



International
Standard

ISO 965-2

**ISO general purpose metric screw
threads — Tolerances —**

Part 2:

**Limits of sizes for internal and
external threads (tolerance classes
6H and 6g for M1,6 to M100 and 5H
and 6h for M1 to M1,4)**

Filetages métriques ISO pour usages généraux — Tolérances —

*Partie 2: Dimensions limites pour filetages intérieurs et extérieurs
(classes de tolérance 6H et 6g pour M1,6 à M100 et 5H et 6h pour
M1 à M1,4)*

**Fourth edition
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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 1, *Screw threads*.

This fourth edition cancels and replaces the third edition (ISO 965-2:1998), which has been technically revised. It also incorporates the Amendment ISO 965-2:1998/Amd.1:2021.

The main changes are as follows:

- in [Tables 1](#) and [2](#), the large nominal diameters (from 68 mm to 100 mm) have been added;
- in [Tables 1](#) and [2](#), the normal lengths of thread engagement have been updated for M10×1, M12×1,5, M18×2, M20×2 and M22×2 (in [Tables 3](#) and [4](#) in the previous edition).

A list of all parts in the ISO 965 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

ISO general purpose metric screw threads — Tolerances —

Part 2:

Limits of sizes for internal and external threads (tolerance classes 6H and 6g for M1,6 to M100 and 5H and 6h for M1 to M1,4)

1 Scope

This document specifies the limits of sizes for pitch and crest diameters of ISO general purpose metric screw threads (M) conforming to ISO 262 having basic and design profiles according to ISO 68-1.

This document is applicable to the metric fastening screw threads with tolerance classes 6H and 6g for M1,6 to M100 and 5H and 6h for M1 to M1,4.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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

ISO 5408, *Screw threads — Vocabulary*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 5408 apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

4 Designation

A screw thread in conformity with this document shall be designated in accordance with ISO 965-1.

5 Limits of sizes

5.1 General

The limits of sizes specified shall be derived from the fundamental deviations and tolerances specified in ISO 965-1.

For coated threads, the tolerance classes shall apply to the parts before coating, unless otherwise stated.

After coating, the actual screw thread profile shall not, at any point, transgress the maximum material limit for the tolerance position H or h. A maximum torque can be given in the relevant coating product standards.

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When the maximum, or lower, torque is applied, the GO thread plug gauge shall pass through the coated internal threads or the GO thread ring gauge shall pass over the coated external threads.

NOTE These provisions are intended for thin coatings, e.g. those obtained by electroplating.

The root contours and truncations of screw threads shall be according to ISO 965-1.

5.2 Internal threads

Tolerance quality: Medium

Length group of thread engagement: Normal

Tolerance class:

- 5H for screw threads with nominal diameters up to and including 1,4 mm;
- 6H for screw threads with nominal diameters over 1,4 mm.

The limits of sizes for internal threads with the tolerance classes above shall be as specified in [Table 1](#).

Table 1 — Limits of sizes for internal threads

Dimensions in millimetres

Nominal diameter D	Pitch P	Length of thread engagement		Pitch diameter D_2		Minor diameter D_1	
		over	up to and including	max.	min.	max.	min.
1	0,25	0,6	1,7	0,894	0,838	0,785	0,729
1,2	0,25	0,6	1,7	1,094	1,038	0,985	0,929
1,4	0,3	0,7	2	1,265	1,205	1,142	1,075
1,6	0,35	0,8	2,6	1,458	1,373	1,321	1,221
1,8	0,35	0,8	2,6	1,658	1,573	1,521	1,421
2	0,4	1	3	1,830	1,740	1,679	1,567
2,5	0,45	1,3	3,8	2,303	2,208	2,138	2,013
3	0,5	1,5	4,5	2,775	2,675	2,599	2,459
3,5	0,6	1,7	5	3,222	3,110	3,010	2,850
4	0,7	2	6	3,663	3,545	3,422	3,242
5	0,8	2,5	7,5	4,605	4,480	4,334	4,134
6	1	3	9	5,500	5,350	5,153	4,917
7	1	3	9	6,500	6,350	6,153	5,917
8	1	3	9	7,500	7,350	7,153	6,917
8	1,25	4	12	7,348	7,188	6,912	6,647
10	1	3	9	9,500	9,350	9,153	8,917
10	1,25	4	12	9,348	9,188	8,912	8,647
10	1,5	5	15	9,206	9,026	8,676	8,376
12	1,25	4,5	13	11,368	11,188	10,912	10,647
12	1,5	5,6	16	11,216	11,026	10,676	10,376
12	1,75	6	18	11,063	10,863	10,441	10,106
14	1,5	5,6	16	13,216	13,026	12,676	12,376
14	2	8	24	12,913	12,701	12,210	11,835
16	1,5	5,6	16	15,216	15,026	14,676	14,376
16	2	8	24	14,913	14,701	14,210	13,835

Table 1 (continued)

Nominal diameter D	Pitch P	Length of thread engagement		Pitch diameter D_2		Minor diameter D_1	
		over	up to and including	max.	min.	max.	min.
18	1,5	5,6	16	17,216	17,026	16,676	16,376
18	2	8	24	16,913	16,701	16,210	15,835
18	2,5	10	30	16,600	16,376	15,744	15,294
20	1,5	5,6	16	19,216	19,026	18,676	18,376
20	2	8	24	18,913	18,701	18,210	17,835
20	2,5	10	30	18,600	18,376	17,744	17,294
22	1,5	5,6	16	21,216	21,026	20,676	20,376
22	2	8	24	20,913	20,701	20,210	19,835
22	2,5	10	30	20,600	20,376	19,744	19,294
24	2	8,5	25	22,925	22,701	22,210	21,835
24	3	12	36	22,316	22,051	21,252	20,752
27	2	8,5	25	25,925	25,701	25,210	24,835
27	3	12	36	25,316	25,051	24,252	23,752
30	2	8,5	25	28,925	28,701	28,210	27,835
30	3,5	15	45	28,007	27,727	26,771	26,211
33	2	8,5	25	31,925	31,701	31,210	30,835
33	3,5	15	45	31,007	30,727	29,771	29,211
36	3	12	36	34,316	34,051	33,252	32,752
36	4	18	53	33,702	33,402	32,270	31,670
39	3	12	36	37,316	37,051	36,252	35,752
39	4	18	53	36,702	36,402	35,270	34,670
42	3	12	36	40,316	40,051	39,252	38,752
42	4,5	21	63	39,392	39,077	37,799	37,129
45	3	12	36	43,316	43,051	42,252	41,752
45	4,5	21	63	42,392	42,077	40,799	40,129
48	3	15	45	46,331	46,051	45,252	44,752
48	5	24	71	45,087	44,752	43,297	42,587
52	4	19	56	49,717	49,402	48,270	47,670
52	5	24	71	49,087	48,752	47,297	46,587
56	4	19	56	53,717	53,402	52,270	51,670
56	5,5	28	85	52,783	52,428	50,796	50,046
60	4	19	56	57,717	57,402	56,270	55,670
60	5,5	28	85	56,783	56,428	54,796	54,046
64	4	19	56	61,717	61,402	60,270	59,670
64	6	32	95	60,478	60,103	58,305	57,505
68	4	19	56	65,717	65,402	64,270	63,670
68	6	32	95	64,478	64,103	62,305	61,505
72	4	19	56	69,717	69,402	68,270	67,670
72	6	32	95	68,478	68,103	66,305	65,505
76	4	19	56	73,717	73,402	72,270	71,670
76	6	32	95	72,478	72,103	70,305	69,505
80	4	19	56	77,717	77,402	76,270	75,670

Table 1 (continued)

Nominal diameter D	Pitch P	Length of thread engagement		Pitch diameter D_2		Minor diameter D_1	
		over	up to and including	max.	min.	max.	min.
80	6	32	95	76,478	76,103	74,305	73,505
85	4	19	56	82,717	82,402	81,270	80,670
85	6	32	95	81,478	81,103	79,305	78,505
90	4	19	56	87,717	87,402	86,270	85,670
90	6	32	95	86,478	86,103	84,305	83,505
95	4	24	71	92,737	92,402	91,270	90,670
95	6	36	106	91,503	91,103	89,305	88,505
100	4	24	71	97,737	97,402	96,270	95,670
100	6	36	106	96,503	96,103	94,305	93,505

5.3 External threads

Tolerance quality: Medium

Length group of thread engagement: Normal

Tolerance class:

- 6h for screw threads with nominal diameters up to and including 1,4 mm;
- 6g for screw threads with nominal diameters over 1,4 mm.

The limits of sizes for external threads with the tolerance classes above shall be as specified in [Table 2](#).

Table 2 — Limits of sizes for external threads

Dimensions in millimetres

Nominal diameter d	Pitch P	Length of thread engagement		Major diameter d		Pitch diameter d_2	
		over	up to and including	max.	min.	max.	min.
1	0,25	0,6	1,7	1,000	0,933	0,838	0,785
1,2	0,25	0,6	1,7	1,200	1,133	1,038	0,985
1,4	0,3	0,7	2	1,400	1,325	1,205	1,149
1,6	0,35	0,8	2,6	1,581	1,496	1,354	1,291
1,8	0,35	0,8	2,6	1,781	1,696	1,554	1,491
2	0,4	1	3	1,981	1,886	1,721	1,654
2,5	0,45	1,3	3,8	2,480	2,380	2,188	2,117
3	0,5	1,5	4,5	2,980	2,874	2,655	2,580
3,5	0,6	1,7	5	3,479	3,354	3,089	3,004
4	0,7	2	6	3,978	3,838	3,523	3,433
5	0,8	2,5	7,5	4,976	4,826	4,456	4,361
6	1	3	9	5,974	5,794	5,324	5,212
7	1	3	9	6,974	6,794	6,324	6,212
8	1	3	9	7,974	7,794	7,324	7,212
8	1,25	4	12	7,972	7,760	7,160	7,042

NOTE For the minimum root radius, see ISO 965-1.

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Table 2 (continued)

Nominal diameter d	Pitch P	Length of thread engagement		Major diameter d		Pitch diameter d_2	
		over	up to and including	max.	min.	max.	min.
10	1	3	9	9,974	9,794	9,324	9,212
10	1,25	4	12	9,972	9,760	9,160	9,042
10	1,5	5	15	9,968	9,732	8,994	8,862
12	1,25	4,5	13	11,972	11,760	11,160	11,028
12	1,5	5,6	16	11,968	11,732	10,994	10,854
12	1,75	6	18	11,966	11,701	10,829	10,679
14	1,5	5,6	16	13,968	13,732	12,994	12,854
14	2	8	24	13,962	13,682	12,663	12,503
16	1,5	5,6	16	15,968	15,732	14,994	14,854
16	2	8	24	15,962	15,682	14,663	14,503
18	1,5	5,6	16	17,968	17,732	16,994	16,854
18	2	8	24	17,962	17,682	16,663	16,503
18	2,5	10	30	17,958	17,623	16,334	16,164
20	1,5	5,6	16	19,968	19,732	18,994	18,854
20	2	8	24	19,962	19,682	18,663	18,503
20	2,5	10	30	19,958	19,623	18,334	18,164
22	1,5	5,6	16	21,968	21,732	20,994	20,854
22	2	8	24	21,962	21,682	20,663	20,503
22	2,5	10	30	21,958	21,623	20,334	20,164
24	2	8,5	25	23,962	23,682	22,663	22,493
24	3	12	36	23,952	23,577	22,003	21,803
27	2	8,5	25	26,962	26,682	25,663	25,493
27	3	12	36	26,952	26,577	25,003	24,803
30	2	8,5	25	29,962	29,682	28,663	28,493
30	3,5	15	45	29,947	29,522	27,674	27,462
33	2	8,5	25	32,962	32,682	31,663	31,493
33	3,5	15	45	32,947	32,522	30,674	30,462
36	3	12	36	35,952	35,577	34,003	33,803
36	4	18	53	35,940	35,465	33,342	33,118
39	3	12	36	38,952	38,577	37,003	36,803
39	4	18	53	38,940	38,465	36,342	36,118
42	3	12	36	41,952	41,577	40,003	39,803
42	4,5	21	63	41,937	41,437	39,014	38,778
45	3	12	36	44,952	44,577	43,003	42,803
45	4,5	21	63	44,937	44,437	42,014	41,778
48	3	15	45	47,952	47,577	46,003	45,791
48	5	24	71	47,929	47,399	44,681	44,431
52	4	19	56	51,940	51,465	49,342	49,106
52	5	24	71	51,929	51,399	48,681	48,431
56	4	19	56	55,940	55,465	53,342	53,106
56	5,5	28	85	55,925	55,365	52,353	52,088

NOTE For the minimum root radius, see ISO 965-1.