

AN AMERICAN NATIONAL STANDARD

GLEARANGE HOLES FOR BOLTS, SCREWS, AND STUDS

ASME B18.2.8-1999

TABLE 1 INCH CLEARANCE HOLE ALLOWANCES

Nominal Screw Size	Fit Classes				
	Normal	Close	Loose		
#0-#4	1/64	0.008	1/32		
#5-7/16	1/32 1/16	1/64	3/ ₆₄ 7/ ₆₄ 5/ ₃₂		
1/2 , 5/8	1/16	1/32	7/84		
3/4 , 1/B	1/16	1/32	5/32		
1	3/32	1/32	5/32		
11/8 , 11/4	3/ ₃₂ 3/ ₃₂	1/32	5/32 3/16		
13/8 , 11/2	1/8	1/16	15/64		

TABLE 2 CLEARANCE HOLES FOR INCH FASTENERS

	Fit Classes									
	Normal			Close			Loose			
Nominal Screw	Nominal	Hole Di	ameter	Nominal	Hole Di	ameter	Nominal	Hole Diameter		
Size	Drill Size	Min.	Мах.	Drill Size	Min.	Мах.	Drill Size	Min.	Мах.	
#0	#48	0.076	0.082	#51	0.067	0.071	3/32	0.094	0.104	
#1	#43	0.089	0.095	#46	0.081	0.085	#37	0.104	0.114	
#2	#38	0.102	0.108	3/32	0.094	0.098	#32	0.116	0.126	
#3	#32	0.116	0.122	#36	0.106	0.110	#30	0.128	0.140	
#4	#30	0.128	0.135	#31	0.120	0.124	#27	0.144	0.156	
#5	5/32	0.156	0.163	9/64	0.141	0.146	11/64	0.172	0.184	
#6 #8	#18	0.170	0.177	#23	0.154	0.159	#13	0.185	0.197	
#8	#9	0.196	0.203	#15	0.180	0.185	#3	0.213	0.225	
#10	#2	0.221	0.228	#5	0.206	0.211	В	0.238	0.250	
1/4	9/32	0.281	0.290	17/64	0.266	0.272	19/64	0.297	0.311	
5/16	11/22	0.344	0.354	21/04	0.328	0.334	23/64	0.359	0.373	
5/16 3/8	13/22	0.406	0.416	25/64	0.391	0.397	27/64	0.422	0.438	
7/16	13/32	0.469	0.479	29/64	0.453	0.460	31/04	0.484	0.500	
1/2	1/10	0,562	0.572	1/32	0.531	0,538	39/24	0.609	0.625	
1/2 5/8 3/4 7/8	11/16	0.688	0.698	21/22	0.656	0.663	41/04	0.734	0.754	
3/4	13/20	0.812	0.824	25/22	0.781	0.789	29/32	0.906	0.926	
7/8	15/16	0.938	0.950	23/32	0.906	0.914	11/32	1.031	1.05	
1	13/32	1.094	1.106	11/32	1.031	1.039	15/32	1.156	1.18	
11/8	17/32	1.219	1.235	15/32	1.156	1.164	15/16	1.312	1.337	
11/4	111/32	1.344	1.360	19/32	1.281	1.291	17/16	1.438	1.463	
13/2	11/2	1.500	1.516	17/16	1.438	1.448	1 ³⁹ / ₆₄	1.609	1.634	
11/2	15/8	1.625	1.641	19/16	1.562	1.572	147/64	1.734	1.759	

GENERAL NOTE: Dimensions are in inches.

TABLE 3 CLEARANCE HOLES FOR METRIC FASTENERS

				Fit	t Classes					
		Normal			Close			Loose		
Nominal	Nominal	Hole D	iameter	Nominal Hol	Hole D	iameter	Nominal	Hole Diameter		
Screw Size	Drill Size	Min.	Max.	Drill Size	Min.	Max.	Drill Size	Min.	Мах.	
M1.6	1.8	1.8	1.94	1.7	1.7	1.8	2	2	2.25	
M2	2.4	2.4	2.54	2.2	2.2	2.3	2.6	2.6	2.8	
M2.5	2.9	2.9	3.04	2.7	2.7	2.8	3.1	3.1	3.4	
M3	3.4	3.4	3.58	3.2	3.2	3.32	3.6	3.6	3.9	
M4	4.5	4.5	4.68	4.3	4.3	4.42	4.8	4.8	5.1	
M5	5.5	5.5	5.68	5.3	5.3	5.42	5.8	5.8	6.1	
M6	6.6	6.6	6.82	6.4	6.4	6.55	7	7	7.3	
M8	9	9	9.22	8.4	8.4	8.55	10	10	10.3	
M10	11	11	11.27	10.5	10.5	10.68	12	12	12.4	
M12	13.5	13.5	13.77	13	13	13.18	14.5	14.5	14.9	
M14	15.5	15.5	15.77	15	15	15.18	16.5	16.5	16.9	
M16	17.5	17.5	17.77	17	17	17.18	18.5	18.5	19.0	
M20	22	22	22.33	21	21	21.21	24	24	24.5	
M24	26	26	26.33	25	25	25.21	28	28	28.5	
M30	33	33	33.39	31	31	31.25	35	35	35.6	
M36	39	39	39.39	37	37	37.25	42	42	42.6	
M42	45	45	45.39	43	43	43.25	48	48	48.6	
M48	52	52	52.46	50	50	50.25	56	56	56.7	
M56	62	62	62.46	58	58	58.3	66	66	66.7	
M64	70	70	70.46	66	66	66.3	74	74	74.7	
M72	78	78	78.46	74	74	74.3	82	82	82.8	
M80	86	86	86.54	82	82	82.35	91	91	91.8	
M90	96	96	96.54	93	93	93.35	101	101	101.8	
M100	107	107	107.54	104	104	104.35	112	112	112.8	

GENERAL NOTE: Dimensions are in millimeters.

TABLE 4 METRIC CLEARANCE HOLE ALLOWANCES

Nominal		Fit Classes		
Screw Size	Normal	Close	Loose	
M-1.6	0.2	0.1	0.25	
M2	0.4	0.1	0.3	
M2.5	0.4	0.1	0.3	
M3	0.4	0.2	0.6	
M4, M5	0.5	0.3	0.8	
M6	0.6 "	0.4	1	
M8	1	0.4	2	
M10	1	0.5	2	
M12-M16	1.5	1	2.5	
M20, M24	2	1	4	
M30	3	1	5	
M36, M42	3	1	6	
M48	4	2	8	
M56-M72	6	2	10	
M80 6		2	11	
M90	6	3	11	
M100	7	4	12	

GENERAL NOTE: Dimensions are in millimeters.

I-1 RECOMMENDED SUBSTITUTE DRILLS

If the clearance hole application is dimensioned in metric drill sizes for inch fasteners or inch drill sizes for metric fasteners, Tables I-1 and I-2 list the nearest standard drill size translations for the designated drills of Tables 2 and 3.

TABLE I-1 STANDARD METRIC DRILLS FOR INCH FASTENERS

TABLE I-2 STANDARD INCH DRILLS FOR METRIC FASTENERS

William P. William St. William St.				WETHO POLICE				
	Nomi	nal Drill Size,	mm		Nom	inal Drill Siz	e, in.	
Nominal		Fit Classes		Nominal	Fit Classes			
Screw Size, in.	Normal	Close	Loose	Screw Size, mm	Normal	Close	Loose	
	••			M1.6	#50	#51	#47	
#0	1.9	1.7	2.4	M2 M2.5	3/32	#44	#38	
#1	2.25	2.05	2.6		#33	#36	#31	
#2	2.6	2.4	2.9				•	
#3	2.9	2.7	3.3	M3	#29	1/8	9/64	
#4	3.3	3	3.7	M4	#16	#19	#12	
#5	4	3.6	4.4	M5	7/32	#4	#1	
113	4	3.0	4.4	140	•	1,	1	
#6	4.3	3.9	4.7	M6	G	1/4	J 25/84	
#8	5	4.6	5.4	M8	T	Q Z	31/64	
#10	5.6	5.2	6	M10	7/16	2	/64	
•				M12	17/32	33/64	37/64	
1/4	7.1	6.7	7.5	M14	39/64	19/32	21/32	
5/15	8.7	8.3	9.1	M16	11/32	43/64	47/64	
3/8	10.2	9.9	10.5					
7/16	11.8	11.5	12.2	M20	55/64	53/64	15/16	
16	14.25	13.5	15.5	M24	11/32	63/64	17/64	
1/2 5/8	17.5	16.75	19	M30	19/32	17/32	13/8	
	17.0	10.70	10	M36	117/32	115/32	121/32	
3/4	20.5	20	23	M42	1 ²⁵ / ₃₂	111/16	1 ²⁹ / ₃₂	
7/8	24	23	26	M48	21/32	131/32	2 ³ / ₁₆	
1	27.5	26	29.5	19140	2/32	1 /32		
-14	24	20.5	22.5	M56	27/16	25/16	2 ⁵ / ₈ 2 ⁵ / ₁₆	
11/8	31	29.5	33.5	M64	23/4	25/8	25/16	
11/4	34	32.5	36.5	M72	31/8	215/16	31/4	
13/8	38	36.5	41					
11/2	41	39.5	44					

Tap drill size	Thread pitch (mm)	Thread count (TPI)	Diameter (mm)	Diameter (in)	Tap size
1/64 in	0.159	160	0.5334	0.0210	#0000-160
#71	0.212	120	0.8636	0.0340	#000-120
#65	0.282	90	1,1938	0.0470	#00-90
3/64 in	0.318	80	1.5240	0.0600	#0-80
#52	0.397	64	1.8542	0.0730	#1-64
#53	0.353	72	1.8542	0.0730	#1-72
#50	0.454	56	2.1844	0.0860	#2-56
#50	0.397	64	2.1844	0.0860	#2-64
#47	0.529	48	2.5146	0.0990	#3-48
#45	0.454	56	2.5146	0.0990	#3-56
#43	0.635	40	2.8448	0.1120	#4-40
#42	0.529	48	2.8448	0.1120	#4-48
#39	0.635	40	3,1750	0.1250	#5-40
#37	0.577	44	3.1750	0.1250	#5-44
#36	0.794	32	3.5052	0.1380	#6-32
#33	0.635	40	3.5052	0.1380	#6-40
#29	0.794	32	4.1656	0.1640	#8-32
#29	0.706	36	4.1656	0.1640	#8-36
#21	0.794	32	4.8260	0.1900	#10-32
#25	1.058	24	4.8260	0.1900	#10-32
#17	1.058	24	5.4864	0.2160	#12-24
#15	0.907	28	5.4864	0.2160	#12-24
#7	1.270	20	6.3500	0.2500	1/4-20
#3	0.907	28	6.3500	0.2500	1/4-28
F	1.411	18	7.9375	0.2500	5/16-18
		24	7.9375		5/16-16
415	1.058			0.3125	110000000000000000000000000000000000000
Q Eac:-	1.058	24	9.5250	0.3750	3/8-24
5/16 in	1.588	16	9.5250	0.3750	3/8-16
U	1,814	14	11.1125	0.4375	7/16-14
25/64 in	1.270	20	11.1125	0.4375	7/16-20
29/64 in	1.270	20	12.7000	0.5000	1/2-20
27/64 in	1.954	13	12.7000	0.5000	1/2-13
33/64 in	1.411	18	14.2875	0.5625	9/16-18
31/64 in	2.117	12	14.2875	0.5625	9/16-12
37/64 in	1.411	18	15.8750	0.6250	5/8-18
17/32 in	2.309	11	15.8750	0.6250	5/8-11
11/16 in	1.588	16	19.0500	0.7500	3/4-16
21/32 in	2.540	10	19.0500	0.7500	3/4-10
49/64 in	2.822	9	22.2250	0.8750	7/8-9
13/16 in	1.814	14	22.2250	0.8750	7/8-14
15/16 in	1.814	14	25.4000	1.0000	1-14
7/8 in	3.175	8	25.4000	1.0000	1-8
1 3/64 in	2.117	12	28.5750	1.1250	1 1/8-12
63/64 in	3.629	7	28.5750	1.1250	1 1/8-7
1 11/64 in	2.117	12	31.7500	1.2500	1 1/4-12
1 7/64 in	3.629	7	31.7500	1.2500	1 1/4-7
1 27/64 in	2.117	12	38.1000	1.5000	1 1/2 -12
1 11/32 in	4.233	6	38,1000	1.5000	1 1/2-6
1 43/64 in	2.117	12	44.4500	1.7500	1 3/4-12
1 35/64 in	5.080	5	44.4500	1.7500	1 3/4-5
1 59/64 in	2.117	12	50.8000	2.0000	2-12
1 25/32 in	5.644	4.5	50.8000	2.0000	2-4 1/2

Tap size	Diameter (in)	Diameter (mm)	Thread count (TPI)	Thread pitch (mm)	Tap drill size
M1x0.2	0.0394	1.0000	~127	0.200	0.8 mm
M1x0.25	0.0394	1.0000	~102	0.250	0.75 mm
M1.1x0.25	0.0433	1.1000	~102	0.250	0.85 mm
M1.1x0.2	0.0433	1,1000	~127	0.200	0.9 mm
M1.2x0.2	0.0472	1.2000	~127	0.200	1 mm
M1.2x0.25	0.0472	1,2000	~102	0.250	0.95 mm
M1.4x0.2	0.0551	1.4000	~127	0.200	1.2 mm
M1.4x0.3	0.0551	1.4000	~85	0.300	1.1 mm
M1.6x0.2	0.0630	1.6000	~127	0.200	1.4 mm
M1.6x0.35	0.0630	1.6000	~73	0.350	1.25 mm
M1.8x0.2	0.0709	1.8000	~127	0.200	1.6 mm
M1.8x0.35	0.0709	1.8000	~73	0.350	1.45 mm
M2x0.25	0.0787	2.0000	~102	0.250	1.75 mm
M2x0.4	0.0787	2.0000	~64	0.400	1.6 mm
M2.2x0.25	0.0866	2.2000	~102	0.250	1.95 mm
M2.2x0.45	0.0866	2.2000	~57	0.450	1.75 mm
M2.5x0.35	0.0984	2,5000	~73	0.350	2.1 mm
M2.5x0.45	0.0984	2.5000	~57	0.450	2.05 mm
M3x0.35	0.1181	3.0000	~73	0.350	2.6 mm
M3x0.5	0.1181	3.0000	~51	0.500	2.5 mm
M3.5x0.35	0.1378	3.5000	~73	0.350	3.1 mm
M3.5x0.6	0.1378	3.5000	~43	0.600	2.9 mm
M4x0.35	0.1575	4.0000	~73	0.350	3.6 mm
M4x0.5	0.1575	4.0000	~51	0.500	3.5 mm
M4x0.7	0.1575	4.0000	~37	0.700	3.3 mm
M4.5x0.5	0.1772	4.5000	~51	0.500	4 mm
M4.5x0.75	0.1772	4.5000	~34	0.750	3.8 mm
M5x0.5	0.1969	5.0000	~51	0.500	4.5 mm
M5x0.8	0.1969	5.0000	~32	0.800	4.2 mm
M5.5x0.5	0.2165	5.5000	~51	0.500	5 mm
M6x0.5	0.2362	6.0000	~51	0.500	5.5 mm
M6x0.75	0.2362	6.0000	~34	0.750	5.2 mm
M6x1	0.2362	6.0000	~26	1.000	5 mm
M7x0.75	0.2756	7.0000	~34	0.750	6.2 mm
MZx1	0.2756	7.0000	~26	1.000	6 mm
M8x0.5	0.3150	8.0000	~51	0.500	7.5 mm
M8x0.75	0.3150	8.0000	~34	0.750	7.2 mm
M8x1	0.3150	8.0000	~26	1.000	7 mm
M8x1.25	0.3150	8.0000	~21	1.250	6.8 mm
M9x0.75	0.3543	9.0000	~34	0.750	8.2 mm
M9x1	0.3543	9.0000	~26	1.000	8 mm
M9x1.25	0.3543	9.0000	~21	1.250	7.8 mm
M10x0.75	0.3937	10.0000	~34	0.750	9.2 mm
M10x1.5	0.3937	10.0000	~17	1.500	8.5 mm
M10x1.25	0.3937	10.0000	~21	1.250	8.8 mm
M10x1	0.3937	10.0000	~26	1.000	9 mm
M11x0.75	0.4331	11.0000	~34	0.750	10.2 mm
M11x1	0.4331	11.0000	~26	1.000	10.2 mm
M11x1.5	0.4331	11.0000	~17	1.500	9.5 mm
M12x1.5	0.4724	12.0000	~17	1.500	10.5 mm
M12x1.75	0.4724	12.0000	~15	1.750	10.2 mm
M12x0.75	0.4724	12.0000	~34	0.750	11.25 mm
M12x0.75	0.4724	12.0000	~26	1.000	11.25 mm

M12x1.25	0.4724	12.0000	~21	1.250	10.8 mm
M14x1.5	0.5512	14.0000	~17	1.500	12.5 mm
M14x1.25	0.5512	14.0000	~21	1.250	12.8 mm
M14x1	0.5512	14.0000	~26	1.000	13 mm
M14x2	0.5512	14.0000	~13	2.000	12 mm
M15x1	0.5906	15.0000	~26	1.000	14 mm
M15x1.5	0.5906	15.0000	~17	1.500	13.5 mm
M16x2	0.6299	16.0000	~13	2.000	14 mm
M16x1.5	0.6299	16.0000	~17	1.500	14.5 mm
M16x1	0.6299	16.0000	~26	1.000	15 mm
M17x1	0.6693	17.0000	~26	1.000	16 mm
M17x1.5	0.6693	17.0000	~17	1.500	15.5 mm
M18x2.5	0.7087	18.0000	~11	2.500	15.5 mm
M18x1	0.7087	18.0000	~26	1.000	17 mm
M18x1.5	0.7087	18.0000	~17	1.500	16.5 mm
M18x2	0.7087	18.0000	~13	2.000	16 mm
M20x2	0.7874	20.0000	~13	2.000	18 mm
M20x1.5	0.7874	20.0000	~17	1.500	18.5 mm
M20x1	0.7874	20.0000	~26	1.000	19 mm
M20x2.5	0.7874	20.0000	~11	2.500	17.5 mm
M22x2	0.8661	22.0000	~13	2.000	20 mm
M22x1.5	0.8661	22.0000	~17	1.500	20.5 mm
M22x1	0.8661	22.0000	~26	1.000	21 mm
M22x2.5	0.8661	22.0000	~11	2.500	19.5 mm
M24x3	0.9449	24.0000	~9	3.000	21 mm
M24x1	0.9449	24.0000	~26	1.000	23 mm
M24x1.5	0.9449	24.0000	~17	1.500	22.5 mm
M24x2	0.9449	24.0000	~13	2.000	22 mm
M25x2	0.9843	25.0000	~13	2.000	23 mm
M25x1	0.9843	25.0000	~26	1.000	24 mm
M25x1.5	0.9843	25.0000	~17	1.500	23.5 mm
M26x1.5	1.0236	26.0000	~17	1.500	24.5 mm
M27x1.5	1.0630	27.0000	~17	1.500	25.5 mm
M27x3	1.0630	27.0000	~9	3.000	24 mm
M27x1	1.0630	27.0000	~26	1.000	26 mm
M27x2	1.0630	27.0000	~13	2.000	25 mm
M28x2	1.1024	28.0000	~13	2.000	26 mm
M28x1	1.1024	28.0000	~26	1.000	27 mm
M28x1.5	1.1024	28.0000	~17	1.500	26.5 mm
M30x1.5	1.1811	30.0000	~17	1.500	28.5 mm
M30x3.5	1.1811	30.0000	~8	3.500	26.5 mm
M30x2	1.1811	30.0000	~13	2.000	28 mm
M33x2	1.2992	33.0000	~13	2.000	31 mm
M33x3.5	1.2992	33.0000	~8	3.500	29.5 mm
M36x3	1.4173	36.0000	~9	3.000	33 mm
M36x4	1.4173	36.0000	~7	4.000	32 mm
M39x4	1.5354	39.0000	~7	4.000	35 mm
M39x3	1.5354	39.0000	~9	3.000	36 mm
M42x4.5	1.6535	42.0000	~6	4.500	37.5 mm
M45x4.5	1.7717	45.0000	~6	4.500	40.5 mm
M48x5	1.8898	48.0000	~6	5.000	43 mm
M52x5	2.0472	52.0000	~6	5.000	47 mm
M56x5.5	2.2047	56.0000	~5	5.500	50.5 mm
M60x5.5	2.3622	60.0000	~5	5.500	54.5 mm
M64x6	2.5197	64.0000	~5	6.000	300000000000000000000000000000000000000
MO4XO	2.013/	68.0000	~5	0.000	58 mm