

16. Bored hole size before tapping (for thread forming)

■ for Metric Threads

unit: mm

Size	Class	Hole size depending on percentage of thread engagement			ref. Minor diameter of internal threads (5H/6H)	
		100%	90%	80%	Max.	Min.
M1 × 0.25	G4	0.89	0.90	0.92	0.785	0.729
	G5	0.90	0.91	0.93		
M1.2 × 0.25	G4	1.09	1.10	1.11	0.983	0.929
	G5	1.10	1.11	1.13		
M1.4 × 0.3	G4	1.26	1.28	1.30	1.142	1.075
	G5	1.28	1.29	1.31		
M1.6 × 0.35	G4	1.43	1.44	1.46	1.321	1.221
	G5	1.44	1.46	1.48		
※ M1.7 × 0.35	G4	1.52	1.54	1.56	1.421	1.321
	G5	1.54	1.56	1.58		
	G6	1.55	1.57	1.59		
M1.8 × 0.35	G4	1.62	1.64	1.66	1.521	1.421
	G5	1.64	1.66	1.68		
M2 × 0.4	G4	1.79	1.81	1.83	1.679	1.567
	G5	1.80	1.82	1.84		
	G6	1.81	1.83	1.86		
M2 × 0.25	G4	1.89	1.90	1.91	1.785	1.729
	G5	1.90	1.91	1.93		
M2.2 × 0.45	G5	1.98	2.00	2.02	1.838	1.713
※ M2.3 × 0.4	G4	2.09	2.11	2.13	1.979	1.867
	G5	2.10	2.12	2.14		
	G6	2.11	2.13	2.16		
M2.5 × 0.45	G5	2.27	2.30	2.32	2.138	2.013
	G6	2.29	2.31	2.44		
M2.5 × 0.35	G5	2.34	2.36	2.37	2.221	2.121
※ M2.6 × 0.45	G5	2.37	2.40	2.42	2.238	2.113
	G6	2.39	2.41	2.44		
※ M2.6 × 0.35	G5	2.44	2.45	2.47	2.321	2.221
M3 × 0.5	G5	2.75	2.78	2.80	2.599	2.459
	G6	2.76	2.79	2.82		
	G7	2.77	2.80	2.83		
	G8	2.79	2.81	2.84		
M3 × 0.35	G5	2.79	2.84	2.86	2.721	2.621
M3.5 × 0.6	G5	3.19	3.22	3.25	3.010	2.850
	G6	3.20	3.23	3.26		
	G7	3.21	3.24	3.28		
M3.5 × 0.35	G5	3.32	3.34	3.36	3.221	3.121
	G6	3.33	3.35	3.37		
M4 × 0.7	G5	3.65	3.67	3.71	3.422	3.242
	G6	3.65	3.69	3.72		
	G7	3.66	3.70	3.74		
	G8	3.67	3.71	3.75		
M4 × 0.5	G5	3.75	3.77	3.80	3.599	3.459
	G6	3.76	3.79	3.81		

Size	Class	Hole size depending on percentage of thread engagement			ref. Minor diameter of internal threads (5H/6H)	
		100%	90%	80%	Max.	Min.
M5 × 0.8	G5	4.57	4.62	4.66	4.334	4.134
	G6	4.59	4.63	4.67		
	G7	4.60	4.64	4.68		
	G8	4.61	4.65	4.70		
M5 × 0.5	G7	4.77	4.80	4.82	4.599	4.459
M6 × 1	G5	5.46	5.51	5.57	5.153	4.917
	G6	5.47	5.53	5.58		
	G7	5.49	5.54	5.59		
	G8	5.50	5.55	5.61		
M6 × 0.75	G6	5.61	5.65	5.69	5.378	5.188
	G7	5.62	5.66	5.70		
※ M6 × 0.5	G6	5.76	5.78	5.81	5.599	5.459
M7 × 1	G6	6.47	6.52	6.58	6.153	5.917
	G7	6.48	6.54	6.59		
M7 × 0.75	G7	6.62	6.66	6.70	6.378	6.188
M8 × 1.25	G7	7.36	7.43	7.49	6.912	6.647
	G8	7.37	7.44	7.51		
M8 × 1	G7	7.48	7.54	7.59	7.153	6.917
M8 × 0.75	G7	7.62	7.66	7.70	7.378	7.188
M10 × 1.5	G7	9.22	9.30	9.38	8.676	8.376
	G8	9.23	9.31	9.39		
M10 × 1.25	G7	9.35	9.42	9.49	8.912	8.647
	G8	9.37	9.43	9.50		
M10 × 1	G7	9.48	9.53	9.59	9.153	8.917
M12 × 1.75	G8	11.09	11.19	11.28	10.441	10.106
	G9	11.11	11.20	11.29		
M12 × 1.5	G8	11.22	11.30	11.38	10.676	10.376
	G9	11.23	11.31	11.39		
M12 × 1.25	G8	11.35	11.42	11.49	10.912	10.647
	G9	11.36	11.43	11.50		
M12 × 1	G7	11.47	11.53	11.58	11.153	10.917
M14 × 2	G9	12.97	13.07	13.18	12.210	11.835
	G10	12.98	13.09	13.19		
M14 × 1.5	G9	13.22	13.31	13.39	12.676	12.376
M14 × 1	G8	13.48	13.54	13.59	13.153	12.917
M16 × 2	G9	14.96	15.07	15.18	14.210	13.835
	G10	14.97	15.08	15.19		
M16 × 1.5	G9	15.22	15.30	15.38	14.676	14.376
M16 × 1	G8	15.48	15.53	15.59	15.153	14.917
M18 × 1.5	G9	17.22	17.30	17.38	16.676	16.376
M20 × 2.5	G11	18.72	18.86	18.99	17.744	17.294
M20 × 1.5	G9	19.21	19.29	19.37	18.676	18.376
	G10	19.22	19.31	19.39		

Sizes with * mark are deleted from JIS.

unit: mm

■ for Unified Threads

Size	Class	Hole size depending on percentage of thread engagement			ref. Minor diameter of internal threads (2B)	
		100%	90%	80%	Max.	Min.
No. 0 - 80UNF	G5	1.39	1.41	1.42	1.305	1.182
No. 1 - 64UNC	G5	1.68	1.70	1.72	1.582	1.425
No. 1 - 72UNF	G5	1.70	1.72	1.74	1.612	1.474
No. 2 - 56UNC	G4	1.96	1.98	2.01	1.871	1.695
	G5	1.97	1.99	2.02		
	G6	1.98	2.01	2.03		
	G7	2.00	2.02	2.04		
No. 2 - 64UNF	G4	1.98	2.01	2.03	1.912	1.756
	G5	2.00	2.02	2.04		
No. 3 - 48UNC	G4	2.25	2.28	2.31	2.146	1.941
	G5	2.26	2.29	2.32		
No. 3 - 56UNF	G4	2.29	2.31	2.34	2.197	2.025
	G5	2.30	2.32	2.35		
No. 4 - 40UNC	G5	2.54	2.57	2.61	2.385	2.157
	G6	2.55	2.59	2.62		
	G7	2.57	2.60	2.63		
No. 4 - 48UNF	G5	2.59	2.62	2.65	2.458	2.271
	G6	2.61	2.63	2.66		
No. 5 - 40UNC	G5	2.87	2.90	2.94	2.697	2.487
	G6	2.88	2.92	2.95		
No. 5 - 44UNC	G5	2.90	2.93	2.96	2.740	2.551
	G6	2.91	2.94	2.97		
No. 6 - 32UNC	G5	3.11	3.15	3.19	2.895	2.642
	G6	3.12	3.16	3.21		
	G7	3.13	3.18	3.22		
No. 6 - 40UNF	G5	3.19	3.22	3.26	3.022	2.820
	G6	3.20	3.23	3.27		
	G7	3.21	3.25	3.28		

Size	Class	Hole size depending on percentage of thread engagement			ref. Minor diameter of internal threads (2B)	
		100%	90%	80%	Max.	Min.
No. 8 - 32UNC	G6	3.78	3.82	3.87	3.530	3.302
	G7	3.79	3.84	3.88		
	G8	3.81	3.85	3.89		
No. 8 - 36UNF	G5	3.81	3.85	3.89	3.606	3.404
	G6	3.82	3.86	3.90		
No. 10 - 24UNC	G6	4.30	4.35	4.41	3.962	3.683
	G7	4.31	4.37	4.42		
No. 10 - 32UNF	G6	4.44	4.48	4.53	4.165	3.963
	G7	4.45	4.50	4.54		
No. 12 - 24UNC	G6	4.96	5.01	5.07	4.597	4.344
	G7	4.97	5.03	5.08		
No. 12 - 28UNF	G6	5.03	5.08	5.13	4.724	4.496
	G7	5.04	5.09	5.14		
1/4 - 20UNC	G6	5.71	5.78	5.85	5.257	4.979
	G7	5.73	5.80	5.86		
	G8	5.74	5.81	5.88		
1/4 - 28UNF	G6	5.89	5.94	5.99	5.588	5.360
	G7	5.91	5.95	6.00		
5/16 - 18UNC	G7	7.23	7.31	7.38	6.731	6.401
5/16 - 24UNF	G7	7.42	7.47	7.53	7.035	6.782
3/8 - 16UNC	G7	8.72	8.80	8.89	8.153	7.798
	G8	8.73	8.81	8.90		
3/8 - 24UNF	G7	8.99	9.04	9.10	8.636	8.382
	G8	9.00	9.06	9.11		
7/16 - 14UNC	G8	10.20	10.30	10.40	9.550	9.144
7/16 - 20UNF	G8	10.48	10.55	10.62	10.033	9.729
1/2 - 13UNC	G8	11.70	11.81	11.92	11.023	10.592
1/2 - 20UNF	G8	12.06	12.13	12.20	11.607	11.329

■ for Helical Coil Wire Screw Thread Inserts unit: mm

Size	Class	Hole size depending on percentage of thread engagement			
		Min.		Max.	
STI M3 × 0.5	G3	3.40	100%	3.45	80%
STI M4 × 0.7	G4	4.56	100%	4.61	85%
STI M5 × 0.8	G4	5.63	100%	5.70	85%
STI M6 × 1	G4	6.82	100%	6.90	85%
STI M8 × 1.25	G4	9.00	100%	9.11	85%
STI M10 × 1.5	G5	11.21	100%	11.30	90%
STI M12 × 1.75	G6	13.42	100%	13.57	85%

■ SURZ SURZ adopts special design on the thread root of tap, and is applicable to the control of minor diameter of internal threads and seams of thread crests. unit: mm

Size	Class	Recommended bored hole sizes	Size	Class	Recommended bored hole sizes
M1 × 0.25	G4	0.90	M2.3 × 0.4	G4	2.12
M1.2 × 0.25	G4	1.10	M2.5 × 0.45	G4	2.30
M1.4 × 0.3	G4	1.28	M2.6 × 0.45	G5	2.40
M1.6 × 0.35	G4	1.46	M3 × 0.5	G5	2.77
M1.6 × 0.2	G3	1.52	No. 2 - 56UNC	G4	1.98
M1.7 × 0.35	G4	1.56	No. 4 - 40UNC	G5	2.55
M2 × 0.4	G4	1.82	No. 6 - 32UNC	G5	3.14

*Recommended bored hole sizes shown above aim at 90% percentage of thread engagement, and are decided by paying attention to tap breakage possibility based on our test results.

*Material deformation can slightly change depending on material, hardness and shape of workpiece and cutting condition, and hole sizes should be changed accordingly. Please choose the suitable bored hole size.

■ for Miniature Screw Threads unit: mm

Size	Class	Max.	Min.
S0.6 × 0.15	GS2	0.55	0.54
S0.7 × 0.175	GS3	0.64	0.62
S0.8 × 0.2	GS3	0.73	0.71
S0.9 × 0.225	GS4	0.82	0.80

Concerning bored hole sizes for metric extra fine screw series, please contact Yamawa or The Japan Research Institute for Screw Thread and Fastener.