

17. Bar diameter for external threads (for cutting type dies)

■ Metric threads

Size	major diameter of external threads				bar diameter (ref.)	
	ISO		old JIS		ISO	
	d _{max}	d _{min}	d _{max}	d _{min}		
M1 × 0.25	1.000	0.933	0.985	0.940	0.95	0.95
M1 × 0.2	1.000	0.944	0.980	0.930	0.96	0.94
M1.1 × 0.25	1.100	1.033	1.100	1.033	1.05	1.05
M1.1 × 0.2	1.100	1.044	1.100	1.044	1.06	1.06
M1.2 × 0.25	1.200	1.133	1.185	1.140	1.15	1.15
M1.2 × 0.2	1.200	1.144	1.180	1.130	1.16	1.14
M1.4 × 0.3	1.400	1.325	1.380	1.320	1.34	1.34
M1.4 × 0.2	1.400	1.344	1.380	1.330	1.36	1.34
M1.6 × 0.35	1.581	1.496	1.581	1.496	1.52	1.52
M1.6 × 0.2	1.583	1.527	1.583	1.527	1.54	1.54
M1.7 × 0.35	1.681	1.596	1.680	1.610	1.62	1.63
M1.7 × 0.2	1.683	1.627	1.680	1.630	1.64	1.64
M1.8 × 0.35	1.781	1.696	1.781	1.696	1.72	1.72
M1.8 × 0.2	1.783	1.727	1.783	1.727	1.74	1.74
M2 × 0.4	1.981	1.886	1.980	1.890	1.91	1.91
M2 × 0.25	1.982	1.915	1.980	1.930	1.93	1.94
M2.2 × 0.45	2.180	2.080	2.180	2.080	2.11	2.11
M2.2 × 0.25	2.182	2.115	2.182	2.115	2.13	2.13
M2.3 × 0.4	2.281	2.186	2.280	2.190	2.21	2.21
M2.3 × 0.25	2.282	2.215	2.280	2.230	2.23	2.24
M2.5 × 0.45	2.480	2.380	2.480	2.380	2.41	2.41
M2.5 × 0.35	2.481	2.396	2.481	2.396	2.42	2.42
M2.6 × 0.45	2.580	2.480	2.580	2.480	2.51	2.51
M2.6 × 0.35	2.581	2.496	2.580	2.480	2.52	2.51
M3 × 0.5	2.980	2.874	2.980	2.874	2.90	2.90
M3 × 0.35	2.981	2.896	2.980	2.880	2.92	2.91
M3.5 × 0.6	3.479	3.354	3.470	3.360	3.39	3.39
M3.5 × 0.35	3.481	3.396	3.480	3.380	3.42	3.41
M4 × 0.7	3.978	3.838	3.978	3.838	3.87	3.87
M4 × 0.5	3.980	3.874	3.970	3.860	3.90	3.89
M4.5 × 0.75	4.478	4.338	4.470	4.340	4.37	4.37
M4.5 × 0.5	4.480	4.374	4.470	4.360	4.40	4.39
M5 × 0.8	4.976	4.826	4.976	4.826	4.86	4.86
M5 × 0.5	4.980	4.874	4.970	4.860	4.90	4.89
M5.5 × 0.5	5.480	5.374	5.470	5.360	5.40	5.39
M6 × 1	5.974	5.794	5.970	5.820	5.84	5.86
M6 × 0.75	5.978	5.838	5.970	5.850	5.87	5.88
M7 × 1	6.974	6.794	6.970	6.820	6.84	6.86
M7 × 0.75	6.978	6.838	6.970	6.850	6.87	6.88
M8 × 1.25	7.972	7.760	7.960	7.790	7.81	7.83
M8 × 1	7.974	7.794	7.970	7.830	7.84	7.87
M8 × 0.75	7.978	7.838	7.970	7.830	7.87	7.87
M9 × 1.25	8.972	8.760	8.960	8.790	8.81	8.83
M9 × 1	8.974	8.794	8.970	8.830	8.84	8.87

ISO tolerance area Class 6g (M1.6 and larger) 6h (M1.4 and smaller) old JIS 2nd class
old JIS 2nd class

- ISO : from table 2 JIS B0209-2 and from table 1 JIS B0209-3
- Old JIS : from the tolerable limit size and the tolerance of metric coarse threads (for 2nd class external threads, JIS B 0209-1982 appendix 1, appendix 1 attachment 4, from the tolerable limit size and the tolerance of metric fine threads (for 2nd class external threads), JIS B 0211-1982 appendix, appendix attachment 4

unit: mm

Size	major diameter of external threads				bar diameter (ref.)	
	ISO		old JIS		ISO	
	d _{max}	d _{min}	d _{max}	d _{min}		
M9 × 0.75	8.978	8.838	8.970	8.830	8.87	8.87
M10 × 1.5	9.968	9.732	9.960	9.770	9.79	9.82
M10 × 1.25	9.972	9.760	9.960	9.810	9.81	9.85
M10 × 1	9.974	9.794	9.970	9.820	9.84	9.86
M10 × 0.75	9.978	9.838	9.978	9.838	9.87	9.87
M11 × 1.5	10.968	10.732	10.968	10.732	10.79	10.79
M11 × 1	10.974	10.794	10.970	10.820	10.84	10.86
M11 × 0.75	10.978	10.838	10.978	10.838	10.87	10.87
M12 × 1.75	11.966	11.701	11.950	11.760	11.8	11.8
M12 × 1.5	11.968	11.732	11.960	11.790	11.8	11.8
M12 × 1.25	11.972	11.760	11.972	11.760	11.8	11.8
M12 × 1	11.974	11.794	11.960	11.810	11.84	11.85
M14 × 2	13.962	13.682	13.950	13.740	13.8	13.8
M14 × 1.5	13.968	13.732	13.960	13.790	13.8	13.8
M14 × 1	13.974	13.794	13.960	13.810	13.84	13.85
M15 × 1.5	14.968	14.732	14.960	14.790	14.8	14.8
M15 × 1	14.974	14.794	14.960	14.810	14.84	14.85
M16 × 2	15.962	15.682	15.950	15.740	15.8	15.8
M16 × 1.5	15.968	15.732	15.960	15.790	15.8	15.8
M16 × 1	15.974	15.794	15.960	15.810	15.84	15.85
M17 × 1.5	16.968	16.732	16.968	16.732	16.8	16.8
M17 × 1	16.974	16.794	16.974	16.794	16.84	16.84
M18 × 2.5	17.958	17.623	17.950	17.710	17.7	17.8
M18 × 2	17.962	17.682	17.950	17.650	17.8	17.7
M18 × 1.5	17.968	17.732	17.950	17.780	17.8	17.8
M18 × 1	17.974	17.794	17.960	17.810	17.84	17.85
M20 × 2.5	19.958	19.623	19.950	19.710	19.7	19.8
M20 × 2	19.962	19.682	19.950	19.650	19.8	19.7
M20 × 1.5	19.968	19.732	19.950	19.780	19.8	19.8
M20 × 1	19.974	19.794	19.960	19.810	19.84	19.85
M22 × 2.5	21.958	21.623	21.950	21.710	21.7	21.8
M22 × 2	21.962	21.682	21.950	21.650	21.8	21.7
M22 × 1.5	21.968	21.732	21.950	21.780	21.8	21.8
M22 × 1	21.974	21.794	21.960	21.810	21.84	21.85
M24 × 3	23.952	23.577	23.940	23.680	23.7	23.7
M24 × 2	23.962	23.682	23.940	23.640	23.8	23.7
M24 × 1.5	23.968	23.732	23.950	23.780	23.8	23.8
M24 × 1	23.974	23.794	23.960	23.810	23.84	23.85
M25 × 2	24.962	24.682	24.940	24.640	24.8	24.7
M25 × 1.5	24.968	24.732	24.950	24.780	24.8	24.8
M25 × 1	24.974	24.794	24.960	24.810	24.84	24.85
M26 × 1.5	25.968	25.732	25.950	25.780	25.8	25.8
M27 × 3	26.952	26.577	26.940	26.680	26.7	26.7
M27 × 2	26.962	26.682	26.962	26.682	26.8	26.8
M27 × 1.5	26.968	26.732	26.950	26.780	26.8	26.8
M27 × 1	26.974	26.794	26.974	26.794	26.84	26.84
M28 × 2	27.962	27.682	27.940	27.640	27.8	27.7
M28 × 1.5	27.968	27.732	27.950	27.780	27.8	27.8
M28 × 1	27.974	27.794	27.960	27.810	27.84	27.85
M30 × 3.5	29.947	29.522	29.940	29.660	29.6	29.7
M30 × 3	29.952	29.577	29.952	29.577	29.7	29.7

unit: mm

Size	major diameter of external threads				bar diameter (ref.)	
	ISO		old JIS		ISO	old JIS
	d _{max}	d _{min}	d _{max}	d _{min}		
M30 × 2	29.962	29.682	29.940	29.640	29.8	29.7
M30 × 1.5	29.968	29.732	29.950	29.780	29.8	29.8
M30 × 1	29.974	29.794	29.960	29.810	29.84	29.85
M32 × 2	31.962	31.682	31.940	31.640	31.8	31.7
M32 × 1.5	31.968	31.732	31.950	31.780	31.8	31.8
M33 × 3.5	32.947	32.522	32.940	32.660	32.6	32.7
M33 × 3	32.952	32.577	32.952	32.577	32.7	32.7
M33 × 2	32.962	32.682	32.962	32.682	32.8	32.8
M33 × 1.5	32.968	32.732	32.950	32.780	32.8	32.8
M35 × 1.5	34.968	34.732	34.950	34.780	34.8	34.8
M36 × 4	35.940	35.465	35.930	35.630	35.6	35.7
M36 × 3	35.952	35.577	35.952	35.577	35.7	35.7
M36 × 2	35.962	35.682	35.940	35.640	35.8	35.7
M36 × 1.5	35.968	35.732	35.950	35.780	35.8	35.8
M38 × 1.5	37.968	37.732	37.950	37.780	37.8	37.8
M39 × 4	38.940	38.465	38.930	38.630	38.6	38.7
M39 × 3	38.952	38.577	38.952	38.577	38.7	38.7
M39 × 2	38.962	38.682	38.962	38.682	38.8	38.8
M39 × 1.5	38.968	38.732	38.968	38.732	38.8	38.8
M40 × 3	39.952	39.577	39.952	39.577	39.7	39.7
M40 × 2	39.962	39.682	39.940	39.640	39.8	39.7
M40 × 1.5	39.968	39.732	39.950	39.780	39.8	39.8
M42 × 4.5	41.937	41.437	41.930	41.610	41.6	41.7
M42 × 4	41.940	41.465	41.940	41.465	41.6	41.6
M42 × 3	41.952	41.577	41.952	41.577	41.7	41.7
M42 × 2	41.962	41.682	41.940	41.640	41.8	41.7
M42 × 1.5	41.968	41.732	41.950	41.780	41.8	41.8
M45 × 4.5	44.937	44.437	44.930	44.610	44.6	44.7
M45 × 4	44.940	44.465	44.940	44.465	44.6	44.6
M45 × 3	44.952	44.577	44.952	44.577	44.7	44.7
M45 × 2	44.962	44.682	44.940	44.640	44.8	44.7
M45 × 1.5	44.968	44.732	44.950	44.780	44.8	44.8
M48 × 5	47.929	47.399	47.930	47.590	47.5	47.7
M48 × 4	47.940	47.465	47.940	47.465	47.6	47.6
M48 × 3	47.952	47.577	47.952	47.577	47.7	47.7
M48 × 2	47.962	47.682	47.940	47.640	47.8	47.7
M48 × 1.5	47.968	47.732	47.950	47.780	47.8	47.8

Unified threads (for 2A class)

Unit: mm

size	major diameter of external threads		bar diameter (ref.)
	d _{max}	d _{min}	
No.0-80UNF	1.511	1.431	1.45
No.1-64UNC	1.838	1.743	1.77
No.1-72UNF	1.838	1.751	1.77
No.2-56UNC	2.169	2.066	2.09
No.2-64UNF	2.169	2.073	2.10
No.3-48UNC	2.496	2.383	2.41
No.3-56UNF	2.496	2.393	2.42
No.4-40UNC	2.824	2.695	2.73
No.4-48UNF	2.827	2.713	2.74
No.5-40UNC	3.154	3.026	3.06
No.5-44UNF	3.157	3.036	3.07
No.6-32UNC	3.484	3.333	3.37
No.6-40UNF	3.484	3.356	3.39
No.8-32UNC	4.142	3.991	4.03
No.8-36UNF	4.145	4.006	4.04
No.10-24UNC	4.800	4.618	4.66
No.10-32UNF	4.803	4.651	4.69
No.12-24UNC	5.461	5.279	5.32
No.12-28UNF	5.461	5.296	5.34
1/4-20UNC	6.322	6.117	6.17
1/4-28UNF	6.324	6.160	6.20
5/16-18UNC	7.907	7.687	7.74
5/16-24UNF	7.909	7.727	7.77
3/8-16UNC	9.491	9.254	9.31
3/8-24UNF	9.497	9.315	9.36
7/16-14UNC	11.076	10.816	10.88
7/16-20UNF	11.079	10.874	10.93
1/2-13UNC	12.611	12.386	12.4
1/2-20UNF	12.666	12.462	12.5
9/16-12UNC	14.246	13.958	14.0
9/16-18UNF	14.251	14.031	14.1
5/8-11UNC	15.834	15.528	15.6
5/8-18UNF	15.839	15.619	15.7
3/4-10UNC	19.004	18.677	18.8
3/4-16UNF	19.011	18.774	18.8
7/8-9UNC	22.176	21.824	21.9
7/8-14UNF	22.184	21.923	22.0
1-8UNC	25.349	24.969	25.1
1-12UNF	25.354	25.065	25.1
1 1/8-7UNC	28.519	28.103	28.2
1 1/8-12UNF	28.529	28.240	28.3
1 1/4-7UNC	31.694	31.278	31.4
1 1/4-12UNF	31.704	31.415	31.5
1 3/8-6UNC	34.864	34.402	34.5
1 3/8-12UNF	34.876	34.588	34.7
1 1/2-6UNC	38.039	37.577	37.7
1 1/2-12UNF	38.051	37.763	37.8
1 3/4-5UNC	44.381	43.861	44.0
2-4.5UNC	50.726	50.168	50.3

· from table 4 JIS B 0210 and table 4 JIS B 0212

1 7. Bar diameter for external threads (for cutting type dies)

■ Sewing machine screw threads (for 2nd class)

Unit : mm

Size	major diameter of external threads		bar diameter (ref.)
	$d_{\max}$	$d_{\min}$	
1/16 SM 80	1.588	1.518	1.54
5/64 SM 64	1.984	1.904	1.92
3/32 SM 56	2.381	2.286	2.31
3/32 SM 100	2.381	2.306	2.32
1/8 SM 40	3.175	3.045	3.08
1/8 SM 44	3.175	3.055	3.09
9/64 SM 40	3.572	3.442	3.47
11/64 SM 40	4.366	4.236	4.27
3/16 SM 24	4.762	4.602	4.64
3/16 SM 28	4.762	4.602	4.64
3/16 SM 32	4.762	4.602	4.64
7/32 SM 32	5.556	5.396	5.44
15/64 SM 28	5.953	5.773	5.82
1/4 SM 24	6.350	6.170	6.22
1/4 SM 40	6.350	6.220	6.25

· from table 2 JIS B 0226 (void in 2001)

■ Taper pipe threads (PT, R)

Unit : mm

Size	bar diameter (ref.)	
	taper (dia of thread end)	Straight
PT 1/16 - 28	7.5	7.9
PT 1/8 - 28	9.5	9.9
PT 1/4 - 19	12.8	13.4
PT 3/8 - 19	16.3	16.9
PT 1/2 - 14	20.5	21.3
PT 3/4 - 14	25.9	26.8
PT 1 - 11	32.7	33.7
PT 1 1/4 - 11	41.2	42.3
PT 1 1/2 - 11	47.1	48.2
PT 2 - 11	58.7	60.1

■ Parallel pipe threads (PF · G)(for A class)

Unit : mm

Size	major diameter of external threads		bar diameter (ref.)
	$d_{\max}$	$d_{\min}$	
PF 1/16 - 28	7.723	7.509	7.56
PF 1/8 - 28	9.728	9.514	9.57
PF 1/4 - 19	13.157	12.907	13.0
PF 3/8 - 19	16.662	16.412	16.5
PF 1/2 - 14	20.955	20.671	20.7
PF 5/8 - 14	22.911	22.627	22.7
PF 3/4 - 14	26.441	26.157	26.2
PF 7/8 - 14	30.201	29.917	30.0
PF 1 - 11	33.249	32.889	33.0
PF 1 1/8 - 11	37.897	37.537	37.6
PF 1 1/4 - 11	41.910	41.550	41.6
PF 1 1/2 - 11	47.803	47.443	47.5
PF 2 - 11	59.614	59.254	59.3