ACE Hardware Zimbabwe

Tap Drill & Clearance Drill Chart

Tapping drills and clearance holes for metric, unified, British and pipe threads.

Workshop Reference Charts
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Metric threads

Metric coarse (ISO 261) - tap drill and ISO 273 clearance holes, mm

Thread	Pitch	Tap drill	Form tap*	Close	Medium	Free
M1.6	0.35	1.25	1.43	1.7	1.8	2
M2	0.4	1.6	1.8	2.2	2.4	2.6
M2.5	0.45	2.05	2.27	2.7	2.9	3.1
M3	0.5	2.5	2.75	3.2	3.4	3.6
M4	0.7	3.3	3.65	4.3	4.5	4.8
M5	0.8	4.2	4.6	5.3	5.5	5.8
M6	1	5	5.5	6.4	6.6	7
M8	1.25	6.75	7.38	8.4	9	10
M10	1.5	8.5	9.25	10.5	11	12
M12	1.75	10.25	11.12	13	13.5	14.5
M14	2	12	13	15	15.5	16.5
M16	2	14	15	17	17.5	18.5
M18	2.5	15.5	16.75	19	20	21
M20	2.5	17.5	18.75	21	22	24
M22	2.5	19.5	20.75	23	24	26
M24	3	21	22.5	25	26	28
M27	3	24	25.5	28	30	32
M30	3.5	26.5	28.25	31	33	35
M33	3.5	29.5	31.25	34	36	38
M36	4	32	34	37	39	42

Metric fine - tap drill, mm

Thread	Tap drill	Form tap*
M8 × 1	7	7.5
M10 × 1.25	8.75	9.38
M10 × 1	9	9.5
M12 × 1.5	10.5	11.25
M12 × 1.25	10.75	11.38
M14 × 1.5	12.5	13.25
M16 × 1.5	14.5	15.25
M18 × 1.5	16.5	17.25
M20 × 1.5	18.5	19.25
M22 × 1.5	20.5	21.25
M24 × 2	22	23
M27 × 2	25	26
M30 × 2	28	29

Rule of thumb: metric tap drill = nominal diameter − pitch (M10 × 1.5 → 8.5 mm).

* **Form (roll) taps** displace metal instead of cutting it and need a larger hole, roughly nominal − ½ pitch. Use the tap maker's figure where given.

Clearance holes (ISO 273): close for accurate location, medium for general work, free where holes may not line up exactly.

Unified (inch) threads

Unified coarse (UNC)

UNC	Tap drill (~75% thread)	Clearance - close	Clearance - free
#4-40	#43 (0.0890" / 2.26 mm)	#32 (0.1160" / 2.95 mm)	#30 (0.1285" / 3.26 mm)
#6-32	#36 (0.1065" / 2.71 mm)	#27 (0.1440" / 3.66 mm)	#25 (0.1495" / 3.80 mm)
#8-32	#29 (0.1360" / 3.45 mm)	#18 (0.1695" / 4.31 mm)	#16 (0.1770" / 4.50 mm)
#10-24	#25 (0.1495" / 3.80 mm)	#9 (0.1960" / 4.98 mm)	#7 (0.2010" / 5.11 mm)
#12-24	#16 (0.1770" / 4.50 mm)	#2 (0.2210" / 5.61 mm)	#1 (0.2280" / 5.79 mm)
1/4"-20	#7 (0.2010" / 5.11 mm)	F (0.2570" / 6.53 mm)	H (0.2660" / 6.76 mm)
5/16"-18	F (0.2570" / 6.53 mm)	P (0.3230" / 8.20 mm)	Q (0.3320" / 8.43 mm)
3/8"-16	5/16" (0.3125" / 7.94 mm)	W (0.3860" / 9.80 mm)	X (0.3970" / 10.08 mm)
7/16"-14	U (0.3680" / 9.35 mm)	29/64" (0.4531" / 11.51 mm)	15/32" (0.4688" / 11.91 mm)
1/2"-13	27/64" (0.4219" / 10.72 mm)	33/64" (0.5156" / 13.10 mm)	17/32" (0.5312" / 13.49 mm)
9/16"-12	31/64" (0.4844" / 12.30 mm)	37/64" (0.5781" / 14.68 mm)	19/32" (0.5938" / 15.08 mm)
5/8"-11	17/32" (0.5312" / 13.49 mm)	41/64" (0.6406" / 16.27 mm)	21/32" (0.6562" / 16.67 mm)
3/4"-10	21/32" (0.6562" / 16.67 mm)	49/64" (0.7656" / 19.45 mm)	25/32" (0.7812" / 19.84 mm)
7/8"-9	49/64" (0.7656" / 19.45 mm)	57/64" (0.8906" / 22.62 mm)	29/32" (0.9062" / 23.02 mm)
1"-8	7/8" (0.8750" / 22.22 mm)	1-1/64" (1.0156" / 25.80 mm)	1-1/32" (1.0312" / 26.19 mm)

Unified fine (UNF) - clearance as UNC

UNF	Tap drill (~75% thread)
#4-48	#42 (0.0935" / 2.37 mm)
#6-40	#33 (0.1130" / 2.87 mm)
#8-36	#29 (0.1360" / 3.45 mm)
#10-32	#21 (0.1590" / 4.04 mm)
#12-28	#14 (0.1820" / 4.62 mm)
1/4"-28	#3 (0.2130" / 5.41 mm)
5/16"-24	I (0.2720" / 6.91 mm)
3/8"-24	Q (0.3320" / 8.43 mm)
7/16"-20	25/64" (0.3906" / 9.92 mm)
1/2"-20	29/64" (0.4531" / 11.51 mm)
9/16"-18	33/64" (0.5156" / 13.10 mm)
5/8"-18	37/64" (0.5781" / 14.68 mm)
3/4"-16	11/16" (0.6875" / 17.46 mm)
7/8"-14	13/16" (0.8125" / 20.64 mm)
1"-12	59/64" (0.9219" / 23.42 mm)

British and pipe threads

British Standard Whitworth

BSW (TPI)	Tap drill mm
1/8" - 40	2.55
3/16" - 24	3.7
1/4" - 20	5.1
5/16" - 18	6.5
3/8" - 16	7.9
7/16" - 14	9.3
1/2" - 12	10.5
5/8" - 11	13.5
3/4" - 10	16.25
7/8" - 9	19.25
1" - 8	22

British Standard Fine

BSF (TPI)	Tap drill mm
1/4" - 26	5.3
5/16" - 22	6.8
3/8" - 20	8.3
7/16" - 18	9.7
1/2" - 16	11.1
9/16" - 16	12.7
5/8" - 14	14
3/4" - 12	16.75
7/8" - 11	19.75
1" - 10	22.75

BSP parallel (G, ISO 228)

BSP parallel	TPI	Thread OD mm	Tap drill mm
G 1/8"	28	9.728	8.8
G 1/4"	19	13.157	11.8
G 3/8"	19	16.662	15.25
G 1/2"	14	20.955	19
G 3/4"	14	26.441	24.5
G 1"	11	33.249	30.75
G 1-1/4"	11	41.91	39.5
G 1-1/2"	11	47.803	45.25
G 2"	11	59.614	57

NPT taper pipe

NPT	TPI	Tap drill (no reamer)
1/8" NPT	27	R (0.3390" / 8.61 mm)
1/4" NPT	18	7/16" (0.4375" / 11.11 mm)
3/8" NPT	18	37/64" (0.5781" / 14.68 mm)
1/2" NPT	14	23/32" (0.7188" / 18.26 mm)
3/4" NPT	14	59/64" (0.9219" / 23.42 mm)
1" NPT	11.5	1-5/32" (1.1562" / 29.37 mm)
1-1/4" NPT	11.5	1-1/2" (1.5000" / 38.10 mm)
1-1/2" NPT	11.5	1-23/32" (1.7188" / 43.66 mm)
2" NPT	11.5	2-3/16" (2.1875" / 55.56 mm)

BSPT (taper, R/Rc) uses the same sizes and TPI as BSP and is normally tapped with the BSP drill size, or one size smaller if a taper reamer isn't used. Pipe thread sizes refer to the nominal pipe bore, not the thread diameter.

Guide values for general workshop use. Always follow the equipment or fastener maker's figure where one is given, and check critical work against the relevant standard.

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