

THREAD MILLING TOOLS



Product Identification

Thread Milling Insert - Ordering Code

1

21

2

E

3

1.50

4

ISO

1

Insert Size

12

L=12mm

14

L=14mm

21

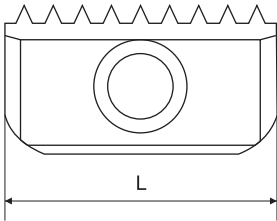
L=21mm

30

L=30mm

40

L=40mm



2

Application

E

= External

N

= Internal

-

= Ext + Int

3

Pitch

Full Profile

mm

TPI

0.5~6

48~4

4

Standard

ISO

60° ISO Metric

UN

60° American UN

W

55° Whitworth for BSW BSP

NPT

60° NPT

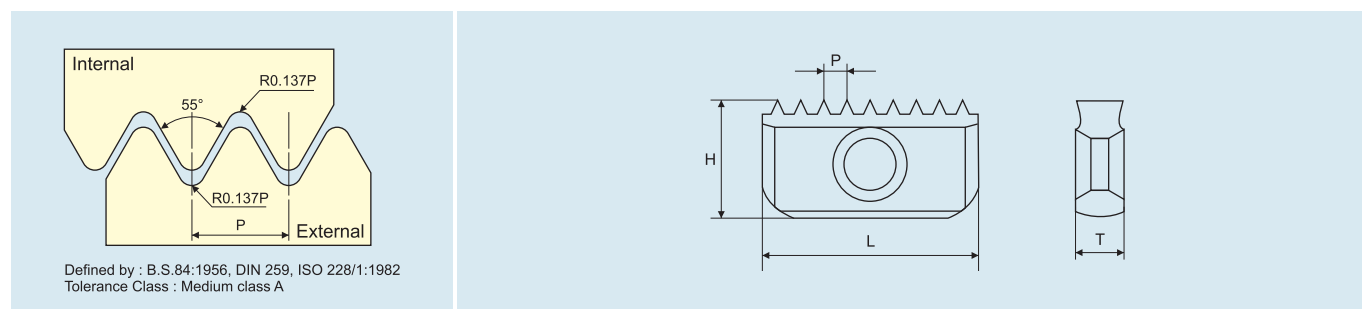
NPTF

60° NPTF

BSPT

55° British Standard Pipe Thread

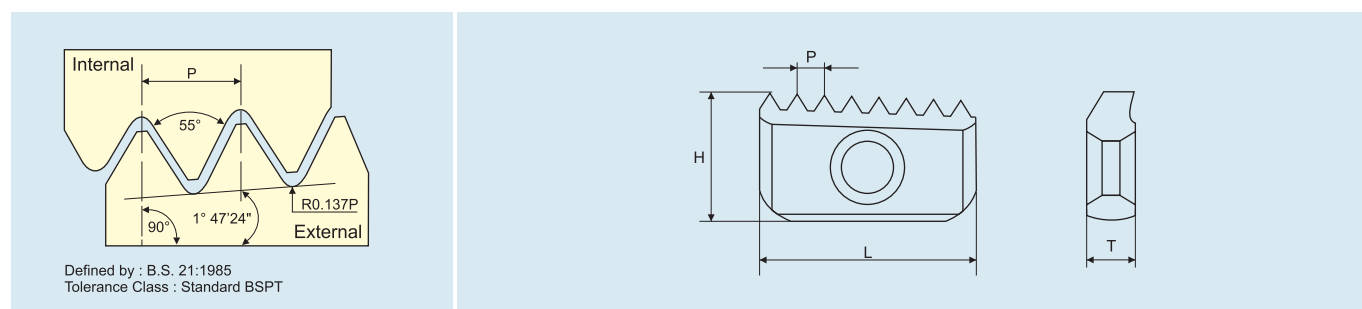
W-55° Whitworth Full Profile



Pitch TPI	Ordering Code				
	L=12mm	L=14mm	L=21mm	L=30mm	L=40mm
24		14-24W			
20		14-20W	21-20W		
19	*12-19W	14-19W	21-19W		
16		14-16W	21-16W	30-16W	
14		14-14W	21-14W	30-14W	
11			21-11W	30-11W	40-11W
8					40-8W

* Insert with one cutting edge.
Same Insert for External and Internal Threading.

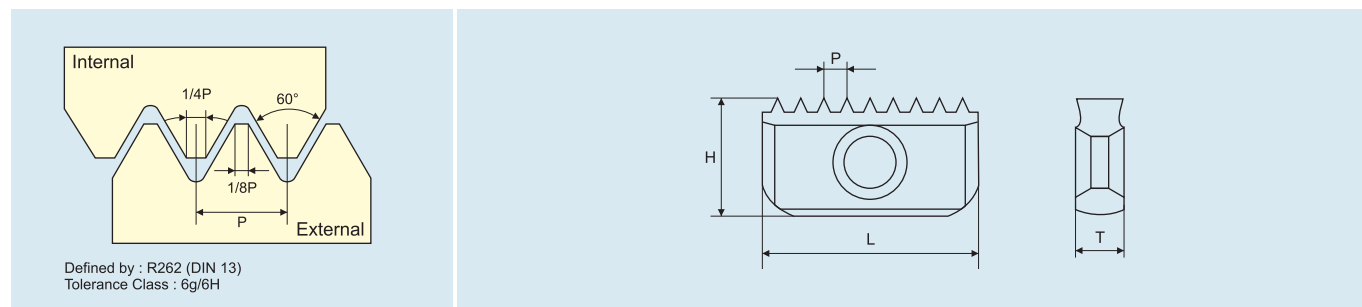
BSPT-55° British standard pipe full profile



Pitch TPI	Insert Size A				
	L=12mm	L=14mm	L=21mm	L=30mm	L=40mm
19	*12-19BSPT	14-19BSPT			
14		14-14BSPT	21-14BSPT		
11			21-11BSPT	30-11PSPT	40-11BSPT

* Insert with one cutting edge.
Conical Pipe Thread Inserts are one sided and may be used for both External and Internal Threading.

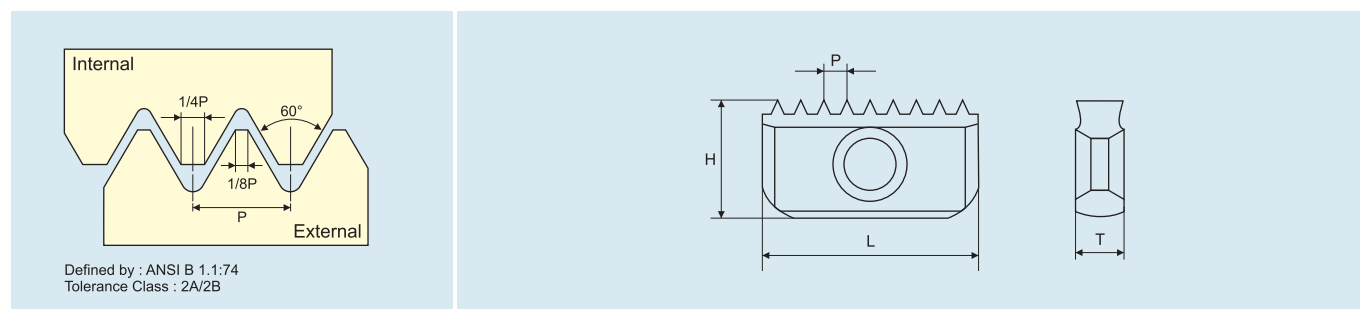
ISO-60° Metric Full Profile



Pitch TPI		Ordering Code				
		L=12mm	L=14mm	L=21mm	L=30mm	L=40mm
0.5	Ext					
	Int	*12N0.5ISO	14N0.5ISO			
0.75	Ext		14E0.75ISO			
	Int	*12N0.75ISO	14N0.75ISO			
1.0	Ext		14E1.0ISO	21E1.0ISO		
	Int	*12N1.0ISO	14N1.0ISO	21N1.0ISO		
1.25	Ext		14E1.25ISO			
	Int	*12N1.25ISO	14N1.25ISO			
1.5	Ext		14E1.5ISO	21E1.5ISO	30E1.5ISO	40E1.5ISO
	Int	*12N1.5ISO	14N1.5ISO	21N1.5ISO	30N1.5ISO	40N1.5ISO
1.75	Ext		14E1.75ISO			
	Int		14N1.75ISO	21N1.75ISO		
2.0	Ext		14E2.0ISO	21E2.0ISO	30E2.0ISO	40E2.0ISO
	Int		14N2.0ISO	21N2.0ISO	30N2.0ISO	40N2.0ISO
2.5	Ext		14E2.5ISO	21E2.5ISO		
	Int		14N2.5ISO	21N2.5ISO		
3.0	Ext			21E3.0ISO	30E3.0ISO	40E3.0ISO
	Int			21N3.0ISO	30N3.0ISO	40N3.0ISO
3.5	Ext				30E3.5ISO	
	Int			21N3.5ISO	30N3.5ISO	40N3.5ISO
4.0	Ext				30E4.0ISO	40E4.0ISO
	Int				30N4.0ISO	40N4.0ISO
4.5	Ext					
	Int				30N4.5ISO	40N4.5ISO
5.0	Ext					40E5.0ISO
	Int					40N5.0ISO
5.5	Ext					
	Int					40N5.5ISO
6.0	Ext					40E6.0ISO
	Int					40N6.0ISO
H		6.3	7.5	12	16	20
T		2.9	3.1	4.7	5.5	6.3

* Insert with one cutting edge

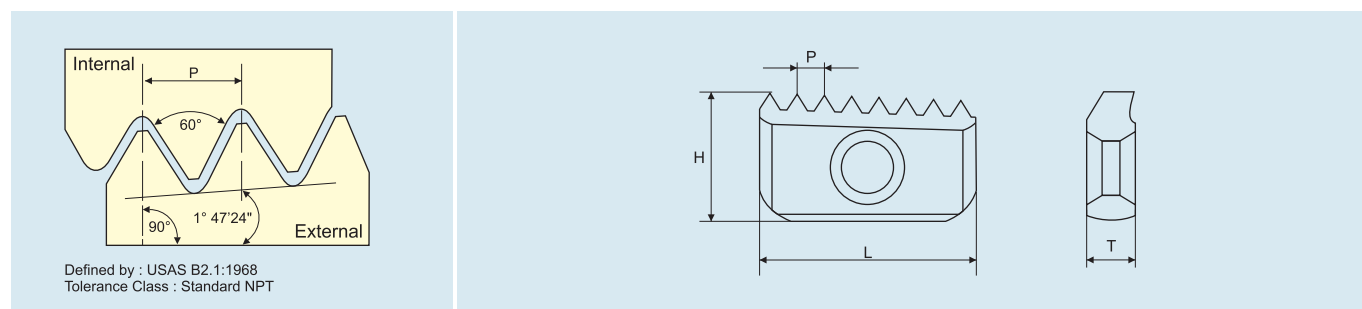
UN-60° American UN Full Profile



Pitch TPI		Ordering Code				
		L=12mm	L=14mm	L=21mm	L=30mm	L=40mm
32	Ext		14E32UN			
	Int	*12N32UN	14N32UN			
28	Ext		14E28UN			
	Int	*12N28UN	14N28UN			
27	Ext					
	Int		14N27UN			
24	Ext		14E24UN	21E24UN		
	Int	*12N24UN	14N24UN	21N24UN		
20	Ext		14E20UN	21E20UN	30E20UN	
	Int	*12N20UN	14N20UN	21N20UN	30N20UN	
18	Ext		14E18UN	21E18UN	30E18UN	
	Int	*12N18UN	14N18UN	21N18UN	30N18UN	
16	Ext		14E16UN	21E16UN	30E16UN	40E16UN
	Int	*12N16UN	14N16UN	21N16UN	30N16UN	40N16UN
14	Ext		14E14UN	21E14UN	30E14UN	40E14UN
	Int		14N14UN	21N14UN	30N14UN	40N14UN
12	Ext		14E12UN	21E12UN	30E12UN	40E12UN
	Int		14N12UN	21N12UN	30N12UN	40N12UN
10	Ext			21E10UN	30E10UN	40E10UN
	Int			21N10UN	30N10UN	40N10UN
8	Ext				30E8UN	40E8UN
	Int			21N8UN	30N8UN	40N8UN
6	Ext				30E6UN	40E6UN
	Int				30N6UN	40N6UN
4.5	Ext					
	Int					40N4.5UN
4	Ext					
	Int					40N4UN
H		6.3	7.5	12	16	20
T		2.9	3.1	4.7	5.5	6.3

* Insert with one cutting edge

NPT-60° National Pipe Threads

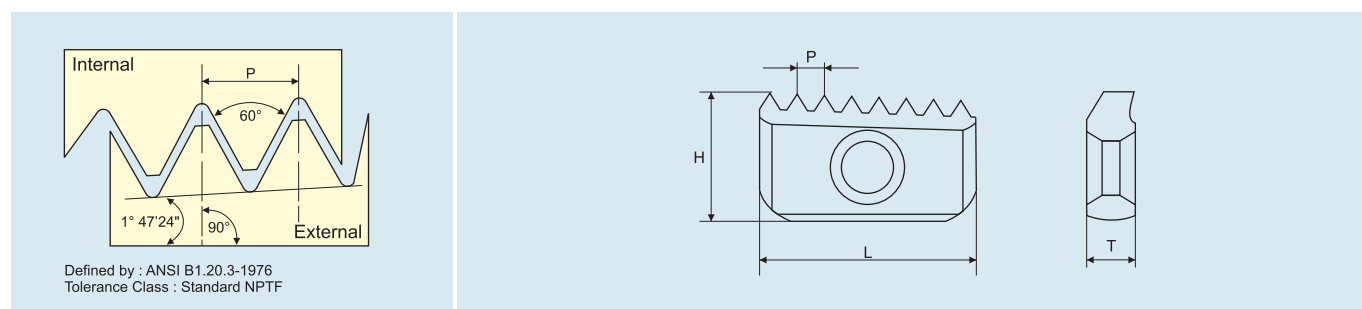


Pitch TPI	Ordering Code				
	L=12mm	L=14mm	L=21mm	L=30mm	L=40mm
18	*12-18NPT	14-18NPT			
14		14-14NPT	21-14NPT		
11.5			21-11.5NPT	30-11.5NPT	40-11.5NPT
8				30-8NPT	40-8NPT

* Insert with one cutting edge.

Conical Pipe Thread Inserts are one sided and may be used for both External and Internal Threading.

NPTF - Dry seal



Pitch TPI	Ordering Code				
	L=12mm	L=14mm	L=21mm	L=30mm	L=40mm
18	*12-18NPTF	14-18NPTF			
14		14-14NPTF	21-14NPTF		
11.5			21-11.5NPTF	30-11.5NPTF	40-11.5NPTF
8				30-8NPTF	40-8NPTF

* Insert with one cutting edge.

Conical Pipe Thread Inserts are one sided and may be used for both External and Internal Threading.

Product Identification

Thread Milling Toolholder - Ordering Code

1	2	3	4	5
EM	018	30	21	1

1	2	3
	Cutting Diameters	Max. Cutting Depth (mm)
EM = End Mill SM = Shell Mill	018 - 18 mm	NR = No restriction on Shell Mill

4	5
Insert Size	No. of Inserts
12, 14, 21, 30, 40	1, 2, 4, 5

Technical drawing of a mechanical part, likely a shaft or rod, showing dimensions d , D , C , and L . The drawing includes a cross-section view on the left and a side view on the right. The cross-section view shows a cylindrical part with a diameter of d and a length of C . The side view shows a cylindrical part with a diameter of D and a total length of L . The part has a stepped profile with a smaller diameter section of length C and a larger diameter section of length L . The cross-section view also shows a threaded section with a nut and a bolt.

[illegible]

[illegible]

Technical drawing of a mechanical part, likely a bearing housing or a similar component. The drawing shows a cross-section with the following dimensions:

- D : Overall diameter of the main body.
- D_1 : Diameter of the central bore.
- L : Total length of the component.

The drawing includes details of a shaft with a keyway on the left and a ball bearing on the right, indicating its function in a rotating assembly.

[illegible]

Product Identification

Solid Carbide Thread Mill - Ordering Code

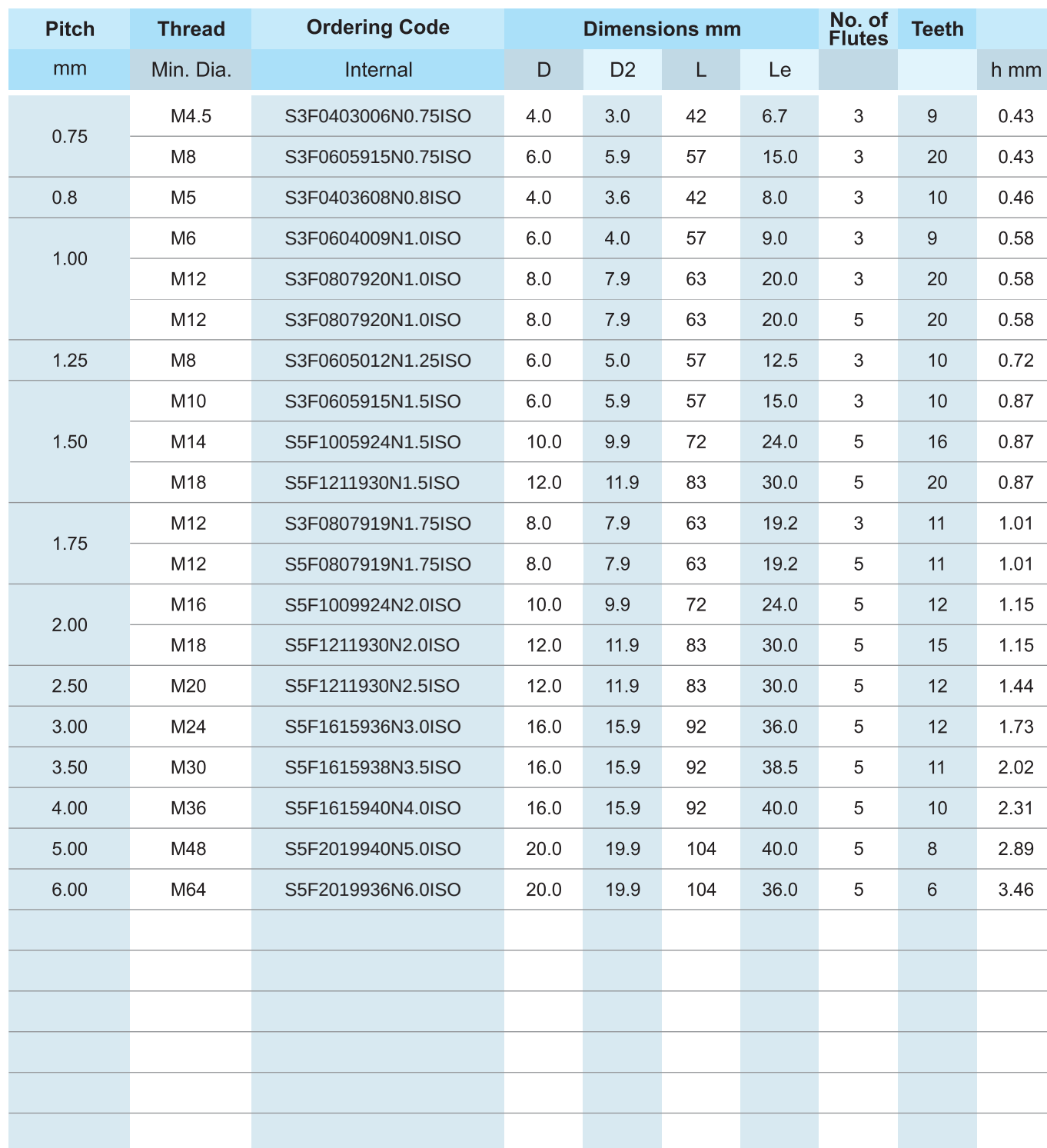
1	2	3	4	5	6	7	8
S	3F	04	036	06	N	0.75	ISO

1	Flute Style	2	CB Chip Breaker	3	Shank Diameter
S = Straight Flute H = Helical Flute		3F = 3 Flutes 5F = 5 Flutes		04 - 4.0 mm 06 - 6.0 mm 10 - 10.0 mm	

4	Cutting Diameter	5	Approx. Cutting Length	6	Type of Tool
036 - 3.6 mm 040 - 4.0 mm 099 - 9.9 mm		06 - 6 mm 08 - 8 mm 24 - 24 mm		E = External N = Internal EN = External + Internal	

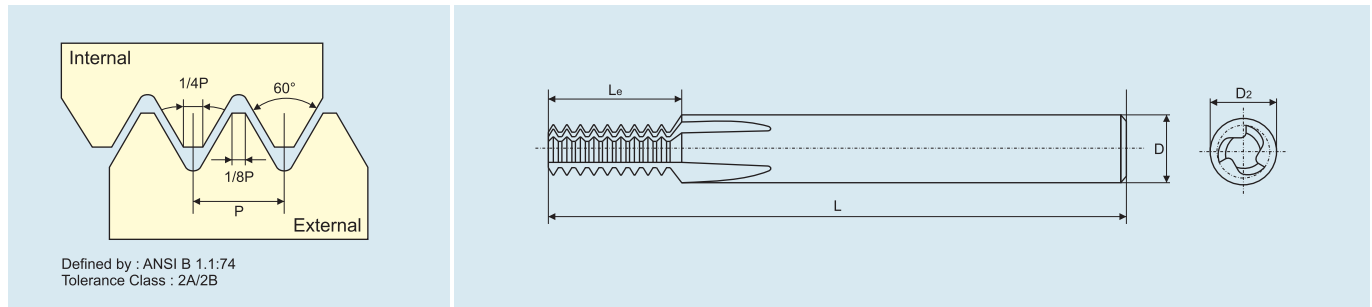
7	Pitch	8	Thread Standard																
Full Profile <table border="0"> <tr> <td>mm</td> <td>TPI</td> </tr> <tr> <td>0.05~6</td> <td>32~45</td> </tr> </table>		mm	TPI	0.05~6	32~45	<table border="0"> <tr> <td>ISO</td> <td>60° ISO Metric</td> </tr> <tr> <td>UN</td> <td>60° American UN</td> </tr> <tr> <td>W</td> <td>55° Whitworth for BSW, BSP</td> </tr> <tr> <td>BSPT</td> <td>55° British Standard Pipe Thread</td> </tr> <tr> <td>NPTF</td> <td>60° NPTF</td> </tr> <tr> <td>Pg</td> <td>DIN 40430</td> </tr> </table>		ISO	60° ISO Metric	UN	60° American UN	W	55° Whitworth for BSW, BSP	BSPT	55° British Standard Pipe Thread	NPTF	60° NPTF	Pg	DIN 40430
mm	TPI																		
0.05~6	32~45																		
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BSPT	55° British Standard Pipe Thread																		
NPTF	60° NPTF																		
Pg	DIN 40430																		

Internal, Standard-Straight Flutes



UN-60° American UN Full Profile

Internal, Standard-Straight Flutes



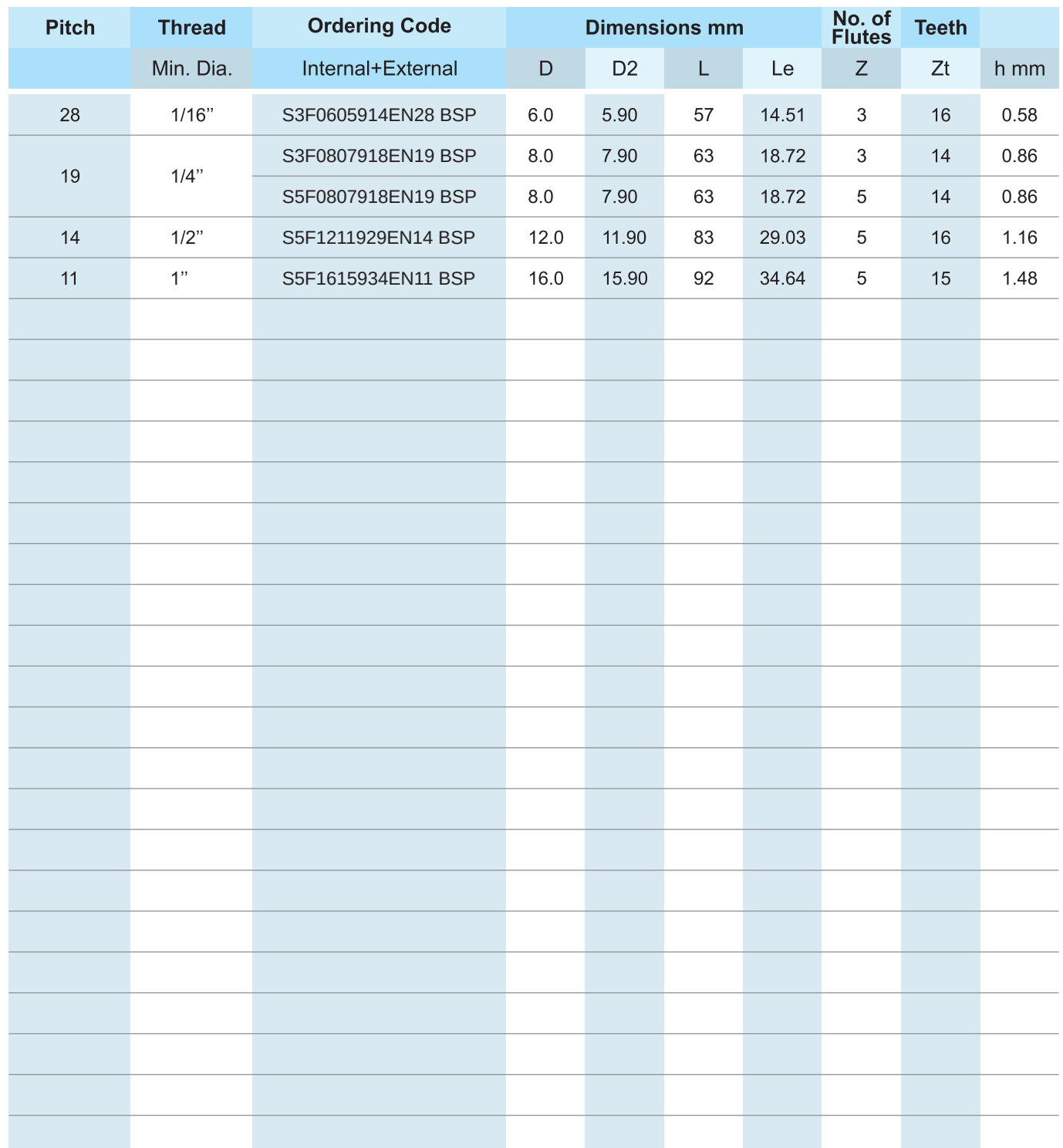
Pitch	Thread	Ordering Code	Dimensions mm				No. of Flutes	Teeth	
Coarse-UNC	Min. Dia.	Internal	D	D2	L	Le			h mm
36	No.8	S3F0403006N36UN	4.0	3.0	42	6.3	3	9	0.41
32	No.8	S3F0403006N32UN	4.0	3.0	42	6.3	3	8	0.46
	5/16"	S3F0605914N32UN	6.0	5.9	57	14.3	3	18	0.46
28	No.12	S3F0403608N28UN	4.0	3.6	42	8.2	3	9	0.52
	7/16"	S3F0807919N28UN	8.0	7.9	63	19.9	3	22	0.52
	7/16"	S5F0807919N28UN	8.0	7.9	63	19.9	5	22	0.52
24	No.12	S3F0604008N24UN	6.0	4.0	57	8.5	3	8	0.61
20	1/4"	S3F0604010N20UN	6.0	4.0	57	10.2	3	8	0.73
	9/16"	S5F1009922N20UN	10.0	9.9	72	22.9	5	18	0.73
18	5/16"	S3F0605912N18UN	6.0	5.0	57	12.7	3	9	0.81
	9/16"	S5F1009924N18UN	10.0	9.9	72	24.0	5	17	0.81
16	3/8"	S3F0605914N16UN	6.0	5.9	57	14.3	3	9	0.92
	13/16"	S5F1211928N16UN	12.0	11.9	83	28.6	5	18	0.92
14	7/16"	S3F0807918N14UN	8.0	7.9	63	18.1	3	10	1.05
	7/16"	S5F0807918N14UN	8.0	7.9	63	18.1	5	10	1.05
13	1/2"	S3F0807919N13UN	8.0	7.9	63	19.5	3	10	1.13
	1/2"	S5F0807919N13UN	8.0	7.9	63	19.5	5	10	1.13
12	9/16"	S5F1009923N12UN	10.0	9.9	72	23.3	5	11	1.22
	1"	S5F1211929N12UN	12.0	11.9	83	29.6	5	14	1.22
11	5/8"	S5F1009923N11UN	10.0	9.9	72	23.1	5	10	1.33
10	3/4"	S5F1211927N10UN	12.0	11.9	83	27.9	5	11	1.47
9	7/8"	S5F1615933N9UN	16.0	15.9	92	33.3	5	12	1.63
8	1"	S5F1615938N8UN	16.0	15.9	92	38.1	5	12	1.83
7	1 1/8"	S5F1615936N7UN	16.0	15.9	92	36.3	5	10	2.09
6	1 3/8"	S5F2019938N6UN	20.0	19.9	104	38.1	5	9	2.44
5	1 3/4"	S5F2019940N5UN	20.0	19.9	104	40.6	5	8	2.93
4.5	2"	S5F2019939N4.5UN	20.0	19.9	104	39.5	5	7	3.26

Technical drawing of a double-flute drill bit. The left part shows a cross-section with a double-flute design. The internal flutes are labeled "Internal" and the external flutes are labeled "External". The radius of the flutes is indicated as $R0.137P$. The angle between the flutes is 55° . The pitch of the flutes is labeled P . The right part shows a side view of the drill bit with dimensions L_e (length of the cutting edge), L (total length), and D (diameter). A detail view of the end of the drill bit is shown on the far right, indicating the diameter D_2 .

Defined by : B.S.84:1956, DIN 259, ISO 228/1:1982
Tolerance Class : Medium Class A

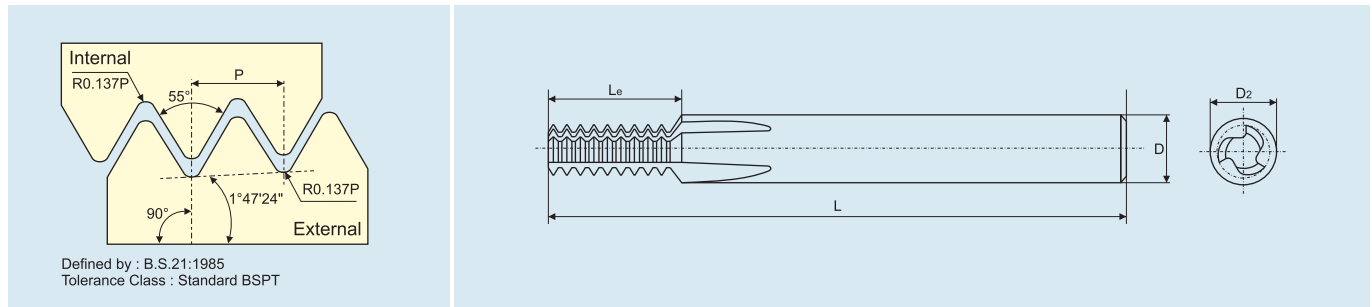
[illegible]

Standard-Straight Flutes



BSPT-55° British Standard Pipe Full Profile

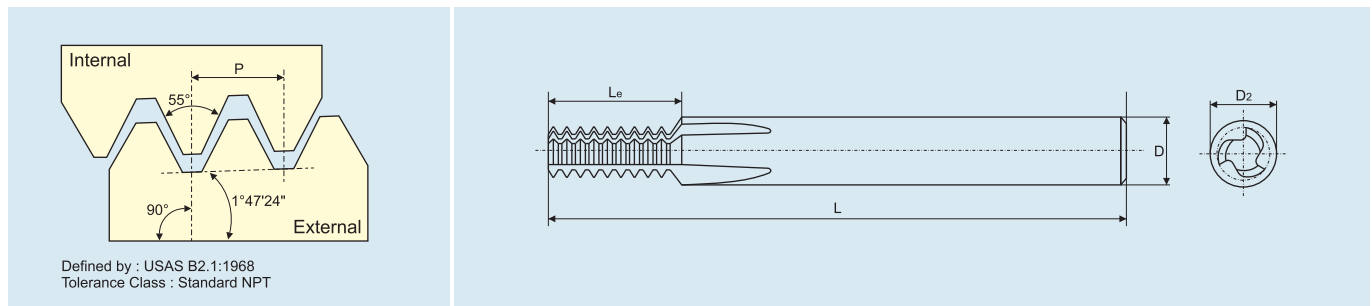
Standard-Straight Flutes



Pitch	Thread	Ordering Code	Dimensions mm				No. of Flutes	Teeth	
	Min. Dia.	Internal+External	D	D2	L	Le			h mm
28	1/16"	S3F0605909EN28BSPT	6.0	5.90	57	9.98	3	11	0.58
19	1/4"	S3F0807914EN19BSPT	8.0	7.90	63	14.71	3	11	0.86
		S5F0807914EN19BSPT	8.0	7.90	63	14.71	5	11	0.86
14	1/2"	S5F1211919EN14BSPT	12.0	11.90	83	19.96	5	11	1.16
11	1"	S5F1615939EN11BSPT	16.0	15.90	92	39.25	5	17	1.48

NPT-60° National Pipe Threads

External & Internal



Pitch	Thread	Ordering Code	Dimensions mm				No. of Flutes	Teeth	
	Min. Dia.	Internal+External	D	D2	L	Le			h mm
27	1/16	S3F0605909EN27NPT	6.0	5.9	57	9.41	3	10	0.66
18	1/4	S3F0807914EN18NPT	8.0	7.9	63	14.11	3	10	1.01
		S5F0807914EN18NPT	8.0	7.9	63	14.11	5	10	1.01
14	1/2	S5F1211919EN14NPT	12.0	11.9	83	19.96	5	11	1.33
11.5	1	S5F1615926EN11.5NPT	16.0	15.9	92	26.51	5	12	1.64
8	2 1/2	S5F1615938EN8NPT	16.0	15.9	92	38.10	5	12	2.42

Internal

External

60°

90°

1°47'24"

P

Defined by : ANSI B1.20.3-1976
Tolerance Class : Standard NPTF

Technical drawing of a 1/2" NPTF plug valve. The left side shows a cross-section of the internal thread profile with dimensions: 60° for the thread angle, 90° for the thread form, 1°47'24" for the thread angle, and P for the pitch. The right side shows the valve assembly with dimensions: L_a for the actuator length, L for the valve body length, D for the valve body diameter, and D₂ for the actuator diameter.

[illegible]

Technical drawing of a double-fluted reamer. The left part shows a cross-section of the flutes, labeled 'Internal' and 'External', with a 80° angle and R0.107P fillet. The right part shows a side view with dimensions: L_0 (flute length), L (total length), D (outer diameter), and D_2 (inner diameter).

[illegible]

Technical Section

Example of Thread Milling CNC Program for Internal Threading

Right hand thread (climb milling) from bottom up.

Program is based on tool center.

This method of programming needs no tool radius compensation value other than an offset for wear.

$$A = \frac{D_o - D}{2}$$

A = Radius of tool path
D_o = Major thread dia.
D = Cutting dia.

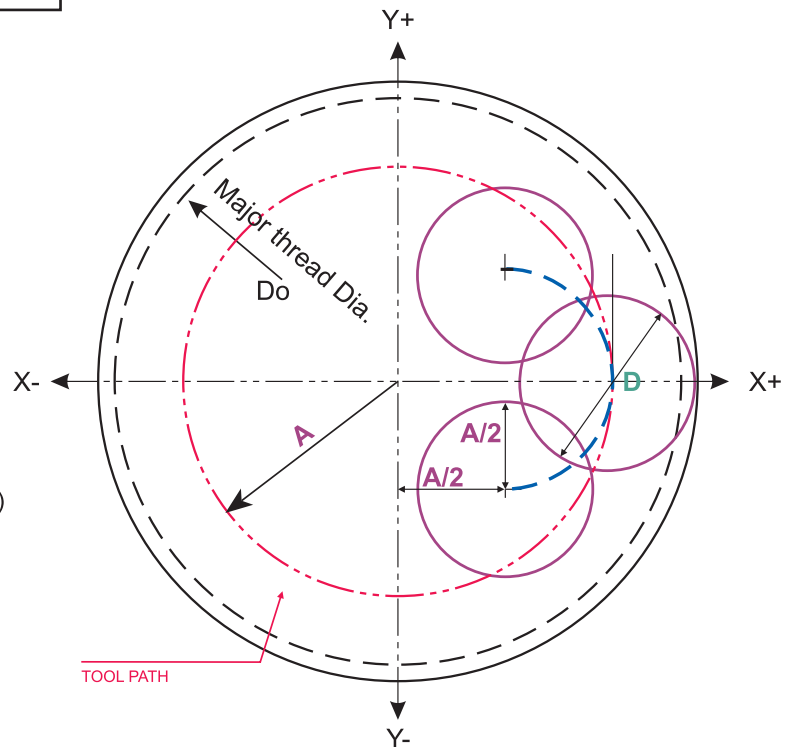
General Program

```
G90 G00 G54 G43 H1X0 Y0 Z10 S---
G00 Z - (TO THREAD DEPTH )
G01 G91 G41 D1 X(A/2) Y-(A/2) Z0 F---
G03 X(A/2)Y(A/2) R(A/2) Z(1/8 PITCH)
G03 X0 Y0 I-(A) J0 Z(PITCH)
G03 X-(A/2) Y(A/2) R(A/2) Z(1/8 PITCH)
G01 G40 X-(A/2) Y-(A/2) Z0
G90 X0 Y0 Z0
```

Internal Thread

EXAMPLE : M 32 X 2.0 (Thread depth 18mm)
TOOLHOLDER : EM02140-21-1 (Cutting dia. 21 mm)
INSERT : 21 N 2.0 ISO
A=(32-21)/2 = 5.5

```
G90 G00 G54 G43 H1X0 Y0 Z10 S2800
G00 Z-18
G01 G91 G41X2.75Y-2.75 Z0 F85 D1
G03 X2.75 Y2.75 R2.75 Z0.25
G03 X0 Y0 I-5.5 J0 Z2
G03 X-2.75 Y2.75 R2.75 Z0.25
G01 G40 X-2.75 Y-2.75 Z0
G90 G0 X0 Y0 Z0
```



Technical Section

Mill-Thread Inserts & Solid Carbide Straight Flute Speed and Feed selection

CG230	PVD TiAlN coated micro grain general purpose grade. Suitable for all materials at medium to high cutting speed.
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Material	Cutting Speed
Low and Medium Carbon Steels	110 - 250
High Carbon Steels	100 - 180
Alloy Steels, Treated Steels	90 - 160
Stainless Steels	70 - 150
Cast Steels	130 - 180
Cast Iron	80 - 150
Non-ferrous, Aluminium Alloys	150 - 300
Nickel Alloys, Titanium Alloys	20 - 80
Synthetics, Duroplastics	120 - 400

Recommended Feed Rate

Indexable Inserts	0.05 - 0.15 mm
Solid Carbide Straight Flute	0.02 - 0.10 mm