

Drill sizes for tapping

To supplement the information on drill sizes for tapping discussed at Eddie’s talk, members might find the following tables useful. Although many people manage with a single given tapping drill for each thread size, it is good practice to select a tapping drill that gives an appropriate percentage thread engagement for the material in question. Table 1 gives the ideal percentage thread engagement for different materials and Table 2 offers a range of tapping drills for different percentages of BSF thread engagement.

Table 1 – Recommended thread engagement percentages for tapping different materials

Material	Percentage Engagement
Copper	65 to 70
Aluminium Alloys	Around 70
Gunmetal	Around 75
Rolled Brass	70 to 80
Cast Brass	80 to 85
Mild Steel	75 to 80
Cast Iron	Around 85

Table 2 – BSF Tapping and clearance data. Please note that quoted drill sizes are a mix of imperial, metric and number. Equivalent sizes can be found in numerous sources including the well-known Zeus Tables

BSF Thread			Clearance		Tapping	
Overall Diameter (In)	TPI – Threads per inch	Thread Depth (in)	Clearing Drill	Clearance on diameter (Thou)	Tapping Drill Dia	% Engagement (E)
3/16 0.1875	32	0.0200	No 12	1.5	No 23	84
			No 11	3.5	5/32	78
					No 21	70
					No 20	66

7/32 0.2188	28	0.0228	5.6 mm	1.7	No 15	85
			No 2	2.2	No 14	80
			5.7 mm	5.6	No 13	74
					No 12	65
1/4 0.2500	26	0.0246	6.4 mm	2	No 4	83
			6.5	6	No 3	75
			F	7	5.4 mm	70
					No 2	59
9/32 0.2812	26	0.0246	7.2 mm	2.3	C	80
			L	8.8	6.2 mm	75
					6.3	67
					1/4	63
5/16 0.3125	22	0.0291	8 mm	2.5	G	88
			O	3.5	17/64	80
					6.9	70
					7 mm	63
3/8 0.3750	20	0.0320	V	2.0	O	92
			9.7 mm	6.9	P	81
					8.3 mm	75
					8.4 mm	69
7/16 0.4375	18	0.0356	11.2	3.4	3/8	88
			11.3	7.4	V	85
					9.7 mm	78
					9.8 mm	73
1/2 0.500	16	0.0400	12.75	2	11 mm	84
			12.8	3.9	7/16	78
			12.9	7.9	11.2	74
					11.4	64

Notes:

1 – Thread depth (d) = 0.64/TPI

2 – Core diameter = OD – (1.28 x Pitch)

3 – Pitch = $1/\text{TPI}$
($2 \times d \times E/100$)

4 – For a given % engagement (E), the tapping drill size = Screw Dia (D) –

I can include similar tables for Whitworth, BA and other thread forms in the next Newsletter if readers find these data of interest Ed