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Limits of sizes and tolerances for metric fine screw threads

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Descriptors : ISO metric threads, tolerances (measurement), dimensional tolerances,
threads

Reference number : JIS B 0211 : 1997 (E)

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Foreword

This translation has been made based on the original Japanese Industrial Standard revised by the Minister of International Trade and Industry through deliberations at Japanese Industrial Standards Committee in accordance with the Industrial Standardization Law. Consequently, this revision replaces the former JIS B 0211:1982.

JIS B 0211 was revised in 1982 in order to conform to provision of ISO standards. In the revision, the body of the standard was described on the basis of ISO standards. Additionally, Appendix specified the limits of sizes and tolerances for Quality 1, Quality 2 and Quality 3 for M 1 × 0.2 to M 300 × 4 in designation of screw threads which had not been contained in ISO standards, with remarks "The qualities specified in this Appendix are to be withdrawn in future. Therefore, these qualities are to be transferred to tolerance class specified in the body."

After that revision, 15 years has passed and those screw threads have virtually been deleted from majority of Japanese Industrial Standards related to threaded fasteners.

In the revision at this time, the existing Appendix is withdrawn in order to enhance the transparency on the international conformity.

Date of Establishment: 1953-12-19

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Investigated by: Japanese Industrial Standards Committee

Divisional Council on Machine Elements

Technical Committee on Screw Threads

Basic

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In the event of any doubts arising as to the contents,
the original JIS is to be the final authority.

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Limits of sizes and tolerances for metric fine screw threads

Introduction This Japanese Industrial Standard has been made on the basis of **ISO 965-1**, *ISO general purpose metric screw threads—Tolerances—Part 1: Principles and basic data* published as 2nd edition in 1980, **ISO 965-2**, *ISO general purpose metric screw threads—Tolerances—Part 2: Limits of sizes for general purpose bolt and nut threads—Medium quality* published as 2nd edition in 1980, and **ISO 965-3**, *ISO general purpose metric screw threads—Tolerances—Part 3: Deviations for constructional threads* published as 2nd edition in 1980, without any modification in technical content with respect to the parts corresponding to limits of sizes and tolerances for metric fine screw threads of this Standard.

1 Scope This Japanese Industrial Standard specifies the limits of sizes and tolerances for metric fine screw threads (¹) specified in **JIS B 0207** to be used mainly for fastening.

Note (¹) The fine screw threads excluding M 14×1.25.

The limits of sizes and tolerances for this screw thread of M 14×1.25 shall be in accordance with **JIS B 8031** and **JIS W 4501**.

Remarks: The International Standards corresponding to this Standard are given below.

ISO 965-1:1980 *ISO general purpose metric screw threads—Tolerances—Part 1: Principles and basic data*

ISO 965-2:1980 *ISO general purpose metric screw threads—Tolerances—Part 2: Limits of sizes for general purpose bolt and nut threads—Medium quality*

ISO 965-3:1980 *ISO general purpose metric screw threads—Tolerances—Part 3: Deviations for constructional threads*

2 Normative references The following standards contain provisions which, through reference in this Standard, constitute part of provisions of this Standard. Normative references described on the most recent edition shall be applied.

JIS B 0123 *Designation of screw threads*

JIS B 0207 *Metric fine screw threads*

JIS B 0215 *Tolerance system for metric screw threads*

JIS B 0252 *Limit gauges for metric fine screw threads*

JIS B 1051 *Mechanical properties of steel bolts and screws*

JIS B 8031 *Spark plugs for internal combustion engines*

JIS W 4501 *Spark plugs for aircraft piston engines*

3 Relations of basic profiles, basic dimensions, limits of sizes, tolerances and fundamental deviations The relations of basic profiles, basic dimensions, limits of sizes, tolerances and fundamental deviations are shown in Fig. 1.

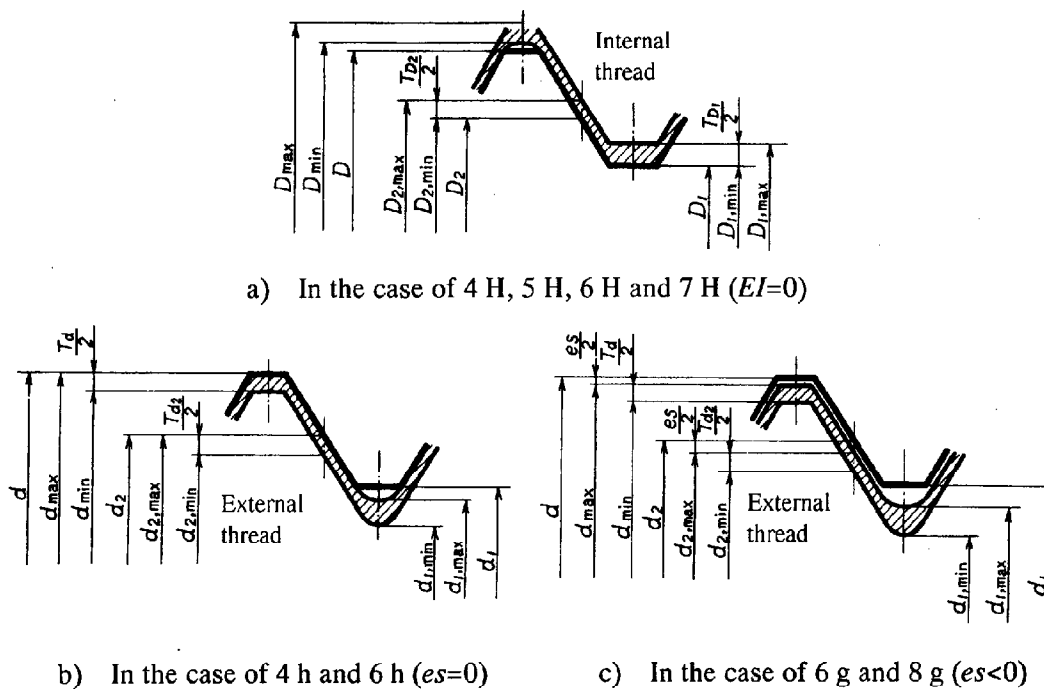


Fig. 1 Figure of relations of basic profiles, basic dimensions, limits of sizes, tolerances, and fundamental deviations for metric fine screw threads

The meaning of symbols in Fig. 1 is as follows:

- $D, D_{\max}$ and $D_{\min}$: basic dimension, maximum and minimum permissible dimensions of major diameter of internal thread.
- $D_2, D_{2,\max}, D_{2,\min}, T_{D_2}$ and EI : basic dimension, maximum and minimum permissible dimensions, tolerance and fundamental deviation of pitch diameter of internal thread.
- $D_1, D_{1,\max}, D_{1,\min}, T_{D_1}$ and EI : basic dimension, maximum and minimum permissible dimensions, tolerance and fundamental deviation of minor diameter of internal thread.
- $d, d_{\max}, d_{\min}, T_d$ and es : basic dimension, maximum and minimum permissible dimensions, tolerance and fundamental deviation of major diameter of external thread.
- $d_2, d_{2,\max}, d_{2,\min}, T_{d_2}$ and es : basic dimension, maximum and minimum permissible dimensions, tolerance and fundamental deviation of pitch diameter of external thread.
- $d_1, d_{1,\max}$ and $d_{1,\min}$: basic dimension, maximum and minimum permissible dimensions of minor diameter of external thread.

The bold continuous lines show the basic profile, and the oblique-lined portion shows permissible range of internal or external thread.

The numerical values of D , D_2 , D_1 , d , d_2 and d_1 are specified in Table 4 of **JIS B 0207**.

4 Fitting qualities, tolerance classes, limits of sizes, and tolerances of screw threads

The fitting qualities shall be divided into fine, medium, and coarse, and the corresponding tolerance classes shall be as shown in Table 1. The limits of sizes and tolerances shall be in accordance with Attached Table 1 to Attached Table 6, according to the division in Table 1.

The tolerance classes, limits of sizes and tolerances in Attached Table 1 to Attached Table 6 are shown referring to thread engagement group N specified in **JIS B 0215**, however, in the case of S whose length of thread engagement is shorter and in the case of L whose length of thread engagement is longer than that of N, those shall be in accordance with **JIS B 0215**.

Further, independent of fitting quality, the combination of internal and external threads of different class may be used, as required.

Table 1 Fitting qualities and corresponding tolerance classes of screw threads

Fitting quality (Example of application)	Division into internal or external thread	Tolerance class ⁽²⁾	Applicable Table
Fine Example of application: Fine screw thread with particularly small clearance.	Internal thread	4 H (M 1.8 × 0.2 max.) 5 H (M 2 × 0.25 min.)	Attached Table 1
	External thread	4 h	Attached Table 2
Medium Example of application: General purpose screw thread to be used for machines, devices and constructions.	Internal thread	6 H	Attached Table 3
	External thread	6 h (M 1.4 × 0.2 max.) 6 g (M 1.6 × 0.2 min.)	Attached Table 4
Coarse Example of application: Screw threads to be used under circumstances easily to be stained or damaged such as in building works, installation, or the like, and screw threads which are difficult in threading work such as in thread cutting the hot-rolled bar or in threading in the long blind hole.	Internal thread	7 H	Attached Table 5
	External thread	8 g	Attached Table 6

Note ⁽²⁾ Designation of tolerance class shall be in accordance with **JIS B 0215**.

Remarks 1 Fine, medium and coarse of fitting quality in Table 1 correspond to tolerance quality of fine, medium, and coarse in **ISO 965-1**, and the tolerance classes referring to fitting quality are selected from the recommended tolerance classes specified in **ISO 965-1**.

2 S, N, and L of length of engagement coincide with S, N, and L in thread engagement groups specified in **ISO 965-1**.

4

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5 Designation The designation of screw thread including tolerance class according to this Standard shall be in accordance with **JIS B 0123**.

Example: $M 6 \times 0.75 - 6 H$

$M 6 \times 0.75 - 6 g$

6 Limits after surface treatment The limits of sizes specified in this Standard apply to the parts, as a rule, before surface treatment. Dimensions after surface treatment (excluding hot-dipped galvanizing) shall not exceed the minimum limit at tolerance position H [refer to **a**) of Fig. 1] or the maximum limit at tolerance position h [refer to **b**) of Fig. 1].

7 Inspection The inspection on screw threads manufactured according to this Standard shall, as a rule, be carried out by means of a limit gauge for screw threads specified in **JIS B 0252**. However, in the case where the external threads of tolerance class of 6 g or 8 g are surface-treated by electroplating or the like, the GO ring thread gauge for 4 h or 6 h shall, as a rule, be used.

Related standard:

JIS Z 8401 *Rules for rounding off of numerical values*

Attached Table 1 Limits of sizes and tolerances for metric fine screw threads
(for internal threads)

Fitting quality : Fine

Tolerance class : 4 H (M 1.8×0.2 max.)

5 H (M 2×0.25 min.)

Unit: mm

Designation of screw thread	Tolerance class	Fundamental deviation <i>EI</i>	Major diameter		Pitch diameter			Minor diameter			Length of engagement (*)	
			<i>D</i> _{max}	<i>D</i> _{min}	<i>D</i> _{2,max}	<i>D</i> _{2,min}	<i>T</i> _{D2}	<i>D</i> _{1,max}	<i>D</i> _{1,min}	<i>T</i> _{D1}	Exceeding	Max.
M 1 ×0.2	4 H	0	Not specified	Not specified (*)	0.910	0.870	0.040	0.821	0.783	0.038	0.5	1.4
M 1.1×0.2					1.010	0.970	0.040	0.921	0.883	0.038	0.5	1.4
M 1.2×0.2					1.110	1.070	0.040	1.021	0.983	0.038	0.5	1.4
M 1.4×0.2					1.310	1.270	0.040	1.221	1.183	0.038	0.5	1.4
M 1.6×0.2					1.512	1.470	0.042	1.421	1.383	0.038	0.5	1.5
M 1.8×0.2					1.712	1.670	0.042	1.621	1.583	0.038	0.5	1.5
M 2 ×0.25	5 H	0			1.898	1.838	0.060	1.785	1.729	0.056	0.6	1.9
M 2.2×0.25					2.098	2.038	0.060	1.985	1.929	0.056	0.6	1.9
M 2.5×0.35					2.340	2.273	0.067	2.201	2.121	0.080	0.8	2.6
M 3 ×0.35					2.844	2.773	0.071	2.701	2.621	0.080	1	3
M 3.5×0.35					3.344	3.273	0.071	3.201	3.121	0.080	1	3
M 4 ×0.5					3.755	3.675	0.080	3.571	3.459	0.112	1.5	4.5
M 4.5×0.5					4.255	4.175	0.080	4.071	3.959	0.112	1.5	4.5
M 5 ×0.5					4.755	4.675	0.080	4.571	4.459	0.112	1.5	4.5
M 5.5×0.5					5.255	5.175	0.080	5.071	4.959	0.112	1.5	4.5
M 6 ×0.75					5.619	5.513	0.106	5.338	5.188	0.150	2.4	7.1
M 7 ×0.75					6.619	6.513	0.106	6.338	6.188	0.150	2.4	7.1
M 8 ×1					7.468	7.350	0.118	7.107	6.917	0.190	3	9
M 8 ×0.75					7.619	7.513	0.106	7.338	7.188	0.150	2.4	7.1
M 9 ×1					8.468	8.350	0.118	8.107	7.917	0.190	3	9
M 9 ×0.75					8.619	8.513	0.106	8.338	8.188	0.150	2.4	7.1
M 10 ×1.25					9.313	9.188	0.125	8.859	8.647	0.212	4	12
M 10 ×1					9.468	9.350	0.118	9.107	8.917	0.190	3	9
M 10 ×0.75					9.619	9.513	0.106	9.338	9.188	0.150	2.4	7.1
M 11 ×1					10.468	10.350	0.118	10.107	9.917	0.190	3	9
M 11 ×0.75					10.619	10.513	0.106	10.338	10.188	0.150	2.4	7.1
M 12 ×1.5					11.176	11.026	0.150	10.612	10.376	0.236	5.6	16
M 12 ×1.25					11.328	11.188	0.140	10.859	10.647	0.212	4.5	13
M 12 ×1					11.475	11.350	0.125	11.107	10.917	0.190	3.8	11
M 14 ×1.5					13.176	13.026	0.150	12.612	12.376	0.236	5.6	16
M 14 ×1					13.475	13.350	0.125	13.107	12.917	0.190	3.8	11
M 15 ×1.5					14.176	14.026	0.150	13.612	13.376	0.236	5.6	16
M 15 ×1					14.475	14.350	0.125	14.107	13.917	0.190	3.8	11
M 16 ×1.5					15.176	15.026	0.150	14.612	14.376	0.236	5.6	16
M 16 ×1					15.475	15.350	0.125	15.107	14.917	0.190	3.8	11
M 17 ×1.5					16.176	16.026	0.150	15.612	15.376	0.236	5.6	16
M 17 ×1					16.475	16.350	0.125	16.107	15.917	0.190	3.8	11
M 18 ×2					16.871	16.701	0.170	16.135	15.835	0.300	8	24
M 18 ×1.5					17.176	17.026	0.150	16.612	16.376	0.236	5.6	16
M 18 ×1					17.475	17.350	0.125	17.107	16.917	0.190	3.8	11
M 20 ×2					18.871	18.701	0.170	18.135	17.835	0.300	8	24
M 20 ×1.5					19.176	19.026	0.150	18.612	18.376	0.236	5.6	16

Attached Table 1 (continued)

Fitting quality : Fine

Tolerance class: 4 H (M 1.8×0.2 max.)

5 H (M 2×0.25 min.)

Unit: mm

Designation of screw thread	Tolerance class	Fundamental deviation <i>EI</i>	Major diameter		Pitch diameter			Minor diameter			Length of engagement (°)	
			<i>D</i> _{max}	<i>D</i> _{min}	<i>D</i> _{2,max}	<i>D</i> _{2,min}	<i>T</i> _{D2}	<i>D</i> _{1,max}	<i>D</i> _{1,min}	<i>T</i> _{D1}	Exceeding	Max.
M 20 ×1	5 H	0	Not specified	Not specified (°)	19.475	19.350	0.125	19.107	18.917	0.190	3.8	11
M 22 ×2					20.871	20.701	0.170	20.135	19.835	0.300	8	24
M 22 ×1.5					21.176	21.026	0.150	20.612	20.376	0.236	5.6	16
M 22 ×1					21.475	21.350	0.125	21.107	20.917	0.190	3.8	11
M 24 ×2					22.881	22.701	0.180	22.135	21.835	0.300	8.5	25
M 24 ×1.5					23.186	23.026	0.160	22.612	22.376	0.236	6.3	19
M 24 ×1					23.482	23.350	0.132	23.107	22.917	0.190	4	12
M 25 ×2					23.881	23.701	0.180	23.135	22.835	0.300	8.5	25
M 25 ×1.5					24.186	24.026	0.160	23.612	23.376	0.236	6.3	19
M 25 ×1					24.482	24.350	0.132	24.107	23.917	0.190	4	12
M 26 ×1.5					25.186	25.026	0.160	24.612	24.376	0.236	6.3	19
M 27 ×2					25.881	25.701	0.180	25.135	24.835	0.300	8.5	25
M 27 ×1.5					26.186	26.026	0.160	25.612	25.376	0.236	6.3	19
M 27 ×1					26.482	26.350	0.132	26.107	25.917	0.190	4	12
M 28 ×2					26.881	26.701	0.180	26.135	25.835	0.300	8.5	25
M 28 ×1.5					27.186	27.026	0.160	26.612	26.376	0.236	6.3	19
M 28 ×1					27.482	27.350	0.132	27.107	26.917	0.190	4	12
M 30 ×3					28.263	28.051	0.212	27.152	26.752	0.400	12	36
M 30 ×2					28.881	28.701	0.180	28.135	27.835	0.300	8.5	25
M 30 ×1.5					29.186	29.026	0.160	28.612	28.376	0.236	6.3	19
M 30 ×1					29.482	29.350	0.132	29.107	28.917	0.190	4	12
M 32 ×2					30.881	30.701	0.180	30.135	29.835	0.300	8.5	25
M 32 ×1.5					31.186	31.026	0.160	30.612	30.376	0.236	6.3	19
M 33 ×3					31.263	31.051	0.212	30.152	29.752	0.400	12	36
M 33 ×2					31.881	31.701	0.180	31.135	30.835	0.300	8.5	25
M 33 ×1.5					32.186	32.026	0.160	31.612	31.376	0.236	6.3	19
M 35 ×1.5					34.186	34.026	0.160	33.612	33.376	0.236	6.3	19
M 36 ×3					34.263	34.051	0.212	33.152	32.752	0.400	12	36
M 36 ×2					34.881	34.701	0.180	34.135	33.835	0.300	8.5	25
M 36 ×1.5					35.186	35.026	0.160	34.612	34.376	0.236	6.3	19
M 38 ×1.5					37.186	37.026	0.160	36.612	36.376	0.236	6.3	19
M 39 ×3					37.263	37.051	0.212	36.152	35.752	0.400	12	36
M 39 ×2					37.881	37.701	0.180	37.135	36.835	0.300	8.5	25
M 39 ×1.5					38.186	38.026	0.160	37.612	37.376	0.236	6.3	19
M 40 ×3					38.263	38.051	0.212	37.152	36.752	0.400	12	36
M 40 ×2					38.881	38.701	0.180	38.135	37.835	0.300	8.5	25
M 40 ×1.5					39.186	39.026	0.160	38.612	38.376	0.236	6.3	19
M 42 ×4					39.638	39.402	0.236	38.145	37.670	0.475	18	53
M 42 ×3					40.263	40.051	0.212	39.152	38.752	0.400	12	36
M 42 ×2					40.881	40.701	0.180	40.135	39.835	0.300	8.5	25
M 42 ×1.5					41.186	41.026	0.160	40.612	40.376	0.236	6.3	19
M 45 ×4					42.638	42.402	0.236	41.145	40.670	0.475	18	53

Attached Table 1 (continued)
 Fitting quality : Fine
 Tolerance class: 4 H (M 1.8×0.2 max.)
 5 H (M 2×0.25 min.)

Unit: mm

Designation of screw thread	Tolerance class	Fundamental deviation <i>EI</i>	Major diameter		Pitch diameter			Minor diameter			Length of engagement (°)	
			<i>D</i> _{max}	<i>D</i> _{min}	<i>D</i> _{2,max}	<i>D</i> _{2,min}	<i>T</i> _{D2}	<i>D</i> _{1,max}	<i>D</i> _{1,min}	<i>T</i> _{D1}	Exceeding	Max.
M 45 × 3	5 H	0	Not specified	Not specified (°)	43.263	43.051	0.212	42.152	41.752	0.400	12	36
M 45 × 2					43.881	43.701	0.180	43.135	42.835	0.300	8.5	25
M 45 × 1.5					44.186	44.026	0.160	43.612	43.376	0.236	6.3	19
M 48 × 4					45.652	45.402	0.250	44.145	43.670	0.475	19	56
M 48 × 3					46.275	46.051	0.224	45.152	44.752	0.400	15	45
M 48 × 2					46.891	46.701	0.190	46.135	45.835	0.300	9.5	28
M 48 × 1.5					47.196	47.026	0.170	46.612	46.376	0.236	7.5	22
M 50 × 3					48.275	48.051	0.224	47.152	46.752	0.400	15	45
M 50 × 2					48.891	48.701	0.190	48.135	47.835	0.300	9.5	28
M 50 × 1.5					49.196	49.026	0.170	48.612	48.376	0.236	7.5	22
M 52 × 4					49.652	49.402	0.250	48.145	47.670	0.475	19	56
M 52 × 3					50.275	50.051	0.224	49.152	48.752	0.400	15	45
M 52 × 2					50.891	50.701	0.190	50.135	49.835	0.300	9.5	28
M 52 × 1.5					51.196	51.026	0.170	50.612	50.376	0.236	7.5	22
M 55 × 4					52.652	52.402	0.250	51.145	50.670	0.475	19	56
M 55 × 3					53.275	53.051	0.224	52.152	51.752	0.400	15	45
M 55 × 2					53.891	53.701	0.190	53.135	52.835	0.300	9.5	28
M 55 × 1.5					54.196	54.026	0.170	53.612	53.376	0.236	7.5	22
M 56 × 4					53.652	53.402	0.250	52.145	51.670	0.475	19	56
M 56 × 3					54.275	54.051	0.224	53.152	52.752	0.400	15	45
M 56 × 2					54.891	54.701	0.190	54.135	53.835	0.300	9.5	28
M 56 × 1.5					55.196	55.026	0.170	54.612	54.376	0.236	7.5	22
M 58 × 4					55.652	55.402	0.250	54.145	53.670	0.475	19	56
M 58 × 3					56.275	56.051	0.224	55.152	54.752	0.400	15	45
M 58 × 2					56.891	56.701	0.190	56.135	55.835	0.300	9.5	28
M 58 × 1.5					57.196	57.026	0.170	56.612	56.376	0.236	7.5	22
M 60 × 4					57.652	57.402	0.250	56.145	55.670	0.475	19	56
M 60 × 3					58.275	58.051	0.224	57.152	56.752	0.400	15	45
M 60 × 2					58.891	58.701	0.190	58.135	57.835	0.300	9.5	28
M 60 × 1.5					59.196	59.026	0.170	58.612	58.376	0.236	7.5	22
M 62 × 4					59.652	59.402	0.250	58.145	57.670	0.475	19	56
M 62 × 3					60.275	60.051	0.224	59.152	58.752	0.400	15	45
M 62 × 2					60.891	60.701	0.190	60.135	59.835	0.300	9.5	28
M 62 × 1.5					61.196	61.026	0.170	60.612	60.376	0.236	7.5	22
M 64 × 4					61.652	61.402	0.250	60.145	59.670	0.475	19	56
M 64 × 3					62.275	62.051	0.224	61.152	60.752	0.400	15	45
M 64 × 2					62.891	62.701	0.190	62.135	61.835	0.300	9.5	28
M 64 × 1.5					63.196	63.026	0.170	62.612	62.376	0.236	7.5	22
M 65 × 4					62.652	62.402	0.250	61.145	60.670	0.475	19	56
M 65 × 3					63.275	63.051	0.224	62.152	61.752	0.400	15	45
M 65 × 2					63.891	63.701	0.190	63.135	62.835	0.300	9.5	28
M 65 × 1.5					64.196	64.026	0.170	63.612	63.376	0.236	7.5	22

Attached Table 1 (continued)

Fitting quality : Fine

Tolerance class: 4 H (M 1.8×0.2 max.)

5 H (M 2×0.25 min.)

Unit: mm

Designation of screw thread	Tolerance class	Fundamental deviation <i>EI</i>	Major diameter		Pitch diameter			Minor diameter			Length of engagement (°)	
			<i>D</i> _{max}	<i>D</i> _{min}	<i>D</i> _{2,max}	<i>D</i> _{2,min}	<i>T</i> _{D2}	<i>D</i> _{1,max}	<i>D</i> _{1,min}	<i>T</i> _{D1}	Exceeding	Max.
M 68 ×4	5 H	0	Not specified	Not specified (°)	65.652	65.402	0.250	64.145	63.670	0.475	19	56
M 68 ×3					66.275	66.051	0.224	65.152	64.752	0.400	15	45
M 68 ×2					66.891	66.701	0.190	66.135	65.835	0.300	9.5	28
M 68 ×1.5					67.196	67.026	0.170	66.612	66.376	0.236	7.5	22
M 70 ×6					66.403	66.103	0.300	64.135	63.505	0.630	32	95
M 70 ×4					67.652	67.402	0.250	66.145	65.670	0.475	19	56
M 70 ×3					68.275	68.051	0.224	67.152	66.752	0.400	15	45
M 70 ×2					68.891	68.701	0.190	68.135	67.835	0.300	9.5	28
M 70 ×1.5					69.196	69.026	0.170	68.612	68.376	0.236	7.5	22
M 72 ×6					68.403	68.103	0.300	66.135	65.505	0.630	32	95
M 72 ×4					69.652	69.402	0.250	68.145	67.670	0.475	19	56
M 72 ×3					70.275	70.051	0.224	69.152	68.752	0.400	15	45
M 72 ×2					70.891	70.701	0.190	70.135	69.835	0.300	9.5	28
M 72 ×1.5					71.196	71.026	0.170	70.612	70.376	0.236	7.5	22
M 75 ×4					72.652	72.402	0.250	71.145	70.670	0.475	19	56
M 75 ×3					73.275	73.051	0.224	72.152	71.752	0.400	15	45
M 75 ×2					73.891	73.701	0.190	73.135	72.835	0.300	9.5	28
M 75 ×1.5					74.196	74.026	0.170	73.612	73.376	0.236	7.5	22
M 76 ×6					72.403	72.103	0.300	70.135	69.505	0.630	32	95
M 76 ×4					73.652	73.402	0.250	72.145	71.670	0.475	19	56
M 76 ×3					74.275	74.051	0.224	73.152	72.752	0.400	15	45
M 76 ×2					74.891	74.701	0.190	74.135	73.835	0.300	9.5	28
M 76 ×1.5					75.196	75.026	0.170	74.612	74.376	0.236	7.5	22
M 78 ×2					76.891	76.701	0.190	76.135	75.835	0.300	9.5	28
M 80 ×6					76.403	76.103	0.300	74.135	73.505	0.630	32	95
M 80 ×4					77.652	77.402	0.250	76.145	75.670	0.475	19	56
M 80 ×3					78.275	78.051	0.224	77.152	76.752	0.400	15	45
M 80 ×2					78.891	78.701	0.190	78.135	77.835	0.300	9.5	28
M 80 ×1.5					79.196	79.026	0.170	78.612	78.376	0.236	7.5	22
M 82 ×2					80.891	80.701	0.190	80.135	79.835	0.300	9.5	28
M 85 ×6					81.403	81.103	0.300	79.135	78.505	0.630	32	95
M 85 ×4					82.652	82.402	0.250	81.145	80.670	0.475	19	56
M 85 ×3					83.275	83.051	0.224	82.152	81.752	0.400	15	45
M 85 ×2					83.891	83.701	0.190	83.135	82.835	0.300	9.5	28
M 90 ×6					86.403	86.103	0.300	84.135	83.505	0.630	32	95
M 90 ×4					87.652	87.402	0.250	86.145	85.670	0.475	19	56
M 90 ×3					88.275	88.051	0.224	87.152	86.752	0.400	15	45
M 90 ×2					88.891	88.701	0.190	88.135	87.835	0.300	9.5	28
M 95 ×6					91.418	91.103	0.315	89.135	88.505	0.630	36	106
M 95 ×4					92.667	92.402	0.265	91.145	90.670	0.475	24	71
M 95 ×3					93.287	93.051	0.236	92.152	91.752	0.400	18	53
M 95 ×2					93.901	93.701	0.200	93.135	92.835	0.300	12	36

Attached Table 1 (continued)
 Fitting quality : Fine
 Tolerance class: 4 H (M 1.8×0.2 max.)
 5 H (M 2×0.25 min.)

Unit: mm

Designation of screw thread	Tolerance class	Fundamental deviation <i>EI</i>	Major diameter		Pitch diameter			Minor diameter			Length of engagement (°)	
			<i>D</i> _{max}	<i>D</i> _{min}	<i>D</i> _{2,max}	<i>D</i> _{2,min}	<i>T</i> ₀₂	<i>D</i> _{1,max}	<i>D</i> _{1,min}	<i>T</i> ₀₁	Exceeding	Max.
M 100 × 6	5 H	0	Not specified	Not specified (°)	96.418	96.103	0.315	94.135	93.505	0.630	36	106
M 100 × 4					97.667	97.402	0.265	96.145	95.670	0.475	24	71
M 100 × 3					98.287	98.051	0.236	97.152	96.752	0.400	18	53
M 100 × 2					98.901	98.701	0.200	98.135	97.835	0.300	12	36
M 105 × 6					101.418	101.103	0.315	99.135	98.505	0.630	36	106
M 105 × 4					102.667	102.402	0.265	101.145	100.670	0.475	24	71
M 105 × 3					103.287	103.051	0.236	102.152	101.752	0.400	18	53
M 105 × 2					103.901	103.701	0.200	103.135	102.835	0.300	12	36
M 110 × 6					106.418	106.103	0.315	104.135	103.505	0.630	36	106
M 110 × 4					107.667	107.402	0.265	106.145	105.670	0.475	24	71
M 110 × 3					108.287	108.051	0.236	107.152	106.752	0.400	18	53
M 110 × 2					108.901	108.701	0.200	108.135	107.835	0.300	12	36
M 115 × 6					111.418	111.103	0.315	109.135	108.505	0.630	36	106
M 115 × 4					112.667	112.402	0.265	111.145	110.670	0.475	24	71
M 115 × 3					113.287	113.051	0.236	112.152	111.752	0.400	18	53
M 115 × 2					113.901	113.701	0.200	113.135	112.835	0.300	12	36
M 120 × 6					116.418	116.103	0.315	114.135	113.505	0.630	36	106
M 120 × 4					117.667	117.402	0.265	116.145	115.670	0.475	24	71
M 120 × 3					118.287	118.051	0.236	117.152	116.752	0.400	18	53
M 120 × 2					118.901	118.701	0.200	118.135	117.835	0.300	12	36
M 125 × 6					121.418	121.103	0.315	119.135	118.505	0.630	36	106
M 125 × 4					122.667	122.402	0.265	121.145	120.670	0.475	24	71
M 125 × 3					123.287	123.051	0.236	122.152	121.752	0.400	18	53
M 125 × 2					123.901	123.701	0.200	123.135	122.835	0.300	12	36
M 130 × 6					126.418	126.103	0.315	124.135	123.505	0.630	36	106
M 130 × 4					127.667	127.402	0.265	126.145	125.670	0.475	24	71
M 130 × 3					128.287	128.051	0.236	127.152	126.752	0.400	18	53
M 130 × 2					128.901	128.701	0.200	128.135	127.835	0.300	12	36
M 135 × 6					131.418	131.103	0.315	129.135	128.505	0.630	36	106
M 135 × 4					132.667	132.402	0.265	131.145	130.670	0.475	24	71
M 135 × 3					133.287	133.051	0.236	132.152	131.752	0.400	18	53
M 135 × 2					133.901	133.701	0.200	133.135	132.835	0.300	12	36
M 140 × 6					136.418	136.103	0.315	134.135	133.505	0.630	36	106
M 140 × 4					137.667	137.402	0.265	136.145	135.670	0.475	24	71
M 140 × 3					138.287	138.051	0.236	137.152	136.752	0.400	18	53
M 140 × 2					138.901	138.701	0.200	138.135	137.835	0.300	12	36
M 145 × 6					141.418	141.103	0.315	139.135	138.505	0.630	36	106
M 145 × 4					142.667	142.402	0.265	141.145	140.670	0.475	24	71
M 145 × 3					143.287	143.051	0.236	142.152	141.752	0.400	18	53
M 145 × 2					143.901	143.701	0.200	143.135	142.835	0.300	12	36
M 150 × 6					146.418	146.103	0.315	144.135	143.505	0.630	36	106
M 150 × 4					147.667	147.402	0.265	146.145	145.670	0.475	24	71

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Attached Table 1 (continued)
Fitting quality : Fine
Tolerance class: 4 H (M 1.8×0.2 max.)
5 H (M 2×0.25 min.)

Unit: mm

Designation of screw thread	Tolerance class	Fundamental deviation <i>EI</i>	Major diameter		Pitch diameter			Minor diameter			Length of engagement (')	
			<i>D</i> _{max}	<i>D</i> _{min}	<i>D</i> _{2,max}	<i>D</i> _{2,min}	<i>T</i> _{D2}	<i>D</i> _{1,max}	<i>D</i> _{1,min}	<i>T</i> _{D1}	Exceeding	Max.
M 150 × 3	5 H	0	Not specified	Not specified (°)	148.287	148.051	0.236	147.152	146.752	0.400	18	53
M 150 × 2					148.901	148.701	0.200	148.135	147.835	0.300	12	36
M 155 × 6					151.418	151.103	0.315	149.135	148.505	0.630	36	106
M 155 × 4					152.667	152.402	0.265	151.145	150.670	0.475	24	71
M 155 × 3					153.287	153.051	0.236	152.152	151.752	0.400	18	53
M 160 × 6					156.418	156.103	0.315	154.135	153.505	0.630	36	106
M 160 × 4					157.667	157.402	0.265	156.145	155.670	0.475	24	71
M 160 × 3					158.287	158.051	0.236	157.152	156.752	0.400	18	53
M 165 × 6					161.418	161.103	0.315	159.135	158.505	0.630	36	106
M 165 × 4					162.667	162.402	0.265	161.145	160.670	0.475	24	71
M 165 × 3					163.287	163.051	0.236	162.152	161.752	0.400	18	53
M 170 × 6					166.418	166.103	0.315	164.135	163.505	0.630	36	106
M 170 × 4					167.667	167.402	0.265	166.145	165.670	0.475	24	71
M 170 × 3					168.287	168.051	0.236	167.152	166.752	0.400	18	53
M 175 × 6					171.418	171.103	0.315	169.135	168.505	0.630	36	106
M 175 × 4					172.667	172.402	0.265	171.145	170.670	0.475	24	71
M 175 × 3					173.287	173.051	0.236	172.152	171.752	0.400	18	53
M 180 × 6					176.418	176.103	0.315	174.135	173.505	0.630	36	106
M 180 × 4					177.667	177.402	0.265	176.145	175.670	0.475	24	71
M 180 × 3					178.287	178.051	0.236	177.152	176.752	0.400	18	53
M 185 × 6					181.438	181.103	0.335	179.135	178.505	0.630	40	118
M 185 × 4					182.702	182.402	0.300	181.145	180.670	0.475	26	80
M 185 × 3					183.316	183.051	0.265	182.152	181.752	0.400	20	60
M 190 × 6					186.438	186.103	0.335	184.135	183.505	0.630	40	118
M 190 × 4					187.702	187.402	0.300	186.145	185.670	0.475	26	80
M 190 × 3					188.316	188.051	0.265	187.152	186.752	0.400	20	60
M 195 × 6					191.438	191.103	0.335	189.135	188.505	0.630	40	118
M 195 × 4					192.702	192.402	0.300	191.145	190.670	0.475	26	80
M 195 × 3					193.316	193.051	0.265	192.152	191.752	0.400	20	60
M 200 × 6					196.438	196.103	0.335	194.135	193.505	0.630	40	118
M 200 × 4					197.702	197.402	0.300	196.145	195.670	0.475	26	80
M 200 × 3					198.316	198.051	0.265	197.152	196.752	0.400	20	60
M 205 × 6					201.438	201.103	0.335	199.135	198.505	0.630	40	118
M 205 × 4					202.702	202.402	0.300	201.145	200.670	0.475	26	80
M 205 × 3					203.316	203.051	0.265	202.152	201.752	0.400	20	60
M 210 × 6					206.438	206.103	0.335	204.135	203.505	0.630	40	118
M 210 × 4					207.702	207.402	0.300	206.145	205.670	0.475	26	80
M 210 × 3					208.316	208.051	0.265	207.152	206.752	0.400	20	60
M 215 × 6					211.438	211.103	0.335	209.135	208.505	0.630	40	118
M 215 × 4					212.702	212.402	0.300	211.145	210.670	0.475	26	80
M 215 × 3					213.316	213.051	0.265	212.152	211.752	0.400	20	60
M 220 × 6					216.438	216.103	0.335	214.135	213.505	0.630	40	118

Attached Table 1 (concluded)
 Fitting quality : Fine
 Tolerance class: 4 H (M 1.8×0.2 max.)
 5 H (M 2×0.25 min.)

Unit: mm

Designation of screw thread	Tolerance class	Fundamental deviation <i>EI</i>	Major diameter		Pitch diameter			Minor diameter			Length of engagement (°)	
			<i>D</i> _{max}	<i>D</i> _{min}	<i>D</i> _{2,max}	<i>D</i> _{2,min}	<i>T</i> _{D2}	<i>D</i> _{1,max}	<i>D</i> _{1,min}	<i>T</i> _{D1}	Exceeding	Max.
M 220 × 4	5 H	0	Not specified	Not specified (°)	217.702	217.402	0.300	216.145	215.670	0.475	26	80
M 220 × 3					218.316	218.051	0.265	217.152	216.752	0.400	20	60
M 225 × 6					221.438	221.103	0.335	219.135	218.505	0.630	40	118
M 225 × 4					222.702	222.402	0.300	221.145	220.670	0.475	26	80
M 225 × 3					223.316	223.051	0.265	222.152	221.752	0.400	20	60
M 230 × 6					226.438	226.103	0.335	224.135	223.505	0.630	40	118
M 230 × 4					227.702	227.402	0.300	226.145	225.670	0.475	26	80
M 230 × 3					228.316	228.051	0.265	227.152	226.752	0.400	20	60
M 235 × 6					231.438	231.103	0.335	229.135	228.505	0.630	40	118
M 235 × 4					232.702	232.402	0.300	231.145	230.670	0.475	26	80
M 235 × 3					233.316	233.051	0.265	232.152	231.752	0.400	20	60
M 240 × 6					236.438	236.103	0.335	234.135	233.505	0.630	40	118
M 240 × 4					237.702	237.402	0.300	236.145	235.670	0.475	26	80
M 240 × 3					238.316	238.051	0.265	237.152	236.752	0.400	20	60
M 245 × 6					241.438	241.103	0.335	239.135	238.505	0.630	40	118
M 245 × 4					242.702	242.402	0.300	241.145	240.670	0.475	26	80
M 245 × 3					243.316	243.051	0.265	242.152	241.752	0.400	20	60
M 250 × 6					246.438	246.103	0.335	244.135	243.505	0.630	40	118
M 250 × 4					247.702	247.402	0.300	246.145	245.670	0.475	26	80
M 250 × 3					248.316	248.051	0.265	247.152	246.752	0.400	20	60
M 255 × 6					251.438	251.103	0.335	249.135	248.505	0.630	40	118
M 255 × 4					252.702	252.402	0.300	251.145	250.670	0.475	26	80
M 260 × 6					256.438	256.103	0.335	254.135	253.505	0.630	40	118
M 260 × 4					257.702	257.402	0.300	256.145	255.670	0.475	26	80
M 265 × 6					261.438	261.103	0.335	259.135	258.505	0.630	40	118
M 265 × 4					262.702	262.402	0.300	261.145	260.670	0.475	26	80
M 270 × 6					266.438	266.103	0.335	264.135	263.505	0.630	40	118
M 270 × 4					267.702	267.402	0.300	266.145	265.670	0.475	26	80
M 275 × 6					271.438	271.103	0.335	269.135	268.505	0.630	40	118
M 275 × 4					272.702	272.402	0.300	271.145	270.670	0.475	26	80
M 280 × 6					276.438	276.103	0.335	274.135	273.505	0.630	40	118
M 280 × 4					277.702	277.402	0.300	276.145	275.670	0.475	26	80
M 285 × 6					281.438	281.103	0.335	279.135	278.505	0.630	40	118
M 285 × 4					282.702	282.402	0.300	281.145	280.670	0.475	26	80
M 290 × 6					286.438	286.103	0.335	284.135	283.505	0.630	40	118
M 290 × 4					287.702	287.402	0.300	286.145	285.670	0.475	26	80
M 295 × 6					291.438	291.103	0.335	289.135	288.505	0.630	40	118
M 295 × 4					292.702	292.402	0.300	291.145	290.670	0.475	26	80
M 300 × 6					296.438	296.103	0.335	294.135	293.505	0.630	40	118
M 300 × 4					297.702	297.402	0.300	296.145	295.670	0.475	26	80

Notes (°) The minimum permissible dimensions of the major diameter are not specified, but a more or less clearance shall, as a rule, be provided between the root and the basic profile.

(°) It coincides with the value of thread engagement group N specified in JIS B 0215.

Attached Table 2 Limits of sizes and tolerances for metric fine screw threads
(for external threads)

Fitting quality : Fine

Tolerance class : 4 h

Unit: mm

Designation of screw thread	Tolerance class	Fundamental deviation <i>es</i>	Major diameter			Pitch diameter			Minimum root radius ([°])	Length of engagement ([°])	
			<i>d_{max}</i>	<i>d_{min}</i>	<i>T_d</i>	<i>d_{2max}</i>	<i>d_{2min}</i>	<i>T_{d2}</i>		Exceeding	Max.
M 1 × 0.2	4 h	0	1.000	0.964	0.036	0.870	0.840	0.030	0.025	0.5	1.4
M 1.1 × 0.2			1.100	1.064	0.036	0.970	0.940	0.030	0.025	0.5	1.4
M 1.2 × 0.2			1.200	1.164	0.036	1.070	1.040	0.030	0.025	0.5	1.4
M 1.4 × 0.2			1.400	1.364	0.036	1.270	1.240	0.030	0.025	0.5	1.4
M 1.6 × 0.2			1.600	1.564	0.036	1.470	1.438	0.032	0.025	0.5	1.5
M 1.8 × 0.2			1.800	1.764	0.036	1.670	1.638	0.032	0.025	0.5	1.5
M 2.0 × 0.25			2.000	1.958	0.042	1.838	1.802	0.036	0.031	0.6	1.9
M 2.2 × 0.25			2.200	2.158	0.042	2.038	2.002	0.036	0.031	0.6	1.9
M 2.5 × 0.35			2.500	2.447	0.053	2.273	2.233	0.040	0.044	0.8	2.6
M 3 × 0.35			3.000	2.947	0.053	2.773	2.731	0.042	0.044	1	3
M 3.5 × 0.35			3.500	3.447	0.053	3.273	3.231	0.042	0.044	1	3
M 4 × 0.5			4.000	3.933	0.067	3.675	3.627	0.048	0.063	1.5	4.5
M 4.5 × 0.5			4.500	4.433	0.067	4.175	4.127	0.048	0.063	1.5	4.5
M 5 × 0.5			5.000	4.933	0.067	4.675	4.627	0.048	0.063	1.5	4.5
M 5.5 × 0.5			5.500	5.433	0.067	5.175	5.127	0.048	0.063	1.5	4.5
M 6 × 0.75			6.000	5.910	0.090	5.513	5.450	0.063	0.094	2.4	7.1
M 7 × 0.75			7.000	6.910	0.090	6.513	6.450	0.063	0.094	2.4	7.1
M 8 × 1			8.000	7.888	0.112	7.350	7.279	0.071	0.125	3	9
M 8 × 0.75			8.000	7.910	0.090	7.513	7.450	0.063	0.094	2.4	7.1
M 9 × 1			9.000	8.888	0.112	8.350	8.279	0.071	0.125	3	9
M 9 × 0.75			9.000	8.910	0.090	8.513	8.450	0.063	0.094	2.4	7.1
M 10 × 1.25			10.000	9.868	0.132	9.188	9.113	0.075	0.156	4	12
M 10 × 1			10.000	9.888	0.112	9.350	9.279	0.071	0.125	3	9
M 10 × 0.75			10.000	9.910	0.090	9.513	9.450	0.063	0.094	2.4	7.1
M 11 × 1			11.000	10.888	0.112	10.350	10.279	0.071	0.125	3	9
M 11 × 0.75			11.000	10.910	0.090	10.513	10.450	0.063	0.094	2.4	7.1
M 12 × 1.5			12.000	11.850	0.150	11.026	10.936	0.090	0.188	5.6	16
M 12 × 1.25			12.000	11.868	0.132	11.188	11.103	0.085	0.156	4.5	13
M 12 × 1			12.000	11.888	0.112	11.350	11.275	0.075	0.125	3.8	11
M 14 × 1.5			14.000	13.850	0.150	13.026	12.936	0.090	0.188	5.6	16
M 14 × 1			14.000	13.888	0.112	13.350	13.275	0.075	0.125	3.8	11
M 15 × 1.5			15.000	14.850	0.150	14.026	13.936	0.090	0.188	5.6	16
M 15 × 1			15.000	14.888	0.112	14.350	14.275	0.075	0.125	3.8	11
M 16 × 1.5			16.000	15.850	0.150	15.026	14.936	0.090	0.188	5.6	16
M 16 × 1			16.000	15.888	0.112	15.350	15.275	0.075	0.125	3.8	11
M 17 × 1.5			17.000	16.850	0.150	16.026	15.936	0.090	0.188	5.6	16
M 17 × 1			17.000	16.888	0.112	16.350	16.275	0.075	0.125	3.8	11
M 18 × 2			18.000	17.820	0.180	16.701	16.601	0.100	0.250	8	24
M 18 × 1.5			18.000	17.850	0.150	17.026	16.936	0.090	0.188	5.6	16
M 18 × 1			18.000	17.888	0.112	17.350	17.275	0.075	0.125	3.8	11
M 20 × 2			20.000	19.820	0.180	18.701	18.601	0.100	0.250	8	24
M 20 × 1.5			20.000	19.850	0.150	19.026	18.936	0.090	0.188	5.6	16

Attached Table 2 (continued)

Fitting quality : Fine

Tolerance class : 4 h

Unit: mm

Designation of screw thread	Tolerance class	Fundamental deviation <i>es</i>	Major diameter			Pitch diameter			Minimum root radius (⁵) <i>R_{min}</i>	Length of engagement (⁴)	
			<i>d_{max}</i>	<i>d_{min}</i>	<i>T_d</i>	<i>d_{2,max}</i>	<i>d_{2,min}</i>	<i>T_{d2}</i>		Exceeding	Max.
M 20 × 1	4 h	0	20.000	19.888	0.112	19.350	19.275	0.075	0.125	3.8	11
M 22 × 2			22.000	21.820	0.180	20.701	20.601	0.100	0.250	8	24
M 22 × 1.5			22.000	21.850	0.150	21.026	20.936	0.090	0.188	5.6	16
M 22 × 1			22.000	21.888	0.112	21.350	21.275	0.075	0.125	3.8	11
M 24 × 2			24.000	23.820	0.180	22.701	22.595	0.106	0.250	8.5	25
M 24 × 1.5			24.000	23.850	0.150	23.026	22.931	0.095	0.188	6.3	19
M 24 × 1			24.000	23.888	0.112	23.350	23.270	0.080	0.125	4	12
M 25 × 2			25.000	24.820	0.180	23.701	23.595	0.106	0.250	8.5	25
M 25 × 1.5			25.000	24.850	0.150	24.026	23.931	0.095	0.188	6.3	19
M 25 × 1			25.000	24.888	0.112	24.350	24.270	0.080	0.125	4	12
M 26 × 1.5			26.000	25.850	0.150	25.026	24.931	0.095	0.188	6.3	19
M 27 × 2			27.000	26.820	0.180	25.701	25.595	0.106	0.250	8.5	25
M 27 × 1.5			27.000	26.850	0.150	26.026	25.931	0.095	0.188	6.3	19
M 27 × 1			27.000	26.888	0.112	26.350	26.270	0.080	0.125	4	12
M 28 × 2			28.000	27.820	0.180	26.701	26.595	0.106	0.250	8.5	25
M 28 × 1.5			28.000	27.850	0.150	27.026	26.931	0.095	0.188	6.3	19
M 28 × 1			28.000	27.888	0.112	27.350	27.270	0.080	0.125	4	12
M 30 × 3			30.000	29.764	0.236	28.051	27.926	0.125	0.375	12	36
M 30 × 2			30.000	29.820	0.180	28.701	28.595	0.106	0.250	8.5	25
M 30 × 1.5			30.000	29.850	0.150	29.026	28.931	0.095	0.188	6.3	19
M 30 × 1			30.000	29.888	0.112	29.350	29.270	0.080	0.125	4	12
M 32 × 2			32.000	31.820	0.180	30.701	30.595	0.106	0.250	8.5	25
M 32 × 1.5			32.000	31.850	0.150	31.026	30.931	0.095	0.188	6.3	19
M 33 × 3			33.000	32.764	0.236	31.051	30.926	0.125	0.375	12	36
M 33 × 2			33.000	32.820	0.180	31.701	31.595	0.106	0.250	8.5	25
M 33 × 1.5			33.000	32.850	0.150	32.026	31.931	0.095	0.188	6.3	19
M 35 × 1.5			35.000	34.850	0.150	34.026	33.931	0.095	0.188	6.3	19
M 36 × 3			36.000	35.764	0.236	34.051	33.926	0.125	0.375	12	36
M 36 × 2			36.000	35.820	0.180	34.701	34.595	0.106	0.250	8.5	25
M 36 × 1.5			36.000	35.850	0.150	35.026	34.931	0.095	0.188	6.3	19
M 38 × 1.5			38.000	37.850	0.150	37.026	36.931	0.095	0.188	6.3	19
M 39 × 3			39.000	38.764	0.236	37.051	36.926	0.125	0.375	12	36
M 39 × 2			39.000	38.820	0.180	37.701	37.595	0.106	0.250	8.5	25
M 39 × 1.5			39.000	38.850	0.150	38.026	37.931	0.095	0.188	6.3	19
M 40 × 3			40.000	39.764	0.236	38.051	37.926	0.125	0.375	12	36
M 40 × 2			40.000	39.820	0.180	38.701	38.595	0.106	0.250	8.5	25
M 40 × 1.5			40.000	39.850	0.150	39.026	38.931	0.095	0.188	6.3	19
M 42 × 4			42.000	41.700	0.300	39.402	39.262	0.140	0.500	18	53
M 42 × 3			42.000	41.764	0.236	40.051	39.926	0.125	0.375	12	36
M 42 × 2			42.000	41.820	0.180	40.701	40.595	0.106	0.250	8.5	25
M 42 × 1.5			42.000	41.850	0.150	41.026	40.931	0.095	0.188	6.3	19
M 45 × 4			45.000	44.700	0.300	42.402	42.262	0.140	0.500	18	53