Recommended Core Drill Diameters for Thread Cutting Taps

Metric Thread **Metric ISO Thread** from M 1 up to M 56

Nut thread				Drill dia.
Designation	Minor dia.			
	Tol. class	Limits		
		max.	min.	
M 1	5 H	0,785	0,729	0,75
M 1,1	5 H	0,885	0,829	0,85
M 1,2	5 H	0,985	0,929	0,95
M 1,4	6 H	1,142	1,075	1,10
M 1,6	6 H	1,321	1,221	1,25
M 1,8	6 H	1,521	1,421	1,45
M 2	6 H	1,679	1,567	1,60
M 2,2	6 H	1,838	1,713	1,75
M 2,5	6 H	2,138	2,013	2,05
M 3	6 H	2,599	2,459	2,50
M 3,5	6 H	3,010	2,850	2,90
M 4	6 H	3,422	3,242	3,30
M 4,5	6 H	3,878	3,688	3,70

Nut thread				Drill dia.
Designation	Minor dia.			
	Tol. class	Limits		
		max.	min.	
M 5	6 H	4,334	4,134	4,20
M 6	6 H	5,153	4,917	5,00
M 7	6 H	6,153	5,917	6,00
M 8	6 H	6,912	6,647	6,80
M 9	6 H	7,912	7,647	7,80
M 10	6 H	8,676	8,376	8,50
M 11	6 H	9,676	9,376	9,50
M 12	6 H	10,441	10,106	10,20
M 14	6 H	12,210	11,835	12,00
M 16	6 H	14,210	13,835	14,00
M 18	6 H	15,744	15,294	15,50
M 20	6 H	17,744	17,294	17,50
M 22	6 H	19,744	19,294	19,50

Nut thread				Drill dia.
Designation	Minor dia.			
	Tol. class	Limits		
		max.	min.	
M 24	6 H	21,252	20,752	21,00
M 27	6 H	24,252	23,752	24,00
M 30	6 H	26,771	26,211	26,50
M 33	6 H	29,771	29,211	29,50
M 36	6 H	32,270	31,670	32,00
M 39	6 H	35,270	34,670	35,00
M 42	6 H	37,799	37,129	37,50
M 45	6 H	40,799	40,129	40,50
M 48	6 H	43,297	42,587	43,00
M 52	6 H	47,297	46,587	47,00
M 56	6 H	50,796	50,046	50,50

Metric Fine Thread from M 1× 0,2 up to M 48 × 4

Nut thread				Drill dia.
Designation	Minor dia.			
	Tol. class	Limits		
		max.	min.	
M 1 × 0,2	4 H	0,821	0,783	0,80
M 1,1 × 0,2	4 H	0,921	0,883	0,90
M 1,2 × 0,2	4 H	1,021	0,983	1,00
M 1,4 × 0,2	4 H	1,221	1,183	1,20
M 1,4 × 0,25	5 H	1,185	1,129	1,15
M 1,6 × 0,2	4 H	1,421	1,383	1,40
M 1,8 × 0,2	4 H	1,621	1,583	1,60
M 2 × 0,25	5 H	1,785	1,729	1,75
M 2,2 × 0,25	5 H	1,985	1,929	1,95
M 2,5 × 0,35	6 H	2,221	2,121	2,15
M 3 × 0,35	6 H	2,721	2,621	2,65
M 3,5 × 0,35	6 H	3,221	3,112	3,15
M 4 × 0,5	6 H	3,599	3,459	3,50
M 4,5 × 0,5	6 H	4,099	3,959	4,00
M 5 × 0,5	6 H	4,599	4,459	4,50
M 5,5 × 0,5	6 H	5,099	4,959	5,00
M 6 × 0,75	6 H	5,378	5,188	5,20
M 7 × 0,75	6 H	6,378	6,188	6,20
M 8 × 0,75	6 H	7,378	7,188	7,20
M 8 × 1	6 H	7,153	6,917	7,00
M 9 × 0,75	6 H	8,378	8,188	8,20
M 9 × 1	6 H	8,153	7,917	8,00
M 10 × 0,75	6 H	9,378	9,188	9,20
M 10 × 1	6 H	9,153	8,917	9,00
M 10 × 1,25	6 H	8,912	8,647	8,80
M 11 × 0,75	6 H	10,378	10,188	10,20
M 11 × 1	6 H	10,153	9,917	10,00
M 12 × 1	6 H	11,153	10,917	11,00
M 12 × 1,25	6 H	10,912	10,647	10,80
M 12 × 1,5	6 H	10,676	10,376	10,50
M 14 × 1	6 H	13,153	12,917	13,00

Nut thread				Drill dia.
Designation	Minor dia.			
	Tol. class	Limits		
		max.	min.	
M 14 × 1,25	6 H	12,912	12,647	12,80
M 14 × 1,5	6 H	12,676	12,376	12,50
M 15 × 1	6 H	14,153	13,917	14,00
M 15 × 1,5	6 H	13,676	13,376	13,50
M 16 × 1	6 H	15,153	14,917	15,00
M 16 × 1,5	6 H	14,676	14,376	14,50
M 17 × 1	6 H	16,153	15,917	16,00
M 17 × 1,5	6 H	15,676	15,376	15,50
M 18 × 1	6 H	17,153	16,917	17,00
M 18 × 1,5	6 H	16,676	16,376	16,50
M 18 × 2	6 H	16,210	15,835	16,00
M 20 × 1	6 H	19,153	18,917	19,00
M 20 × 1,5	6 H	18,676	18,376	18,50
M 20 × 2	6 H	18,210	17,835	18,00
M 22 × 1	6 H	21,153	20,917	21,00
M 22 × 1,5	6 H	20,676	20,376	20,50
M 22 × 2	6 H	20,210	19,835	20,00
M 24 × 1	6 H	23,153	22,917	23,00
M 24 × 1,5	6 H	22,676	22,376	22,50
M 24 × 2	6 H	22,210	21,835	22,00
M 25 × 1	6 H	24,153	23,917	24,00
M 25 × 1,5	6 H	23,676	23,376	23,50
M 25 × 2	6 H	23,210	22,835	23,00
M 26 × 1,5	6 H	24,676	24,376	24,50
M 27 × 1	6 H	26,153	25,917	26,00
M 27 × 1,5	6 H	25,676	25,376	25,50
M 27 × 2	6 H	25,210	24,835	25,00
M 28 × 1	6 H	27,153	26,917	27,00
M 28 × 1,5	6 H	26,676	26,376	26,50
M 28 × 2	6 H	26,210	25,835	26,00
M 30 × 1	6 H	29,153	28,917	29,00

Nut thread				Drill dia.
Designation	Minor dia.			
	Tol. class	Limits		
		max.	min.	
M 30 × 1,5	6 H	28,676	28,376	28,50
M 30 × 2	6 H	28,210	27,835	28,00
M 30 × 3	6 H	27,252	26,752	27,00
M 32 × 1,5	6 H	30,676	30,376	30,50
M 32 × 2	6 H	30,210	29,835	30,00
M 33 × 1,5	6 H	31,676	31,376	31,50
M 33 × 2	6 H	31,210	30,835	31,00
M 33 × 3	6 H	30,252	29,752	30,00
M 35 × 1,5	6 H	33,676	33,376	33,50
M 36 × 1,5	6 H	34,676	34,376	34,50
M 36 × 2	6 H	34,210	33,835	34,00
M 36 × 3	6 H	33,252	32,752	33,00
M 38 × 1,5	6 H	36,676	36,376	36,50
M 39 × 1,5	6 H	37,676	37,376	37,50
M 39 × 2	6 H	37,210	36,835	37,00
M 39 × 3	6 H	36,252	35,752	36,00
M 40 × 1,5	6 H	38,676	38,376	38,50
M 40 × 2	6 H	38,210	37,835	38,00
M 40 × 3	6 H	37,252	36,752	37,00
M 42 × 1,5	6 H	40,676	40,376	40,50
M 42 × 2	6 H	40,210	39,835	40,00
M 42 × 3	6 H	39,252	38,752	39,00
M 42 × 4	6 H	38,270	37,670	38,00
M 45 × 1,5	6 H	43,676	43,376	43,50
M 45 × 2	6 H	43,210	42,835	43,00
M 45 × 3	6 H	42,252	41,752	42,00
M 45 × 4	6 H	41,270	40,670	41,00
M 48 × 1,5	6 H	46,676	46,376	46,50
M 48 × 2	6 H	46,210	45,835	46,00
M 48 × 3	6 H	45,252	44,752	45,00
M 48 × 4	6 H	44,270	43,670	44,00

Metric Fine Thread

Pitch	Drill and core Drill dia. = Nominal dia. minus following value	Pitch	Drill and core Drill dia. = Nominal dia. minus following value
0,2	0,20	1	1,00
0,25	0,25	1,5	1,50
0,35	0,35	2	2,00
0,5	0,50	3	3,00
0,75	0,80	4	4,00

Metric Thread M 1,7, M 2,3, M 2,6
acc. to DIN 13, p. 1 (Feb. 1949)

Nut thread			Drill dia.
Designation	Minor dia. Limits		
	max.	min.	
M 1,7	1,346	1,256	1,30
M 2,3	1,920	1,795	1,90
M 2,6	2,176	2,036	2,10

Recommended Core Drill Diameters for Thread Cutting Taps

Unified Thread

Unified Coarse Thread UNC = American National Coarse-Thread

Designation	Minor dia. mm for fit 2 B		Drill sizes mm (extract from ISO 2306-1972)
	min.	max.	
1 - 64 UNC	1,425	1,582	1,55
2 - 56 UNC	1,694	1,872	1,85
3 - 48 UNC	1,941	2,146	2,10
4 - 40 UNC	2,156	2,385	2,35
5 - 40 UNC	2,487	2,697	2,65
6 - 32 UNC	2,642	2,896	2,85
8 - 32 UNC	3,302	3,531	3,50
10 - 24 UNC	3,683	3,962	3,90
12 - 24 UNC	4,343	4,597	4,50
1/4 - 20 UNC	4,976	5,268	5,10
5/16 - 18 UNC	6,411	6,734	6,60
3/8 - 16 UNC	7,805	8,164	8,00
7/16 - 14 UNC	9,149	9,550	9,40
1/2 - 13 UNC	10,584	11,013	10,80
9/16 - 12 UNC	11,996	12,456	12,20
5/8 - 11 UNC	13,376	13,868	13,50
3/4 - 10 UNC	16,299	16,833	16,50
7/8 - 9 UNC	19,169	19,748	19,50
1 - 8 UNC	21,963	22,598	22,25
1 1/8 - 7 UNC	24,648	25,349	25,00
1 1/4 - 7 UNC	27,823	28,524	28,00
1 3/8 - 6 UNC	30,343	31,120	30,75
1 1/2 - 6 UNC	33,518	34,295	34,00
1 3/4 - 5 UNC	38,951	39,814	39,50
2 - 4 1/2 UNC	44,689	45,598	45,00

Unified Fine Thread UNF = American National Fine-Thread

Designation	Minor dia. mm for fit 2 B		Drill sizes mm (extract from ISO 2306-1972)
	min.	max.	
1 -72 UNF	1,473	1,613	1,55
2 -64 UNF	1,755	1,913	1,90
3 -56 UNF	2,024	2,197	2,15
4 -48 UNF	2,271	2,459	2,40
5 -44 UNF	2,550	2,741	2,70
6 -40 UNF	2,819	3,023	2,95
8 -36 UNF	3,404	3,607	3,50
10 -32 UNF	3,962	4,166	4,10
12 -28 UNF	4,496	4,724	4,70
1/4 -28 UNF	5,367	5,580	5,50
5/16 -24 UNF	6,792	7,038	6,90
3/8 -24 UNF	8,379	8,626	8,50
7/16 -20 UNF	9,738	10,030	9,90
1/2 -20 UNF	11,326	11,618	11,50
9/16 -18 UNF	12,761	13,084	12,90
5/8 -18 UNF	14,348	14,671	14,50
3/4 -16 UNF	17,330	17,689	17,50
7/8 -14 UNF	20,262	20,663	20,40
1 -12 UNF	23,109	23,569	23,25
1 1/8 -12 UNF	26,284	26,744	26,50
1 1/4 -12 UNF	29,459	29,919	29,50
1 3/8 -12 UNF	32,634	33,094	32,75
1 1/2 -12 UNF	35,809	36,269	36,00

UNJC to ISO 3161

Designation	Diameter
No. 1-64	1,5
No. 2-56	1,8
No. 3-48	2,05
No. 4-40	2,3
No. 5-40	2,65
No. 6-32	2,8
No. 8-32	3,5
No. 10-24	3,9
No. 12-24	4,6
1/4-20	5,2
5/16-18	6,7
3/8-16	8,1
7/16-14	9,5
1/2-13	10,9
9/16-12	12,3
5/8-11	13,7
3/4-10	16,75

UNJF to ISO 3161

Designation	Diameter
No. 0-80	1,25
No. 1-72	1,55
No. 2-64	1,85
No. 3-56	2,1
No. 4-48	2,4
No. 5-44	2,7
No. 6-40	2,95
No. 8-36	3,6
No. 10-32	4,15
No. 12-28	4,7
1/4-28	5,6
5/16-24	7
3/8-24	8,6
7/16-20	10,0
1/2-20	11,5
9/16-12	12,3
5/8-18	14,5

Recommended Core Drill Diameters for Thread Cutting Taps

Whitworth-, Whitworthpipe-, Pipe-, PG- and NPT-Thread

Whitworth Thread BSW

Designation	Minor dia. mm min.	Minor dia. mm max.	Drill size mm
BSW 1/16			1,20
BSW 3/32			1,90
BSW 1/8			2,50
BSW 5/32			3,20
BSW 3/16			3,60
BSW 7/32			4,50
BSW 1/4	4,744	5,224	5,10
BSW 5/16	6,151	6,661	6,50
BSW 3/8	7,512	8,052	7,90
BSW 7/16	8,809	9,379	9,30
BSW 1/2	10,015	10,610	10,50
BSW 5/8	12,948	13,598	13,50
BSW 3/4	15,831	16,538	16,50
BSW 7/8	18,647	19,411	19,25
BSW 1	21,375	22,185	22,00
BSW 1 1/8	23,976	24,879	24,75
BSW 1 1/4	27,151	28,054	28,00
BSW 1 3/8	29,558	30,555	30,50
BSW 1 1/2	32,733	33,730	33,50
BSW 1 5/8	34,834	35,921	35,50
BSW 1 3/4	38,009	39,096	39,00
BSW 2	43,643	44,823	44,50
BSW 2 1/4	49,100	50,420	50,00
BSW 2 1/2	55,450	56,770	57,00
BSW 2 3/4	60,648	62,108	61,00
BSW 3	66,699	68,459	68,00

Steel Conduit Thread PG

DIN 40430

Designation	Minor dia. mm min.	Minor dia. mm max.	Drill size mm
Pg 7	11,30	11,45	11,40
Pg 9	13,86	14,01	14,00
Pg 11	17,26	17,41	17,25
Pg 13,5	19,06	19,21	19,00
Pg 16	21,16	21,31	21,25
Pg 21	26,78	27,03	27,00
Pg 29	35,48	35,73	35,50
Pg 36	45,48	45,73	45,50
Pg 42	52,48	52,73	52,50
Pg 48	57,78	58,03	58,00

Whitworth Pipe Thread

DIN 2999
cylindrical internal turcad/taper external thread

Designation	Minor dia. mm min.	Minor dia. mm max.	Drill size mm
Rp 1/16	6,490	6,632	6,60
Rp 1/8	8,495	8,637	8,60
Rp 1/4	11,341	11,549	11,50
Rp 3/8	14,846	15,054	15,00
Rp 1/2	18,489	18,773	18,75
Rp 3/4	23,975	24,259	24,25
Rp 1	30,111	30,471	30,25
Rp 1 1/4	38,772	39,132	39,00
Rp 1 1/2	44,665	45,025	45,00
Rp 2	56,476	56,836	56,50

Pipe Thread

DIN-ISO 228
Cylindrical internal thread/cylindrical external thread
pressure tight joint not made on thread

Designation	Minor dia. mm min.	Minor dia. mm max.	Drill size mm
G 1/16	6,561	6,843	6,80
G 1/8	8,566	8,848	8,80
G 1/4	11,445	11,890	11,80
G 3/8	14,950	15,395	15,25
G 1/2	18,631	19,172	19,00
G 5/8	20,587	21,128	21,00
G 3/4	24,117	24,658	24,50
G 7/8	27,877	28,418	28,25
G 1	30,291	30,931	30,75
G 1 1/8	34,939	35,579	35,50
G 1 1/4	38,952	39,592	39,50
G 1 1/2	44,845	45,485	45,00
G 1 3/4	50,788	51,428	51,00
G 2	56,656	57,296	57,00
G 2 1/4	62,752	63,392	63,00
G 2 1/2	72,226	72,866	73,00
G 2 3/4	78,576	79,216	79,00
G 3	84,926	85,566	85,00

NPT-Thread

Tapered pipe thread 1:16

Designation	Nominal thread size mm	Designation	Nominal thread size mm
1/8	8,50	1	29,00
1/4	11,10	1 1/4	38,00
3/8	14,50	1 1/2	44,00
1/2	17,75	2	56,00
3/4	23,00		

Recommended Core Drill Diameters for Cold Forming Taps

Tapping Drill Sizes for Forming Taps

Metric Thread

Recommendations: Forming drill dia. = Major dia. of thread – 0,5 × pitch
This formula results in the following values:

Major dia.	Pitch mm	Forming drill sizes mm
M 1	0,25	0,88
M 1,2	0,25	1,08
M 1,4	0,30	1,26
M 1,6	0,35	1,45
(M 1,7)	0,35	1,55
M 1,8	0,35	1,65
M 2	0,40	1,82
M 2,2	0,45	2,00
(M 2,3)	0,40	2,10
M 2,5	0,45	2,30
(M 2,6)	0,45	2,40
M 3	0,50	2,80

Major dia.	Pitch mm	Forming drill sizes mm
M 3,5	0,60	3,25
M 4	0,70	3,70
M 5	0,80	4,65
M 6	1,00	5,55
M 8	1,25	7,40
M 10	1,50	9,30
M 12	1,75	11,20
M 14	2,00	13,10
M 16	2,00	15,10

Values shown are given for guidance only.
Forming drill size is influenced by:
– component material
– thread profile
– drilling depth
– wall thickness
– desired minor diameter

Sizes in brackets are not ISO Standard.

Unified Coarse Thread

Major dia.	Forming drill sizes mm
2 -56 UNC	1,97
3 -48 UNC	2,26
4 -40 UNC	2,55
5 -40 UNC	2,87
6 -32 UNC	3,15
8 -32 UNC	3,80
10 -24 UNC	4,30
12 -24 UNC	5,00
1/4 -20 UNC	5,75
5/16-18 UNC	7,25
3/8 -16 UNC	8,75

Unified Fine Thread UNF

Major dia.	Forming drill sizes mm
4 -48 UNF	2,60
5 -44 UNF	2,90
6 -40 UNF	3,20
8 -36 UNF	3,85
10 -32 UNF	4,45
12 -28 UNF	5,05
1/4 -28 UNF	5,90
5/16-24 UNF	7,45
3/8 -24 UNF	9,00

Pipe Thread G

Major dia.	Pitch	Forming drill sizes mm
G 1/16	0,907	7,30
G 1/8	0,907	9,30
G 1/4	1,337	12,50
G 3/8	1,337	16,00
G 1/2	1,814	20,10

Metric ISO Fine Thread

Major dia.	Pitch mm	Forming drill sizes mm
M 4	0,5	3,80
M 5	0,5	4,80
M 6	0,5	5,80
M 8	0,5	7,80
M 6	0,75	5,65
M 8	0,75	7,65
M 10	0,75	9,65
M 8	1	7,55
M 10	1	9,55
M 12	1	11,55
M 14	1	13,55
M 16	1	15,55
M 18	1	17,55
M 12	1,5	11,30
M 14	1,5	13,30
M 16	1,5	15,30
M 18	1,5	17,30
M 20	1,5	19,30