UN	11EL 18UN	18	1.0		●	○	○
	11ER 16UN	11EL 16UN	16	1.1		●	○	○
	16ER 48UN	16EL 48UN	48	0.6	●	●	○	○
	16ER 44UN	16EL 44UN	44	0.6	●	●	○	○
	16ER 40UN	16EL 40UN	40	0.6	●	●	○	○
	16ER 36UN	16EL 36UN	36	0.6	●	●	○	○
	16ER 32UN	16EL 32UN	32	0.6	●	●	○	○
	16ER 28UN	16EL 28UN	28	0.7	●	●	○	○
	16ER 24UN	16EL 24UN	24	0.8	●	●	○	○
	16ER 20UN	16EL 20UN	20	0.9	●	●	○	○
	16ER 18UN	16EL 18UN	18	1.0	●	●	○	○
	16ER 16UN	16EL 16UN	16	1.1	●	●	○	○
	16ER 14UN	16EL 14UN	14	1.2	●	●	○	○
	16ER 13UN	16EL 13UN	13	1.3	●	●	○	○
	16ER 12UN	16EL 12UN	12	1.4	●	●	○	○
	16ER 11.5UN	16EL 11.5UN	11.5	1.4	●	●	○	○
	16ER 11UN	16EL 11UN	11	1.5	●	●	○	○
	16ER 10UN	16EL 10UN	10	1.5	●	●	○	○
	16ER 9UN	16EL 9UN	9	1.7	●	●	○	○
	16ER 8UN	16EL 8UN	8	2.0	●	●	○	○
	22ER 7UN	22EL 7UN	7	2.3		●	○	○
	22ER 6UN	22EL 6UN	6	2.3		●	○	○
	22ER 5UN	22EL 5UN	5	2.5		●	○	○



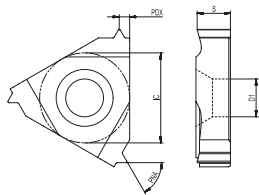
● :Stocked ○ :Unstocked

## American UN (Full Profile)--Internal



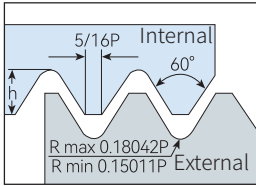
Insert size	IC	S	D1	PNA
08..	4.76	2.25	2.6	60°
11..	6.35	3.0	3.2	
16..	9.525	3.52	4.0	
22..	12.7	4.72	5.1	

Insert Below shows right hand	Designation		Threads Per Inch	Dimension (mm)	Insert Grades			
	Right hand	Left hand	TPI	PDX	AP220E	AP220U	AP020H	AP120S
	08IR 48UN	08IL 48UN	48	0.6		○	○	○
	08IR 44UN	08IL 44UN	44	0.6		○	○	○
	08IR 40UN	08IL 40UN	40	0.6		○	○	○
	08IR 36UN	08IL 36UN	36	0.6		○	○	○
	08IR 32UN	08IL 32UN	32	0.5		○	○	○
	08IR 28UN	08IL 28UN	28	0.6		○	○	○
	08IR 24UN	08IL 24UN	24	0.6		○	○	○
	08IR 20UN	08IL 20UN	20	0.7		○	○	○
	08IR 18UN	08IL 18UN	18	0.7		○	○	○
	08IR 16UN	08IL 16UN	16	0.7		○	○	○
	11IR 48UN	11IL 48UN	48	0.6		●	○	○
	11IR 44UN	11IL 44UN	44	0.6		●	○	○
	11IR 40UN	11IL 40UN	40	0.6		●	○	○
	11IR 36UN	11IL 36UN	36	0.6		●	○	○
	11IR 32UN	11IL 32UN	32	0.6		●	○	○
	11IR 28UN	11IL 28UN	28	0.7		●	○	○
	11IR 24UN	11IL 24UN	24	0.8		●	○	○
	11IR 20UN	11IL 20UN	20	0.9		●	○	○
	11IR 18UN	11IL 18UN	18	1.0		●	○	○
	11IR 16UN	11IL 16UN	16	1.1		●	○	○
	16IR 48UN	16IL 48UN	48	0.6		●	○	○
	16IR 44UN	16IL 44UN	44	0.6		●	○	○
	16IR 40UN	16IL 40UN	40	0.6		●	○	○
	16IR 36UN	16IL 36UN	36	0.6		●	○	○
	16IR 32UN	16IL 32UN	32	0.6	●	●	○	○
	16IR 28UN	16IL 28UN	28	0.7	●	●	○	○
	16IR 24UN	16IL 24UN	24	0.8	●	●	○	○
	16IR 20UN	16IL 20UN	20	0.9	●	●	○	○
	16IR 18UN	16IL 18UN	18	1.0	●	●	○	○
	16IR 16UN	16IL 16UN	16	1.1	●	●	○	○
	16IR 14UN	16IL 14UN	14	1.2	●	●	○	○
	16IR 12UN	16IL 12UN	12	1.4	●	●	○	○
	16IR 11UN	16IL 11UN	11	1.5	●	●	○	○
	16IR 10UN	16IL 10UN	10	1.5	●	●	○	○
	16IR 9UN	16IL 9UN	9	1.7	●	●	○	○
	16IR 8UN	16IL 8UN	8	1.5	●	●	○	○
	22IR 7UN	22IL 7UN	7	2.3		●	○	○
	22IR 6UN	22IL 6UN	6	2.3		●	○	○
	22IR 5UN	22IL 5UN	5	2.3		●	○	○



● :Stocked ○ :Unstocked

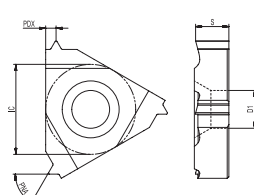
## UNJ--External



(mm)

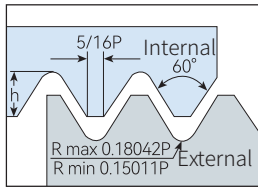
Insert size	IC	S	D1	PNA
11..	6.35	3.0	3.2	60°
16..	9.525	3.52	4.0	
22..	12.7	4.72	5.1	

Insert Below shows right hand	Designation		Threads Per Inch	Dimension (mm)	Insert Grades			
	Right hand	Left hand	TPI	PDX	AP220E	AP220U	AP020H	AP120S
	11ER 48UNJ	11EL 48UNJ	48	0.5		●		●
	11ER 44UNJ	11EL 44UNJ	44	0.6		●		●
	11ER 40UNJ	11EL 40UNJ	40	0.6		●		●
	11ER 36UNJ	11EL 36UNJ	36	0.6		●		●
	11ER 32UNJ	11EL 32UNJ	32	0.7		●		●
	11ER 28UNJ	11EL 28UNJ	28	0.7		●		●
	11ER 24UNJ	11EL 24UNJ	24	0.8		●		●
	11ER 20UNJ	11EL 20UNJ	20	0.9		●		●
	11ER 18UNJ	11EL 18UNJ	18	1.0		●		●
	11ER 16UNJ	11EL 16UNJ	16	1.0		●		●
	11ER 14UNJ	11EL 14UNJ	14	1.2		●		●
	16ER 48UNJ	16EL 48UNJ	48	0.5		●		●
	16ER 44UNJ	16EL 44UNJ	44	0.6		●		●
	16ER 40UNJ	16EL 40UNJ	40	0.6		●		●
	16ER 36UNJ	16EL 36UNJ	36	0.6		●		●
	16ER 32UNJ	16EL 32UNJ	32	0.7		●		●
	16ER 28UNJ	16EL 28UNJ	28	0.7		●		●
	16ER 24UNJ	16EL 24UNJ	24	0.8		●		●
	16ER 20UNJ	16EL 20UNJ	20	0.9		●		●
	16ER 18UNJ	16EL 18UNJ	18	1.0		●		●
	16ER 16UNJ	16EL 16UNJ	16	1.0		●		●
	16ER 14UNJ	16EL 14UNJ	14	1.2		●		●
	16ER 13UNJ	16EL 13UNJ	13	1.3		●		●
	16ER 12UNJ	16EL 12UNJ	12	1.3		●		●
	16ER 11UNJ	16EL 11UNJ	11	1.5		●		●
	16ER 10UNJ	16EL 10UNJ	10	1.5		●		●
	16ER 9UNJ	16EL 9UNJ	9	1.7		●		●
	16ER 8UNJ	16EL 8UNJ	8	1.6		●		●
	22ER 7UNJ	22EL 7UNJ	7	2.3		●		●
	22ER 6UNJ	22EL 6UNJ	6	2.3		●		●
	22ER 5UNJ	22EL 5UNJ	5	2.5		●		●



● :Stocked ○ :Unstocked

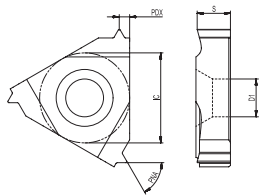
## UNJ--Internal



(mm)

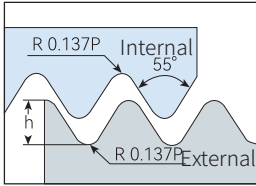
Insert size	IC	S	D1	PNA
11..	6.35	3.0	3.2	60°
16..	9.525	3.52	4.0	
22..	12.7	4.72	5.1	

Insert Below shows right hand	Designation		Threads Per Inch	Dimension (mm)	Insert Grades			
	Right hand	Left hand	TPI	PDX	AP220E	AP220U	AP020H	AP120S
	<b>11IR 48UNJ</b>	<b>11IL 48UNJ</b>	48	0.5		●		●
	<b>11IR 44UNJ</b>	<b>11IL 44UNJ</b>	44	0.6		●		●
	<b>11IR 40UNJ</b>	<b>11IL 40UNJ</b>	40	0.6		●		●
	<b>11IR 36UNJ</b>	<b>11IL 36UNJ</b>	36	0.6		●		●
	<b>11IR 32UNJ</b>	<b>11IL 32UNJ</b>	32	0.7		●		●
	<b>11IR 28UNJ</b>	<b>11IL 28UNJ</b>	28	0.7		●		●
	<b>11IR 24UNJ</b>	<b>11IL 24UNJ</b>	24	0.8		●		●
	<b>11IR 20UNJ</b>	<b>11IL 20UNJ</b>	20	0.9		●		●
	<b>11IR 18UNJ</b>	<b>11IL 18UNJ</b>	18	1.0		●		●
	<b>11IR 16UNJ</b>	<b>11IL 16UNJ</b>	16	1.0		●		●
	<b>11IR 14UNJ</b>	<b>11IL 14UNJ</b>	14	1.2		●		●
	<b>16IR 48UNJ</b>	<b>16IL 48UNJ</b>	48	0.5		●		●
	<b>16IR 44UNJ</b>	<b>16IL 44UNJ</b>	44	0.6		●		●
	<b>16IR 40UNJ</b>	<b>16IL 40UNJ</b>	40	0.6		●		●
	<b>16IR 36UNJ</b>	<b>16IL 36UNJ</b>	36	0.6		●		●
	<b>16IR 32UNJ</b>	<b>16IL 32UNJ</b>	32	0.7		●		●
	<b>16IR 28UNJ</b>	<b>16IL 28UNJ</b>	28	0.7		●		●
	<b>16IR 24UNJ</b>	<b>16IL 24UNJ</b>	24	0.8		●		●
	<b>16IR 20UNJ</b>	<b>16IL 20UNJ</b>	20	0.9		●		●
	<b>16IR 18UNJ</b>	<b>16IL 18UNJ</b>	18	1.0		●		●
	<b>16IR 16UNJ</b>	<b>16IL 16UNJ</b>	16	1.0		●		●
	<b>16IR 14UNJ</b>	<b>16IL 14UNJ</b>	14	1.2		●		●
	<b>16IR 13UNJ</b>	<b>16IL 13UNJ</b>	13	1.3		●		●
	<b>16IR 12UNJ</b>	<b>16IL 12UNJ</b>	12	1.3		●		●
	<b>16IR 11UNJ</b>	<b>16IL 11UNJ</b>	11	1.5		●		●
	<b>16IR 10UNJ</b>	<b>16IL 10UNJ</b>	10	1.5		●		●
	<b>16IR 9UNJ</b>	<b>16IL 9UNJ</b>	9	1.7		●		●
	<b>16IR 8UNJ</b>	<b>16IL 8UNJ</b>	8	1.6		●		●
	<b>22IR 7UNJ</b>	<b>22IL 7UNJ</b>	7	2.3		●		●
	<b>22IR 6UNJ</b>	<b>22IL 6UNJ</b>	6	2.3		●		●
	<b>22IR 5UNJ</b>	<b>22IL 5UNJ</b>	5	2.5		●		●



● :Stocked ○ :Unstocked

## Whitworth (Full Profile)--External

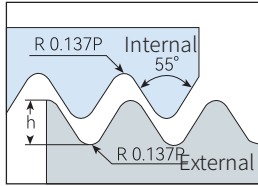


Insert size	IC	S	D1	PNA
11..	6.35	3.0	3.2	55°
16..	9.525	3.52	4.0	
22..	12.7	4.72	5.1	

Insert Below shows right hand	Designation		Threads Per Inch	Dimension (mm)	Insert Grades			
	Right hand	Left hand	TPI	PDX	AP220E	AP220U	AP020H	AP120S
	<b>11ER 36W</b>	<b>11EL 36W</b>	36	0.6		●	○	○
	<b>11ER 32W</b>	<b>11EL 32W</b>	32	0.6		●	○	○
	<b>11ER 28W</b>	<b>11EL 28W</b>	28	0.6		●	○	○
	<b>11ER 26W</b>	<b>11EL 26W</b>	26	0.7		●	○	○
	<b>11ER 20W</b>	<b>11EL 20W</b>	20	0.8		●	○	○
	<b>11ER 19W</b>	<b>11EL 19W</b>	19	0.9		●	○	○
	<b>11ER 16W</b>	<b>11EL 16W</b>	16	1.1		●	○	○
	<b>11ER 14W</b>	<b>11EL 14W</b>	14	0.6		●	○	○
	<b>16ER 36W</b>	<b>16EL 36W</b>	36	0.6	●	●	○	○
	<b>16ER 32W</b>	<b>16EL 32W</b>	32	0.6	●	●	○	○
	<b>16ER 28W</b>	<b>16EL 28W</b>	28	0.7	●	●	○	○
	<b>16ER 26W</b>	<b>16EL 26W</b>	26	0.8	●	●	○	○
	<b>16ER 20W</b>	<b>16EL 20W</b>	20	0.9	●	●	○	○
	<b>16ER 19W</b>	<b>16EL 19W</b>	19	1.0	●	●	○	○
	<b>16ER 14W</b>	<b>16EL 14W</b>	14	1.2	●	●	○	○
	<b>16ER 12W</b>	<b>16EL 12W</b>	12	1.4	●	●	○	○
	<b>16ER 11W</b>	<b>16EL 11W</b>	11	1.5	●	●	○	○
	<b>16ER 10W</b>	<b>16EL 10W</b>	10	1.5	●	●	○	○
	<b>16ER 9W</b>	<b>16EL 9W</b>	9	1.7	●	●	○	○
	<b>16ER 8W</b>	<b>16EL 8W</b>	8	2.0	●	●	○	○
	<b>22ER 7W</b>	<b>22EL 7W</b>	7	2.3		●	○	○
	<b>22ER 6W</b>	<b>22EL 6W</b>	6	2.3		●	○	○
	<b>22ER 5W</b>	<b>22EL 5W</b>	5	2.5		●	○	○

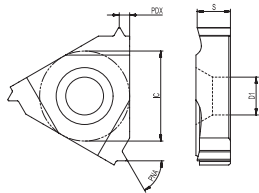
● :Stocked ○ :Unstocked

## Whitworth (Full Profile)--Internal



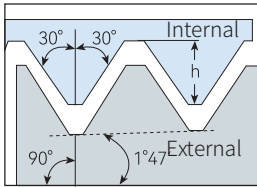
Insert size	IC	S	D1	PNA
08..	4.76	2.25	2.6	55°
11..	6.35	3.0	3.2	
16..	9.525	3.52	4.0	
22..	12.7	4.72	5.1	

Insert Below shows right hand	Designation		Threads Per Inch	Dimension (mm)	Insert Grades			
	Right hand	Left hand	TPI	PDX	AP220E	AP220U	AP020H	AP120S
	08IR 36W	08IL 36W	36	0.6		○	○	○
	08IR 32W	08IL 32W	32	0.6		○	○	○
	08IR 28W	08IL 28W	28	0.6		○	○	○
	08IR 26W	08IL 26W	26	0.6		○	○	○
	08IR 24W	08IL 24W	24	0.7		○	○	○
	08IR 20W	08IL 20W	20	0.7		○	○	○
	08IR 19W	08IL 19W	19	0.7		○	○	○
	08IR 16W	08IL 16W	16	0.7		○	○	○
	11IR 36W	11IL 36W	36	0.6		●	○	○
	11IR 32W	11IL 32W	32	0.6		●	○	○
	11IR 28W	11IL 28W	28	0.6		●	○	○
	11IR 26W	11IL 26W	26	0.7		●	○	○
	11IR 20W	11IL 20W	20	0.8		●	○	○
	11IR 19W	11IL 19W	19	0.9		●	○	○
	11IR 16W	11IL 16W	16	1.1		●	○	○
	11IR 14W	11IL 14W	14	0.6		●	○	○
	16IR 36W	16IL 36W	36	0.6	●	●	○	○
	16IR 32W	16IL 32W	32	0.6	●	●	○	○
	16IR 28W	16IL 28W	28	0.7	●	●	○	○
	16IR 26W	16IL 26W	26	0.8	●	●	○	○
	16IR 20W	16IL 20W	20	0.9	●	●	○	○
	16IR 19W	16IL 19W	19	1.0	●	●	○	○
	16IR 14W	16IL 14W	14	1.2	●	●	○	○
	16IR 12W	16IL 12W	12	1.4	●	●	○	○
	16IR 11W	16IL 11W	11	1.5	●	●	○	○
	16IR 10W	16IL 10W	10	1.5	●	●	○	○
	16IR 9W	16IL 9W	9	1.7	●	●	○	○
	16IR 8W	16IL 8W	8	2.0	●	●	○	○
	22IR 7W	22IL 7W	7	2.3		●	○	○
	22IR 6W	22IL 6W	6	2.3		●	○	○
	22IR 5W	22IL 5W	5	2.5		●	○	○



● :Stocked ○ :Unstocked

## NPT(National Pipe Thread)--External

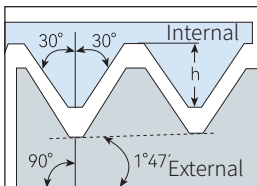


Insert size	IC	S	D1	PNA
11..	6.35	3.0	3.2	60°
16..	9.525	3.52	4.0	

Insert Below shows right hand	Designation		Threads Per Inch	Dimension (mm)	Insert Grades			
	Right hand	Left hand	TPI	PDX	AP220E	AP220U	AP020H	AP120S
	<b>11ER 27NPT</b>	<b>11EL 27NPT</b>	27	0.8		●	○	○
	<b>11ER 18NPT</b>	<b>11EL 18NPT</b>	18	1.0		●	○	○
	<b>11ER 14NPT</b>	<b>11EL 14NPT</b>	14	1.0		●	○	○
	<b>16ER 27NPT</b>	<b>16EL 27NPT</b>	27	0.8	●	●	○	○
	<b>16ER 18NPT</b>	<b>16EL 18NPT</b>	18	1.0	●	●	○	○
	<b>16ER 14NPT</b>	<b>16EL 14NPT</b>	14	1.2	●	●	○	○
	<b>16ER 11.5NPT</b>	<b>16EL 11.5NPT</b>	11.5	1.5	●	●	○	○
	<b>16ER 8NPT</b>	<b>16EL 8NPT</b>	8	1.8	●	●	○	○

● :Stocked ○ :Unstocked

## NPT(National Pipe Thread)--Internal

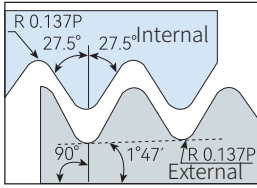


Insert size	IC	S	D1	PNA
08..	4.76	2.25	2.6	60°
11..	6.35	3.0	3.2	
16..	9.525	3.52	4.0	

Insert Below shows is right hand	Designation		Threads Per Inch	Dimension (mm)	Insert Grades			
	Right hand	Left hand	TPI	PDX	AP220E	AP220U	AP020H	AP120S
	<b>08IR 27NPT</b>	<b>08IL 27NPT</b>	27	0.6		○	○	○
	<b>08IR 18NPT</b>	<b>08IL 18NPT</b>	18	0.6		○	○	○
	<b>11IR 27NPT</b>	<b>11IL 27NPT</b>	27	0.8		●	○	○
	<b>11IR 18NPT</b>	<b>11IL 18NPT</b>	18	1.0		●	○	○
	<b>11IR 14NPT</b>	<b>11IL 14NPT</b>	14	1.0		●	○	○
	<b>16IR 27NPT</b>	<b>16IL 27NPT</b>	27	0.8	●	●	○	○
	<b>16IR 18NPT</b>	<b>16IL 18NPT</b>	18	1.0	●	●	○	○
	<b>16IR 14NPT</b>	<b>16IL 14NPT</b>	14	1.2	●	●	○	○
	<b>16IR 11.5NPT</b>	<b>16IL 11.5NPT</b>	11.5	1.5	●	●	○	○
	<b>16IR 8NPT</b>	<b>16IL 8NPT</b>	8	1.8	●	●	○	○

● :Stocked ○ :Unstocked

## British Standard Pipe Thread--External



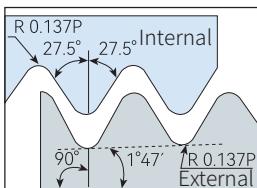
(mm)

Insert size	IC	S	D1	PNA
11..	6.35	3.0	3.2	55°
16..	9.525	3.52	4.0	

Insert Below shows right hand	Designation		Threads Per Inch	Dimension (mm)	Insert Grades			
	Right hand	Left hand	TPI	PDX	AP220E	AP220U	AP020H	AP120S
	<b>11ER 28BSPT</b>	<b>11EL 28BSPT</b>	28	0.6		●	○	○
	<b>11ER 19BSPT</b>	<b>11EL 19BSPT</b>	19	0.9		●	○	○
	<b>11ER 14BSPT</b>	<b>11EL 14BSPT</b>	14	1.0		●	○	○
	<b>16ER 28BSPT</b>	<b>16EL 28BSPT</b>	28	0.6	●	●	○	○
	<b>16ER 19BSPT</b>	<b>16EL 19BSPT</b>	19	0.9	●	●	○	○
	<b>16ER 14BSPT</b>	<b>16EL 14BSPT</b>	14	1.2	●	●	○	○
	<b>16ER 11BSPT</b>	<b>16EL 11BSPT</b>	11	1.5	●	●	○	○

● :Stocked ○ :Unstocked

## British Standard Pipe Thread--Internal



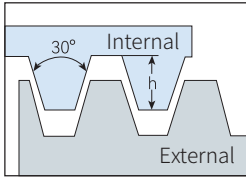
(mm)

Insert size	IC	S	D1	PNA
08..	4.76	2.25	2.6	55°
11..	6.35	3.0	3.2	
16..	9.525	3.52	4.0	

Insert Below shows is right hand	Designation		Threads Per Inch	Dimension (mm)	Insert Grades			
	Right hand	Left hand	TPI	PDX	AP220E	AP220U	AP020H	AP120S
	<b>08IR 28BSPT</b>	<b>08IL 28BSPT</b>	28	0.6		○	○	○
	<b>08IR 19BSPT</b>	<b>08IL 19BSPT</b>	19	0.6		○	○	○
	<b>11IR 28BSPT</b>	<b>11IL 28BSPT</b>	28	0.6		●	○	○
	<b>11IR 19BSPT</b>	<b>11IL 19BSPT</b>	19	0.9		●	○	○
	<b>11IR 14BSPT</b>	<b>11IL 14BSPT</b>	14	1.0		●	○	○
	<b>16IR 28BSPT</b>	<b>16IL 28BSPT</b>	28	0.6	●	●	○	○
	<b>16IR 19BSPT</b>	<b>16IL 19BSPT</b>	19	0.9	●	●	○	○
	<b>16IR 14BSPT</b>	<b>16IL 14BSPT</b>	14	1.2	●	●	○	○
	<b>16IR 11BSPT</b>	<b>16IL 11BSPT</b>	11	1.5	●	●	○	○

● :Stocked ○ :Unstocked

## Trapez DIN 103--External

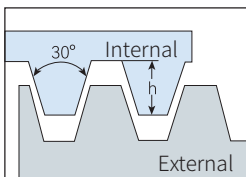


Insert size	IC	S	D1	PNA
11..	6.35	3.0	3.2	30°
16..	9.525	3.52	4.0	
22..	12.7	4.72	5.1	

Insert Below shows right hand	Designation		Pitch (mm)	Dimension (mm)	Insert Grades			
	Right hand	Left hand		PDX	AP220E	AP220U	AP020H	AP120S
	<b>11ER 150TR</b>	<b>11EL 150TR</b>	1.50	0.9		●	●	○
	<b>16ER 150TR</b>	<b>16EL 150TR</b>	1.50	1.1	●	○	●	○
	<b>16ER 200TR</b>	<b>16EL 200TR</b>	2.00	1.3	●	○	●	○
	<b>16ER 250TR</b>	<b>16EL 250TR</b>	2.50	1.4	●	○	●	○
	<b>16ER 300TR</b>	<b>16EL 300TR</b>	3.00	1.5	●	○	●	○
	<b>22ER 400TR</b>	<b>22EL 400TR</b>	4.00	1.9		●	●	○
	<b>22ER 500TR</b>	<b>22EL 500TR</b>	5.00	2.5		●	●	○
	<b>22ER 600TR</b>	<b>22EL 600TR</b>	6.00	2.7		●	●	○

● :Stocked ○ :Unstocked

## Trapez DIN 103--Internal

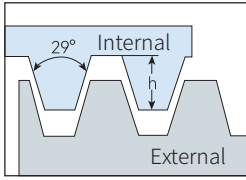


Insert size	IC	S	D1	PNA
11..	6.35	3.0	3.2	30°
16..	9.525	3.52	4.0	
22..	12.7	4.72	5.1	

Insert Below shows right hand	Designation		Pitch (mm)	Dimension (mm)	Insert Grades			
	Right hand	Left hand		PDX	AP220E	AP220U	AP020H	AP120S
	<b>11IR 150TR</b>	<b>11IL 150TR</b>	1.50	0.9		●	●	○
	<b>16IR 150TR</b>	<b>16IL 150TR</b>	1.50	1.1	●	○	●	○
	<b>16IR 200TR</b>	<b>16IL 200TR</b>	2.00	1.3	●	○	●	○
	<b>16IR 250TR</b>	<b>16IL 250TR</b>	2.50	1.4	●	○	●	○
	<b>16IR 300TR</b>	<b>16IL 300TR</b>	3.00	1.5	●	○	●	○
	<b>22IR 400TR</b>	<b>22IL 400TR</b>	4.00	1.9		●	●	○
	<b>22IR 500TR</b>	<b>22IL 500TR</b>	5.00	2.5		●	●	○
	<b>22IR 600TR</b>	<b>22IL 600TR</b>	6.00	2.7		●	●	○

● :Stocked ○ :Unstocked

## American ACME--External

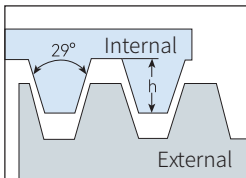


Insert size	IC	S	D1	PNA
16..	9.525	3.52	4.0	29°
22..	12.7	4.72	5.1	

Insert Below shows right hand	Designation		Threads Per Inch	Dimension (mm)	Insert Grades			
	Right hand	Left hand	TPI	PDX	AP220E	AP220U	AP020H	AP120S
	<b>16ER 16ACME</b>	<b>16EL 16ACME</b>	16	1.1		●	●	
	<b>16ER 14ACME</b>	<b>16EL 14ACME</b>	14	1.2		●	●	
	<b>16ER 12ACME</b>	<b>16EL 12ACME</b>	12	1.2		●	●	
	<b>16ER 10ACME</b>	<b>16EL 10ACME</b>	10	1.4		●	●	
	<b>16ER 8ACME</b>	<b>16EL 8ACME</b>	8	1.5		●	●	
	<b>22ER 6ACME</b>	<b>22EL 6ACME</b>	6	1.9		●	●	
	<b>22ER 5ACME</b>	<b>22EL 5ACME</b>	5	2.1		●	●	

● :Stocked ○ :Unstocked

## American ACME-Internal

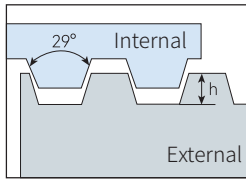


Insert size	IC	S	D1	PNA
16..	9.525	3.52	4.0	29°
22..	12.7	4.72	5.1	

Insert Below shows right hand	Designation		Threads Per Inch	Dimension (mm)	Insert Grades			
	Right hand	Left hand	TPI	PDX	AP220E	AP220U	AP020H	AP120S
	<b>16IR 16ACME</b>	<b>16IL 16ACME</b>	16	1.1		●	●	
	<b>16IR 14ACME</b>	<b>16IL 14ACME</b>	14	1.2		●	●	
	<b>16IR 12ACME</b>	<b>16IL 12ACME</b>	12	1.2		●	●	
	<b>16IR 10ACME</b>	<b>16IL 10ACME</b>	10	1.4		●	●	
	<b>16IR 8ACME</b>	<b>16IL 8ACME</b>	8	1.5		●	●	
	<b>22IR 6ACME</b>	<b>22IL 6ACME</b>	6	1.9		●	●	
	<b>22IR 5ACME</b>	<b>22IL 5ACME</b>	5	2.1		●	●	

● :Stocked ○ :Unstocked

## Stub ACME--External

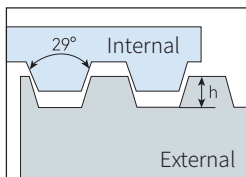


Insert size	IC	S	D1	PNA
11..	6.35	3.0	3.2	29°
16..	9.525	3.52	4.0	
22..	12.7	4.72	5.1	

Insert Below shows right hand	Designation		Threads Per Inch	Dimension (mm)	Insert Grades			
	Right hand	Left hand	TPI	PDX	AP220E	AP220U	AP020H	AP120S
	<b>11ER 16STACME</b>	<b>11EL 16STACME</b>	16	1.0		●	●	●
	<b>16ER 16STACME</b>	<b>16EL 16STACME</b>	16	1.0		●	●	●
	<b>16ER 14STACME</b>	<b>16EL 14STACME</b>	14	1.1		●	●	●
	<b>16ER 12STACME</b>	<b>16EL 12STACME</b>	12	1.2		●	●	●
	<b>16ER 10STACME</b>	<b>16EL 10STACME</b>	10	1.3		●	●	●
	<b>16ER 8STACME</b>	<b>16EL 8STACME</b>	8	1.5		●	●	●
	<b>16ER 6STACME</b>	<b>16EL 6STACME</b>	6	1.8		●	●	●
	<b>22ER 6STACME</b>	<b>22EL 6STACME</b>	6	1.8		●	●	●
	<b>22ER 5STACME</b>	<b>22EL 5STACME</b>	5	2.3		●	●	●
	<b>22ER 4STACME</b>	<b>22EL 4STACME</b>	4	2.3		●	●	●

● :Stocked ○ :Unstocked

## Stub ACME--Internal

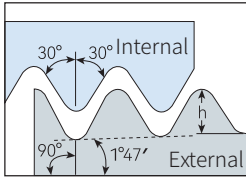


Insert size	IC	S	D1	PNA
11..	6.35	3.0	3.2	29°
16..	9.525	3.52	4.0	
22..	12.7	4.72	5.1	

Insert Below shows right hand	Designation		Threads Per Inch	Dimension (mm)	Insert Grades			
	Right hand	Left hand	TPI	PDX	AP220E	AP220U	AP020H	AP120S
	<b>11IR 16STACME</b>	<b>11IL 16STACME</b>	16	1.0		●	●	●
	<b>16IR 16STACME</b>	<b>16IL 16STACME</b>	16	1.0		●	●	●
	<b>16IR 14STACME</b>	<b>16IL 14STACME</b>	14	1.1		●	●	●
	<b>16IR 12STACME</b>	<b>16IL 12STACME</b>	12	1.2		●	●	●
	<b>16IR 10STACME</b>	<b>16IL 10STACME</b>	10	1.3		●	●	●
	<b>16IR 8STACME</b>	<b>16IL 8STACME</b>	8	1.5		●	●	●
	<b>16IR 6STACME</b>	<b>16IL 6STACME</b>	6	1.8		●	●	●
	<b>22IR 6STACME</b>	<b>22IL 6STACME</b>	6	1.8		●	●	●
	<b>22IR 5STACME</b>	<b>22IL 5STACME</b>	5	2.3		●	●	●
	<b>22IR 4STACME</b>	<b>22IL 4STACME</b>	4	2.3		●	●	●

● :Stocked ○ :Unstocked

## API Round Casing & Tubing--External



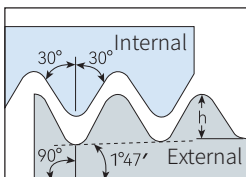
(mm)

Insert size	IC	S	D1	PNA
16..	9.525	3.52	4.0	60°

Insert Below shows right hand	Designation	Threads Per Inch	Dimension (mm)	Insert Grades			
	Right hand	TPI	PDX	AP220E	AP220U	AP020H	AP120S
	<b>16ER 10API RD</b>	<b>10</b>	1.4	○	●	○	
	<b>16ER 8API RD</b>	<b>8</b>	1.5	○	●	○	

● :Stocked ○ :Unstocked

## API Round Casing & Tubing--Internal



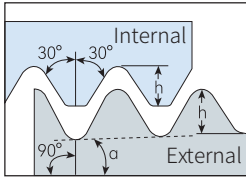
(mm)

Insert size	IC	S	D1	PNA
16..	9.525	3.52	4.0	60°

Insert Below shows right hand	Designation	Threads Per Inch	Dimension (mm)	Insert Grades			
	Right hand	TPI	PDX	AP220E	AP220U	AP020H	AP120S
	<b>16IR 10API RD</b>	<b>10</b>	1.4	○	●	○	
	<b>16IR 8API RD</b>	<b>8</b>	1.5	○	●	○	

● :Stocked ○ :Unstocked

## API--External



$$\alpha = \arctan(IPF/24)$$

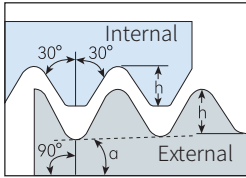
(mm)

Insert size	IC	S	D1	PNA
22..	12.7	4.72	5.1	60°

Insert Below shows right hand	Designation	Threads Per Inch	Taper	API Code	Dimension (mm)				
	Right hand	TPI	IPF		PDX	AP220E	AP220U	AP020H	AP120S
	<b>22ER 4API384</b>	<b>4</b>	<b>3</b>	V-0.038R	2.8		○	●	●
	<b>22ER 4API384-1/8</b>	<b>4</b>	<b>1.5</b>	V-0.038R	2.8		○	○	○
	<b>22ER 4API386</b>	<b>4</b>	<b>2</b>	V-0.038R	2.8		○	●	●
	<b>22ER 4API386-1/12</b>	<b>4</b>	<b>1</b>	V-0.038R	2.8		○	○	○
	<b>22ER 4API504</b>	<b>4</b>	<b>3</b>	V-0.050	2.9		○	●	●
	<b>22ER 4API504-1/8</b>	<b>4</b>	<b>1.5</b>	V-0.050	2.9		○	○	○
	<b>22ER 4API506</b>	<b>4</b>	<b>2</b>	V-0.050	2.9		○	●	●
	<b>22ER 4API506-1/12</b>	<b>4</b>	<b>1</b>	V-0.050	2.9		○	○	○
	<b>22ER 5API404</b>	<b>5</b>	<b>3</b>	V-0.040	2.6		○	○	○
	<b>22ER 5API404-1/8</b>	<b>5</b>	<b>1.5</b>	V-0.040	2.6		○	○	○
	<b>22ER 6API558</b>	<b>6</b>	<b>1.5</b>	V-0.055	2.0		○	○	○
	<b>22ER 6API558-1/16</b>	<b>6</b>	<b>0.75</b>	V-0.055	2.0		○	○	○

● : Stocked ○ : Unstocked

## API--Internal



$$\alpha = \arctan(IPF/24)$$

(mm)

Insert size	IC	S	D1	PNA
22..	12.7	4.72	5.1	60°

Insert Below shows right hand	Designation	Threads Per Inch	Taper	API Code	Dimension (mm)		Insert Grades			
	Right hand	TPI	IPF		PDX	AP220E	AP220U	AP020H	AP120S	
	<b>22IR 4API384</b>	<b>4</b>	<b>3</b>	V-0.038R	2.8		○	●	●	
	<b>22IR 4API384-1/8</b>	<b>4</b>	<b>1.5</b>	V-0.038R	2.8		○	○	○	
	<b>22IR 4API386</b>	<b>4</b>	<b>2</b>	V-0.038R	2.8		○	●	●	
	<b>22IR 4API386-1/12</b>	<b>4</b>	<b>1</b>	V-0.038R	2.8		○	○	○	
	<b>22IR 4API504</b>	<b>4</b>	<b>3</b>	V-0.050	2.9		○	●	●	
	<b>22IR 4API504-1/8</b>	<b>4</b>	<b>1.5</b>	V-0.050	2.9		○	○	○	
	<b>22IR 4API506</b>	<b>4</b>	<b>2</b>	V-0.050	2.9		○	●	●	
	<b>22IR 4API506-1/12</b>	<b>4</b>	<b>1</b>	V-0.050	2.9		○	○	○	
	<b>22IR 5API404</b>	<b>5</b>	<b>3</b>	V-0.040	2.6		○	○	○	
	<b>22IR 5API404-1/8</b>	<b>5</b>	<b>1.5</b>	V-0.040	2.6		○	○	○	
	<b>22IR 6API558</b>	<b>6</b>	<b>1.5</b>	V-0.055	2.0		○	○	○	
	<b>22IR 6API558-1/16</b>	<b>6</b>	<b>0.75</b>	V-0.055	2.0		○	○	○	

● : Stocked ○ : Unstocked

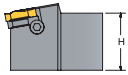
## Threading holder code system


<b>ATT</b> 1	<b>E</b> 2	<b>R</b> 3	<b>25</b> 4	<b>25</b> 5	<b>M</b> 6	<b>-</b>	<b>16</b> 7	<b>C</b> 8
-----------------	---------------	---------------	----------------	----------------	---------------	----------	----------------	---------------

1-Serial code
Thread Turning holder

2-Holder type
E-- For External
I--For Internal

3-Hand of holder
R--Right hand
L--Left hand

4-Height of shank
 <p>25=25mm 00--Round rod</p>

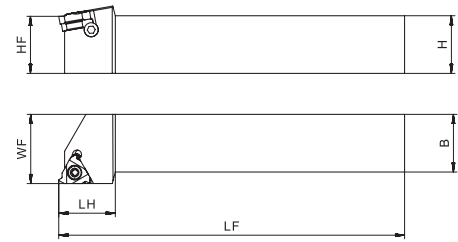
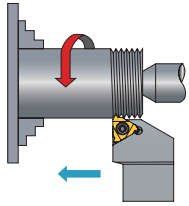
5-Width of shank Or Dcon
 <p>25=25mm</p>

6-Length of holder (mm)
H=100mm
K=125mm
L=140mm
M=150mm
P=170mm
Q=180mm
R=200mm
S=250mm
T=300mm
U=350mm
V=400mm

7-Insert size
16-- L=16mm / IC=9.525mm

8-Clamping system
None---Steel with screw lock
E---Carbide with screw lock
C---Steel with Clamp
J---Cooling channel & Steel with screw lock
JE--Cooling channel & Carbide with screw lock
CS--Steel with Clamp & Deflection 90°

## External thread holders

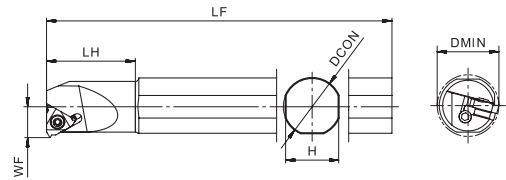
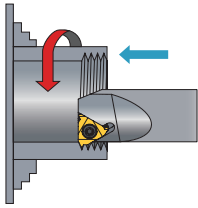


Designation	Right hand	Left hand	Dimension (mm)					Insert	Screw	Shim	Screw of shim	Wrench
			H*B	HF	WF	LF	LH					
ATTER/L-1212H-11	●	●	12*12	12	16	100	15	11ER/L ..	ST025080	-	-	FT-T08
ATTER/L-1212F-16	●	-	12*12	12	16	80	22	16ER/L ..	ST035090	-	-	FT-T15
ATTER/L-1616H-16	○	○	16*16	16	20	100	22					
ATTER/L-2020K-16	●	●	20*20	20	25	125	27					
ATTER/L-2525M-16	●	●	25*25	25	32	150	30		ST035120	S-MTN16	SH030080	
ATTER/L-3225P-16	●	-	32*25	32	32	170	32					
ATTER/L-3232P-16	●	●	32*32	32	40	170	32					
ATTER/L-2525M-22	○	○	25*25	25	32	150	31	22ER/L ..	ST040160	S-MTN22	SH040080	FT-T20
ATTER/L-3225P-22	○	-	32*25	32	32	170	31					
ATTER/L-3232P-22	○	○	32*32	32	40	170	31					
ATTER/L-4040R-22	○	-	40*40	40	50	200	31					
ATTER/L-3232P-27	○	○	32*32	32	40	170	34	27ER/L ..	ST050200	S-MTN27		
ATTER/L-4040S-27	○	-	40*40	40	50	250	34					

● :Stocked ○ :Unstocked

\*Threading holders equipped with 0° shim, screw and wrench ; Insert need to be ordered separately

## Internal thread holders



Designation	Right hand	Left hand	Dimension (mm)						Insert	Screw	Shim	Screw of shim	Wrench
			DMIN	DCON	H	WF	LF	LH					
ATTIR/L-0008K-08	○	-	9.9	8	7	5.5	125	20	08IR/L ..	ST022050			FT-T06
ATTIR/L-0010K-11	○	○	13	10	9	7.3	125	25	11IR/L ..	ST025060	-	-	FT-T08
ATTIR/L-0012K-11	○	○	15	12	11	8.2	125	28					
ATTIR/L-0013M-16	○	○	17	16	15	9.4	150	32	16IR/L ..	ST035090			FT-T15
ATTIR/L-0016Q-16	●	●	20	16	15	11.7	180	40					
ATTIR/L-0020Q-16	●	●	24	20	18	13.7	180	40					
ATTIR/L-0025R-16	●	●	29	25	23	16.2	200	45		ST035120	S-STN16	SH030080	
ATTIR/L-0032S-16	●	●	36	32	30	19.7	250	50					
ATTIR/L-0040T-16	○	○	44	40	38	23.1	300	55					
ATTIR/L-0050U-16	○	○	56	50	48	28.7	350	60					
ATTIR/L-0025R-22	○	○	32	25	23	18.1	200	45	22IR/L ..	ST040160	S-STN22	SH040080	FT-T20
ATTIR/L-0032S-22	○	○	39	32	30	21.5	250	50					
ATTIR/L-0040T-22	○	○	47	40	38	25.6	300	55					
ATTIR/L-0050U-22	○	○	57	50	48	30.6	350	70					
ATTIR/L-0032S-27	○	○	40	32	30	22.4	250	60	27IR/L ..		S-STN27		
ATTIR/L-0040T-27	○	○	48	40	38	26.4	300	60					
ATTIR/L-0050U-27	○	-	58	50	48	32.2	350	70					

● :Stocked ○ :Unstocked

\*Threading holders equipped with 0° shim, screw and wrench ; Insert need to be ordered separately

## • Technical Information for Thread turning

### Helix angle

The relationship between the diameter of the thread and the thread pitch, produces the Helix angle. Thread turning belongs to forming processing and multi edge cutting, it is necessary to use the threading holder and angle of the shim to tilt the inserts and obtain the same clearance angle on both sides of the cutting edge (as shown in Figure 1).

### Calculation Method for Helix angle

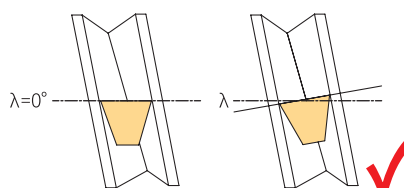
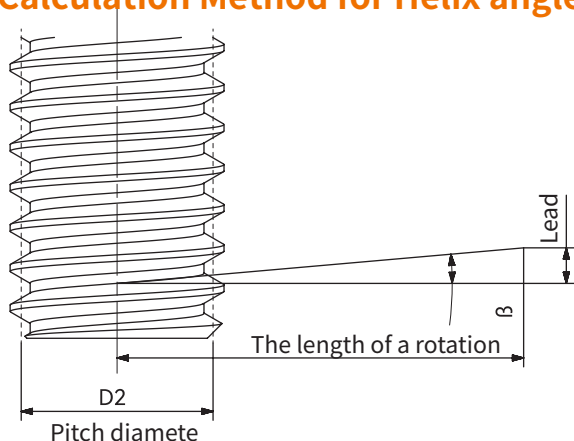


Figure 1

$$\beta = \arctan \frac{P \times N}{\pi \times D2}$$

$\beta$  ... Helix angle  
 $P$  ... Thread pitch  
 $D2$  ... Pitch diameter  
 $N$  ... Number of threading starts

- \* When  $\lambda$  approaches  $\beta$ , it can effectively improve the precision of threading and prevent cutting edge breakage. Through calculation, it is very important to choose the appropriate Angle of the shim

### Reference to Helix angle

Helix angle Thread pitch (mm)	Right handed thread (mm)						Left handed thread (mm)		
	Can't machine	4.5°	3.5°	2.5°	1.5°	0.5°	Can't machine	-1.5°	-0.5°
0.50	≤Ø1.9	Ø1.9--Ø2.2	Ø2.2--Ø2.8	Ø2.8--Ø4.3	Ø4.3--Ø11.4	≥Ø11.4	≤Ø4.3	≤Ø4.3--Ø11.4	≥Ø11.4
0.75	≤Ø2.9	Ø2.9--Ø3.2	Ø3.2--Ø4.3	Ø4.3--Ø6.5	Ø6.5--Ø17.1	≥Ø17.1	≤Ø6.5	≤Ø6.5--Ø17.1	≥Ø17.1
1.00	≤Ø3.8	Ø3.8--Ø4.3	Ø4.3--Ø5.7	Ø5.7--Ø8.7	Ø8.7--Ø22.8	≥Ø22.8	≤Ø8.7	≤Ø8.7--Ø22.8	≥Ø22.8
1.25	≤Ø4.8	Ø4.8--Ø5.4	Ø5.4--Ø7.1	Ø7.1--Ø10.9	Ø10.9--Ø28.5	≥Ø28.5	≤Ø10.9	≤Ø10.9--Ø28.5	≥Ø28.5
1.50	≤Ø5.7	Ø5.7--Ø5.5	Ø6.5--Ø8.5	Ø8.5--Ø13.0	Ø13.0--Ø34.2	≥Ø34.2	≤Ø13.0	≤Ø13.0--Ø34.2	≥Ø34.2
1.75	≤Ø6.7	Ø6.7--Ø7.6	Ø7.6--Ø9.9	Ø9.9--Ø15.2	Ø15.2--Ø39.9	≥Ø39.9	≤Ø15.2	≤Ø15.2--Ø39.9	≥Ø39.9
2.00	≤Ø7.6	Ø7.6--Ø8.6	Ø8.6--Ø11.4	Ø11.4--Ø17.4	Ø17.4--Ø45.6	≥Ø45.6	≤Ø17.4	≤Ø17.4--Ø45.6	≥Ø45.6
2.50	≤Ø9.5	Ø9.5--Ø10.8	Ø10.9--Ø14.2	Ø14.2--Ø21.7	Ø21.7--Ø57.0	≥Ø57.0	≤Ø21.7	≤Ø21.7--Ø57.0	≥Ø57.0
3.00	≤Ø11.4	Ø11.4--Ø13.0	Ø13.0--Ø17.0	Ø17.0--Ø26.0	Ø26.0--Ø68.4	≥Ø68.4	≤Ø26.0	≤Ø26.0--Ø68.4	≥Ø68.4
3.50	≤Ø13.3	Ø13.3--Ø15.1	Ø15.1--Ø19.9	Ø19.9--Ø30.4	Ø30.4--Ø79.8	≥Ø79.8	≤Ø30.4	≤Ø30.4--Ø79.8	≥Ø79.8
4.00	≤Ø15.2	Ø15.2--Ø17.3	Ø17.3--Ø22.7	Ø22.7--Ø34.7	Ø34.7--Ø91.2	≥Ø91.2	≤Ø34.7	≤Ø34.7--Ø91.2	≥Ø91.2
4.50	≤Ø17.1	Ø17.1--Ø19.4	Ø19.4--Ø25.6	Ø25.6--Ø39.1	Ø39.1--Ø102.6	≥Ø102.6	≤Ø39.1	≤Ø39.1--Ø102.6	≥Ø102.6
5.00	≤Ø19.0	Ø19.0--Ø21.6	Ø21.6--Ø28.4	Ø28.4--Ø43.4	Ø43.4--Ø114.0	≥Ø114.0	≤Ø43.4	≤Ø43.4--Ø114.0	≥Ø114.0

## Infeed & Depth of cutting

### ISO Metric--External

Ph	6	5.5	5	4.5	4	3.5	3	2.5	2	1.75	1.5	1.25	1	0.8	0.75	0.5
a p	3,82	3,52	3,19	2,87	2,53	2,23	1,92	1,60	1,25	1,13	0,93	0,81	0,65	0,52	0,48	0,33
1	0,46	0,43	0,41	0,37	0,34	0,34	0,28	0,27	0,24	0,22	0,22	0,21	0,18	0,17	0,16	0,11
2	0,43	0,40	0,39	0,34	0,32	0,31	0,26	0,24	0,22	0,20	0,20	0,17	0,16	0,15	0,14	0,09
3	0,35	0,32	0,32	0,28	0,25	0,25	0,21	0,20	0,18	0,17	0,17	0,14	0,12	0,12	0,11	0,07
4	0,30	0,28	0,27	0,24	0,22	0,21	0,18	0,17	0,16	0,14	0,14	0,11	0,11	0,08	0,07	0,06
5	0,29	0,26	0,24	0,22	0,20	0,18	0,16	0,15	0,14	0,12	0,12	0,10	0,08	-	-	-
6	0,26	0,24	0,24	0,22	0,18	0,18	0,15	0,15	0,12	0,10	0,08	0,08	-	-	-	-
7	0,24	0,21	0,22	0,20	0,17	0,16	0,14	0,12	0,11	0,10	-	-	-	-	-	-
8	0,23	0,20	0,20	0,18	0,15	0,15	0,13	0,11	0,08	0,08	-	-	-	-	-	-
9	0,22	0,19	0,19	0,17	0,14	0,14	0,12	0,11	-	-	-	-	-	-	-	-
10	0,19	0,18	0,18	0,16	0,13	0,12	0,11	0,08	-	-	-	-	-	-	-	-
11	0,18	0,17	0,16	0,14	0,12	0,11	0,10	-	-	-	-	-	-	-	-	-
12	0,16	0,15	0,15	0,13	0,12	0,08	0,08	-	-	-	-	-	-	-	-	-
13	0,15	0,14	0,12	0,12	0,11	-	-	-	-	-	-	-	-	-	-	-
14	0,13	0,13	0,10	0,10	0,08	-	-	-	-	-	-	-	-	-	-	-
15	0,13	0,12	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16	0,10	0,10	-	-	-	-	-	-	-	-	-	-	-	-	-	-

### ISO Metric--Internal

Ph	6	5.5	5	4.5	4	3.5	3	2.5	2	1.75	1.5	1.25	1	0.8	0.75	0.5
a p	3,54	3,25	2,96	2,65	2,33	2,05	1,78	1,48	1,17	1,05	0,85	0,75	0,60	0,49	0,46	0,31
1	0,46	0,43	0,42	0,37	0,34	0,32	0,28	0,26	0,23	0,22	0,20	0,17	0,17	0,17	0,16	0,10
2	0,43	0,40	0,40	0,34	0,31	0,30	0,26	0,25	0,21	0,20	0,18	0,17	0,15	0,14	0,13	0,08
3	0,35	0,33	0,32	0,28	0,24	0,24	0,21	0,18	0,17	0,15	0,15	0,14	0,11	0,11	0,10	0,07
4	0,30	0,26	0,26	0,23	0,21	0,19	0,16	0,15	0,15	0,13	0,13	0,10	0,09	0,07	0,07	0,06
5	0,26	0,22	0,22	0,21	0,18	0,17	0,14	0,13	0,12	0,10	0,11	0,09	0,08	-	-	-
6	0,22	0,20	0,20	0,19	0,15	0,15	0,13	0,12	0,11	0,09	0,08	0,08	-	-	-	-
7	0,20	0,18	0,17	0,16	0,14	0,14	0,12	0,11	0,10	0,08	-	-	-	-	-	-
8	0,19	0,17	0,16	0,15	0,13	0,13	0,11	0,10	0,08	0,08	-	-	-	-	-	-
9	0,18	0,16	0,16	0,14	0,12	0,12	0,10	0,10	-	-	-	-	-	-	-	-
10	0,16	0,15	0,15	0,13	0,12	0,11	0,10	0,08	-	-	-	-	-	-	-	-
11	0,15	0,14	0,14	0,12	0,11	0,10	0,09	-	-	-	-	-	-	-	-	-
12	0,15	0,14	0,14	0,12	0,10	0,08	0,08	-	-	-	-	-	-	-	-	-
13	0,14	0,13	0,12	0,11	0,10	-	-	-	-	-	-	-	-	-	-	-
14	0,13	0,12	0,10	0,10	0,08	-	-	-	-	-	-	-	-	-	-	-
15	0,12	0,12	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16	0,10	0,10	-	-	-	-	-	-	-	-	-	-	-	-	-	-

### Whitworth--External & Internal

TPI	4	4.5	5	6	7	8	9	10	11	12	14	16	18	19	20	26	28
a p	4,29	3,82	3,44	2,90	2,50	2,17	1,93	1,76	1,58	1,45	1,20	1,13	1,01	0,96	0,92	0,72	0,69
1	0,49	0,46	0,45	0,38	0,37	0,32	0,30	0,29	0,28	0,28	0,24	0,24	0,23	0,22	0,21	0,19	0,18
2	0,46	0,43	0,43	0,36	0,35	0,30	0,28	0,27	0,26	0,26	0,22	0,22	0,22	0,22	0,21	0,18	0,17
3	0,38	0,38	0,38	0,30	0,29	0,24	0,23	0,22	0,22	0,22	0,18	0,19	0,19	0,18	0,17	0,15	0,14
4	0,36	0,33	0,32	0,26	0,25	0,21	0,20	0,19	0,19	0,18	0,15	0,16	0,16	0,14	0,14	0,12	0,12
5	0,34	0,29	0,28	0,22	0,22	0,19	0,18	0,17	0,16	0,16	0,13	0,13	0,13	0,12	0,11	0,08	0,08
6	0,31	0,25	0,25	0,21	0,19	0,17	0,15	0,15	0,14	0,14	0,11	0,11	0,08	0,08	0,08	-	-
7	0,29	0,24	0,22	0,19	0,18	0,15	0,14	0,14	0,13	0,13	0,09	0,08	-	-	-	-	-
8	0,27	0,22	0,20	0,17	0,16	0,14	0,13	0,13	0,12	0,08	0,08	-	-	-	-	-	-
9	0,24	0,20	0,19	0,16	0,15	0,13	0,12	0,12	0,08	-	-	-	-	-	-	-	-
10	0,22	0,18	0,18	0,15	0,14	0,12	0,12	0,08	-	-	-	-	-	-	-	-	-
11	0,20	0,17	0,17	0,14	0,12	0,12	0,08	-	-	-	-	-	-	-	-	-	-
12	0,19	0,16	0,15	0,14	0,08	0,08	-	-	-	-	-	-	-	-	-	-	-
13	0,17	0,15	0,12	0,12	-	-	-	-	-	-	-	-	-	-	-	-	-
14	0,15	0,14	0,10	0,10	-	-	-	-	-	-	-	-	-	-	-	-	-
15	0,12	0,12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16	0,10	0,10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

\*Ph = Lead (mm)

\*ap = Total depth of cutting (mm)

\*TPI = Threads Per Inch

\*The above recommended values are used for steel with hardness < 300 HB, if the insert breakage, it is recommended to increase the number of infeed

## Infeed & Depth of cutting

### American UN--External

TPI	4	4.5	5	6	7	8	9	10	11	12	13	14	16	18	20	24	28	32
a p	4,07	3,62	3,29	2,71	2,33	2,08	1,84	1,66	1,52	1,39	1,29	1,19	1,05	0,94	0,84	0,70	0,60	0,53
1	0,47	0,45	0,43	0,36	0,35	0,30	0,28	0,27	0,27	0,27	0,25	0,23	0,22	0,23	0,20	0,19	0,17	0,17
2	0,44	0,41	0,40	0,34	0,33	0,28	0,26	0,26	0,25	0,26	0,24	0,22	0,21	0,21	0,19	0,17	0,15	0,15
3	0,40	0,39	0,36	0,27	0,26	0,25	0,21	0,20	0,20	0,20	0,18	0,17	0,16	0,16	0,15	0,14	0,11	0,13
4	0,36	0,31	0,31	0,23	0,22	0,21	0,20	0,17	0,19	0,18	0,17	0,15	0,14	0,14	0,12	0,12	0,09	0,08
5	0,32	0,26	0,26	0,22	0,21	0,18	0,17	0,16	0,16	0,15	0,14	0,13	0,13	0,12	0,10	0,08	0,08	-
6	0,27	0,23	0,23	0,20	0,19	0,16	0,15	0,15	0,14	0,13	0,12	0,11	0,11	0,08	0,08	-	-	-
7	0,25	0,21	0,20	0,18	0,17	0,14	0,14	0,14	0,12	0,12	0,11	0,10	0,08	-	-	-	-	-
8	0,23	0,20	0,19	0,16	0,15	0,13	0,12	0,12	0,11	0,08	0,08	0,08	-	-	-	-	-	-
9	0,22	0,18	0,19	0,15	0,14	0,12	0,12	0,11	0,08	-	-	-	-	-	-	-	-	-
10	0,21	0,17	0,18	0,14	0,12	0,12	0,11	0,08	-	-	-	-	-	-	-	-	-	-
11	0,19	0,16	0,17	0,13	0,11	0,11	0,08	-	-	-	-	-	-	-	-	-	-	-
12	0,18	0,15	0,15	0,12	0,08	0,08	-	-	-	-	-	-	-	-	-	-	-	-
13	0,16	0,14	0,12	0,11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14	0,15	0,14	0,10	0,10	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15	0,12	0,12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16	0,10	0,10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

### American UN--Internal

TPI	4	4.5	5	6	7	8	9	10	11	12	13	14	16	18	20	24	28	32
a p	3,74	3,32	2,99	2,46	2,13	1,88	1,66	1,49	1,36	1,25	1,14	1,06	0,93	0,84	0,76	0,64	0,56	0,49
1	0,44	0,41	0,42	0,35	0,34	0,30	0,28	0,27	0,27	0,27	0,25	0,23	0,22	0,23	0,20	0,18	0,17	0,17
2	0,41	0,38	0,38	0,33	0,32	0,28	0,26	0,25	0,23	0,23	0,20	0,18	0,18	0,17	0,16	0,15	0,14	0,14
3	0,39	0,34	0,33	0,25	0,24	0,22	0,19	0,18	0,18	0,18	0,15	0,14	0,14	0,14	0,13	0,13	0,09	0,10
4	0,33	0,28	0,27	0,21	0,21	0,18	0,16	0,15	0,15	0,15	0,13	0,13	0,12	0,12	0,10	0,10	0,08	0,08
5	0,28	0,23	0,23	0,18	0,17	0,15	0,14	0,13	0,13	0,13	0,12	0,11	0,10	0,10	0,09	0,08	0,08	-
6	0,24	0,20	0,20	0,16	0,15	0,13	0,13	0,12	0,11	0,11	0,11	0,10	0,09	0,08	0,08	-	-	-
7	0,22	0,19	0,18	0,15	0,14	0,12	0,12	0,11	0,11	0,10	0,10	0,09	0,08	-	-	-	-	-
8	0,21	0,18	0,17	0,14	0,13	0,11	0,11	0,10	0,10	0,08	0,08	0,08	-	-	-	-	-	-
9	0,20	0,17	0,16	0,13	0,12	0,11	0,10	0,10	0,08	-	-	-	-	-	-	-	-	-
10	0,18	0,16	0,15	0,12	0,12	0,10	0,09	0,08	-	-	-	-	-	-	-	-	-	-
11	0,17	0,15	0,14	0,12	0,11	0,10	0,08	-	-	-	-	-	-	-	-	-	-	-
12	0,16	0,14	0,14	0,11	0,08	0,08	-	-	-	-	-	-	-	-	-	-	-	-
13	0,15	0,14	0,12	0,11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14	0,14	0,13	0,10	0,10	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15	0,12	0,12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16	0,10	0,10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

### NPT--External & Internal

TPI	8	11,5	14	18	27
a p	2,54	1,76	1,45	1,12	0,75
1	0,28	0,25	0,24	0,22	0,19
2	0,25	0,22	0,22	0,18	0,15
3	0,22	0,18	0,17	0,15	0,13
4	0,19	0,16	0,15	0,14	0,11
5	0,18	0,16	0,14	0,13	0,09
6	0,18	0,14	0,13	0,12	0,08
7	0,17	0,14	0,12	0,10	-
8	0,17	0,12	0,10	0,08	-
9	0,16	0,12	0,10	-	-
10	0,16	0,10	0,08	-	-
11	0,14	0,09	-	-	-
12	0,13	0,08	-	-	-
13	0,12	-	-	-	-
14	0,11	-	-	-	-
15	0,08	-	-	-	-

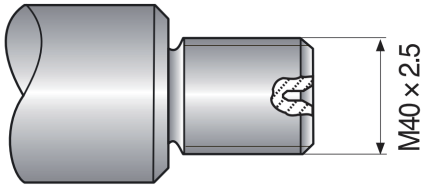
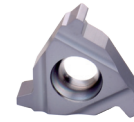
\*Ph = Lead (mm)

\*ap = Total depth of cutting (mm)

\*TPI = Threads Per Inch

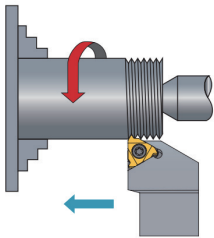
\*The above recommended values are used for steel with hardness < 300 HB, if the insert breakage, it is recommended to increase the number of infeed

## • Thread turning (basic type) tool selection steps



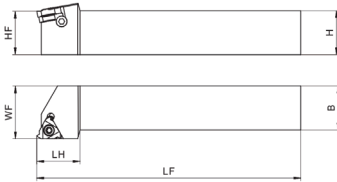
Thread: M40X2.5 ISO thread with one number of threading, external thread and right-hand  
Materials: C45 carbon steel

### 1. Choose the thread turning method



Note: Threading holder, full profile thread insert, machine spindle rotation direction, feed direction, will determine our method of thread turning. Suppose the thread turning method as shown on the left.

### 2. Choose the threading holder

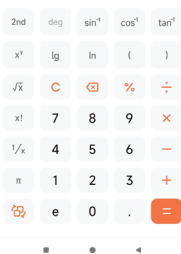


According to the requirements of holder width, length and avoidance space, select the type of the threading holder. If using the customer's on-site holder, pay attention to tip height of alignment center. Low tip height will reduce the strength of the insert, cause vibration and cutting edge breakage.

### 3. Calculate the Helix angle and select the shim with the right angle

$$\arctan(2.5 \div (3.14 \times 40))$$

$$= 1.140290897450339116^\circ$$



$$\beta = \arctan \frac{PxN}{T \times D2}$$

- $\beta$  ... Helix angle
- P ... Thread pitch
- D2 ... Pitch diameter
- N ... Number of threading starts

Calculate the Helix angle or check the «Reference to Helix angle» to determine whether the shim need to be replaced. In this example, if the customer chooses Achteck tools, the holder already have 1.5° inclination angle, and the normal selection of 0° shim can be complete. Improper shim angle will lead to vibration, cutting edge breakage and unqualified thread size.

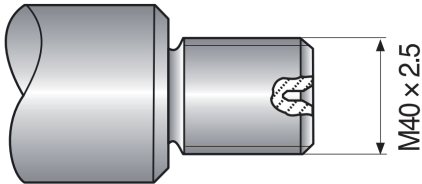
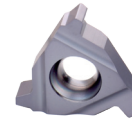
### 4. Choose the Infeed & Depth of cutting

ISO- 公制外螺纹

Ph	6	5.5	5	4.5	4	3.5	3	2.5	2
ap	3.82	3.52	3.19	2.87	2.53	2.23	1.92	1.60	1.25
1	0.46	0.43	0.41	0.37	0.34	0.34	0.28	0.27	0.24
2	0.43	0.40	0.39	0.34	0.32	0.31	0.26	0.24	0.22
3	0.35	0.32	0.32	0.28	0.25	0.25	0.21	0.20	0.18
4	0.30	0.28	0.27	0.24	0.22	0.21	0.18	0.17	0.16
5	0.29	0.26	0.24	0.22	0.20	0.18	0.16	0.15	0.14
6	0.26	0.24	0.24	0.22	0.18	0.18	0.15	0.15	0.12
7	0.24	0.21	0.22	0.20	0.17	0.16	0.14	0.12	0.11
8	0.23	0.20	0.20	0.18	0.15	0.15	0.13	0.11	0.08
9	0.22	0.19	0.19	0.17	0.14	0.14	0.12	0.11	-
10	0.19	0.18	0.18	0.16	0.13	0.12	0.11	0.08	-
11	0.18	0.17	0.16	0.14	0.12	0.11	0.10	-	-
12	0.16	0.15	0.15	0.13	0.12	0.08	0.08	-	-
13	0.15	0.14	0.12	0.12	0.11	-	-	-	-
14	0.13	0.13	0.10	0.10	0.08	-	-	-	-
15	0.13	0.12	-	-	-	-	-	-	-
16	0.10	0.10	-	-	-	-	-	-	-

According to the corresponding thread type, pitch, tooth height information, Select the recommended Infeed & Depth of cutting. For HB > 300 steel, stainless steel, superalloy and other materials, it is necessary to increase the number of feed times and reduce the cutting depth to prevent the cutting edge breakage.

## • Thread turning (basic type) tool selection steps



Thread: M40X2.5 ISO thread with one number of threading, external thread and right-hand  
Materials: C45 carbon steel

### 5. Choose the cutting data

Workpiece Materials		Brinell Hardness (HB)	AP220E
P	Non-alloy steel	120-170	60-200
	Low-alloy steel	180-350	60-160
	High-alloy steel	200-325	50-120

If you do not know the specific information of the workpiece clamping and workpiece surface at the customer site,  $V_c = (60 + 200) / 2 = 130 \text{ m/min}$  is recommended according to the experience value

### 6. List of recommended cutting tools

Information	M40X2.5 ISO thread with one number of threading, external thread and right-hand
Materials	C45 carbon steel
Feed direction	Towards the chuck
Insert and Grade	16ER 250ISO AP220E
Threading holder	ATTER 2525M-16
Helix angle	$\beta = 1.14$
Shim angle	$\beta$ minus the tilt angle of the holder, the approximate value is $0^\circ$ Shim
Cutting speed	130 m/min
Infeed	Radial infeed
Number of infeed	10
Depth of cutting	0.27/0.24/0.20/0.17/0.15/0.15/0.12/0.11/0.11/0.08