BRITISH STANDARD

BS ISO
965-2:1998

ISO general purpose metric screw threads — Tolerances —

Part 2: Limits of sizes for general purpose external and internal screw threads — Medium quality

ICS 21.040.10

National foreword

This British Standard reproduces verbatim ISO 965-2:1998 and implements it as the UK national standard.

The UK participation in its preparation was entrusted by Technical Committee FME/9, Bolts, nuts and accessories, to Subcommittee FME/9/3, Reference standards for fasteners, which has the responsibility to:

— aid enquirers to understand the text;

— present to the responsible international/European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, the ISO title page, pages ii to iv, pages 1 to 5 and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

This British Standard, having been prepared under the direction of the Engineering Sector Committee, was published under the authority of the Standards Committee and comes into effect on 15 April 1999

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STANDARD 965-2

Third edition
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Partie 2: Dimensions limites pour filetages intérieurs et extérieurs d'usages généraux — Qualité moyenne

Reference number
ISO 965-2:1998(E)

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Descriptors: Screw threads, ISO metric threads, threads for bolts, dimensions, dimensional tolerances, designation.

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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 965-2 was prepared by Technical Committee ISO/TC 1, *Screw threads*, Subcommittee SC 2, *Tolerances*.

This third edition cancels and replaces the second edition (ISO 965-2:1980), which has been technically revised.

ISO 965 consists of the following parts, under the general title *ISO general purpose metric screw threads — Tolerances*

— *Part 1: Principles and basic data;*

— *Part 2: Limits of sizes for general purpose bolt and nut threads — Medium quality;*

— *Part 3: Deviations for constructional screw threads;*

— *Part 4: Limits of sizes for hot-dip galvanized external threads to mate with internal threads tapped with tolerance position H or G after galvanizing;*

— *Part 5: Limits of sizes for internal screw threads to mate with hot-dip galvanized external screw threads with maximum size of tolerance position h before galvanizing.*

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1 Scope

This part of ISO 965 specifies limits of sizes for pitch and crest diameters for ISO general purpose metric screw threads (M) conforming to ISO 262 having basic profile according to ISO 68-1.

The limits of sizes for the tolerance quality specified are derived from the fundamental deviations and tolerances specified in ISO 965-1.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 965. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO 965 are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 68-1:1998, *ISO general purpose screw threads Basic profile — Part 1: Metric screw threads.*

ISO 262:1998, *ISO general purpose metric screw threads — Selected sizes for screws, bolts and nuts.*

ISO 965-1:1998, *ISO general purpose metric screw threads — Tolerances — Part 1: Principles and basic data.*

ISO 5408:1983, *Cylindrical screw threads — Vocabulary.*

3 Definitions

For the purpose of this part of ISO 965 the definitions given in ISO 5408 apply.

4 Designation

A screw thread in conformity with this part of ISO 965 shall be designated according to ISO 965-1.

5 Limits of sizes

The root contour shall not at any point transgress the basic profile.

For coated threads, the tolerances apply to the parts before coating, unless otherwise stated. After coating, the actual thread profile shall not at any point transgress the maximum material limits for position H or h respectively.

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

5.1 Internal threads — Coarse thread series

Tolerance quality: medium

Thread engagement group: normal

Tolerance class: 5H for threads up to and including M1,4
6H for threads over M1,4

Table 1

Dimensions in millimetres

Thread	Length of thread engagement		Pitch diameter D_2		Minor diameter D_1	
	over	up to and including	max.	min.	max.	min.
M1	0,6	1,7	0,894	0,838	0,785	0,729
M1,2	0,6	1,7	1,094	1,038	0,985	0,929
M1,4	0,7	2	1,265	1,205	1,142	1,075
M1,6	0,8	2,6	1,458	1,373	1,321	1,221
M1,8	0,8	2,6	1,658	1,573	1,521	1,421
M2	1	3	1,830	1,740	1,679	1,567
M2,5	1,3	3,8	2,303	2,208	2,138	2,013
M3	1,5	4,5	2,775	2,675	2,599	2,459
M3,5	1,7	5	3,222	3,110	3,010	2,850
M4	2	6	3,663	3,545	3,422	3,242
M5	2,5	7,5	4,605	4,480	4,334	4,134
M6	3	9	5,500	5,350	5,153	4,917
M7	3	9	6,500	6,350	6,153	5,917
M8	4	12	7,348	7,188	6,912	6,647
M10	5	15	9,206	9,026	8,676	8,376
M12	6	18	11,063	10,863	10,441	10,106
M14	8	24	12,913	12,701	12,210	11,835
M16	8	24	14,913	14,701	14,210	13,835
M18	10	30	16,600	16,376	15,744	15,294
M20	10	30	18,600	18,376	17,744	17,294
M22	10	30	20,600	20,376	19,744	19,294
M24	12	36	22,316	22,051	21,252	20,752
M27	12	36	25,316	25,051	24,252	23,752
M30	15	45	28,007	27,727	26,771	26,211
M33	15	45	31,007	30,727	29,771	29,211
M36	18	53	33,702	33,402	32,270	31,670
M39	18	53	36,702	36,402	35,270	34,670
M42	21	63	39,392	39,077	37,799	37,129
M45	21	63	42,392	42,077	40,799	40,129
M48	24	71	45,087	44,752	43,297	42,587
M52	24	71	49,087	48,752	47,297	46,587
M56	28	85	52,783	52,428	50,796	50,046
M60	28	85	56,783	56,428	54,796	54,046
M64	32	95	60,478	60,103	58,305	57,505

5.2 External threads — Coarse thread series

Tolerance quality: medium

Thread engagement group: normal

Tolerance class: 6h for threads up to and including M1,4
6g for threads over M1,4

Table 2

Dimensions in millimetres

Thread	Length of thread engagement		Major diameter d		Pitch diameter d_2		Root radius
	over	up to and including	max.	min.	max.	min.	min.[a]
M1	0,6	1,7	1,000	0,933	0,838	0,785	0,031
M1,2	0,6	1,7	1,200	1,133	1,038	0,985	0,031
M1,4	0,7	2	1,400	1,325	1,205	1,149	0,038
M1,6	0,8	2,6	1,581	1,496	1,354	1,291	0,044
M1,8	0,8	2,6	1,781	1,696	1,554	1,491	0,044
M2	1	3	1,981	1,886	1,721	1,654	0,050
M2,5	1,3	3,8	2,480	2,380	2,188	2,117	0,056
M3	1,5	4,5	2,980	2,874	2,655	2,580	0,063
M3,5	1,7	5	3,479	3,354	3,089	3,004	0,075
M4	2	6	3,978	3,838	3,523	3,433	0,088
M5	2,5	7,5	4,976	4,826	4,456	4,361	0,100
M6	3	9	5,974	5,794	5,324	5,212	0,125
M7	3	9	6,974	6,794	6,324	6,212	0,125
M8	4	12	7,972	7,760	7,160	7,042	0,156
M10	5	15	9,968	9,732	8,994	8,862	0,188
M12	6	18	11,966	11,701	10,829	10,679	0,219
M14	8	24	13,962	13,682	12,663	12,503	0,250
M16	8	24	15,962	15,682	14,663	14,503	0,250
M18	10	30	17,958	17,623	16,334	16,164	0,313
M20	10	30	19,958	19,623	18,334	18,164	0,313
M22	10	30	21,958	21,623	20,334	20,164	0,313
M24	12	36	23,952	23,577	22,003	21,803	0,375
M27	12	36	26,952	26,577	25,003	24,803	0,375
M30	15	45	29,947	29,522	27,674	27,462	0,438
M33	15	45	32,947	32,522	30,674	30,462	0,438
M36	18	53	35,940	35,465	33,342	33,118	0,500
M39	18	53	38,940	38,465	36,342	36,118	0,500
M42	21	63	41,937	41,437	39,014	38,778	0,563
M45	21	63	44,937	44,437	42,014	41,778	0,563
M48	24	71	47,929	47,399	44,681	44,431	0,625
M52	24	71	51,929	51,399	48,681	48,431	0,625
M56	28	85	55,925	55,365	52,353	52,088	0,688
M60	28	85	59,925	59,365	56,353	56,088	0,688
M64	32	95	63,920	63,320	60,023	59,743	0,750

[a] See ISO 965-1.

5.3 Internal threads — Fine thread series

Tolerance quality: medium

Thread engagement group: normal

Tolerance class: 6H

Table 3

Dimensions in millimetres

Thread	Length of thread engagement		Pitch diameter D_2		Minor diameter D_1	
	over	up to and including	max.	min.	max.	min.
M8 × 1	3	9	7,500	7,350	7,153	6,917
M10 × 1	4	12	9,500	9,350	9,153	8,917
M10 × 1,25	4	12	9,348	9,188	8,912	8,647
M12 × 1,25	4,5	13	11,368	11,188	10,912	10,647
M12 × 1,5	4,5	13	11,216	11,026	10,676	10,376
M14 × 1,5	5,6	16	13,216	13,026	12,676	12,376
M16 × 1,5	5,6	16	15,216	15,026	14,676	14,376
M18 × 1,5	5,6	16	17,216	17,026	16,676	16,376
M18 × 2	5,6	16	16,913	16,701	16,210	15,835
M20 × 1,5	5,6	16	19,216	19,026	18,676	18,376
M20 × 2	5,6	16	18,913	18,701	18,210	17,835
M22 × 1,5	5,6	16	21,216	21,026	20,676	20,376
M22 × 2	5,6	16	20,913	20,701	20,210	19,835
M24 × 2	8,5	25	22,925	22,701	22,210	21,835
M27 × 2	8,5	25	25,925	25,701	25,210	24,835
M30 × 2	8,5	25	28,925	28,701	28,210	27,835
M33 × 2	8,5	25	31,925	31,701	31,210	30,835
M36 × 3	12	36	34,316	34,051	33,252	32,752
M39 × 3	12	36	37,316	37,051	36,252	35,752
M42 × 3	12	36	40,316	40,051	39,252	38,752
M45 × 3	12	36	43,316	43,051	42,252	41,752
M48 × 3	15	45	46,331	46,051	45,252	44,752
M52 × 4	19	56	49,717	49,402	48,270	47,670
M56 × 4	19	56	53,717	53,402	52,270	51,670
M60 × 4	19	56	57,717	57,402	56,270	55,670
M64 × 4	19	56	61,717	61,402	60,270	59,670

5.4 External threads — Fine thread series

Tolerance quality: medium

Thread engagement group: normal

Tolerance class: 6g

Table 4

Dimensions in millimetres

Thread	Length of thread engagement		Major diameter d		Pitch diameter d_2		Root radius
	over	up to and including	max.	min.	max.	min.	min.[a]
M8 × 1	3	9	7,974	7,794	7,324	7,212	0,125
M10 × 1	4	12	9,974	9,794	9,324	9,212	0,125
M10 × 1,25	4	12	9,972	9,760	9,160	9,042	0,156
M12 × 1,25	4,5	13	11,972	11,760	11,160	11,028	0,156
M12 × 1,5	4,5	13	11,968	11,732	10,994	10,854	0,188
M14 × 1,5	5,6	16	13,968	13,732	12,994	12,854	0,188
M16 × 1,5	5,6	16	15,968	15,732	14,994	14,854	0,188
M18 × 1,5	5,6	16	17,968	17,732	16,994	16,854	0,188
M18 × 2	5,6	16	17,962	17,682	16,663	16,503	0,250
M20 × 1,5	5,6	16	19,968	19,732	18,994	18,854	0,188
M20 × 2	5,6	16	19,962	19,682	18,663	18,503	0,250
M22 × 1,5	5,6	16	21,968	21,732	20,994	20,854	0,188
M22 × 2	5,6	16	21,962	21,682	20,663	20,503	0,250
M24 × 2	8,5	25	23,962	23,682	22,663	22,493	0,250
M27 × 2	8,5	25	26,962	26,682	25,663	25,493	0,250
M30 × 2	8,5	25	29,962	29,682	28,663	28,493	0,250
M33 × 2	8,5	25	32,962	32,682	31,663	31,493	0,250
M36 × 3	12	36	35,952	35,577	34,003	33,803	0,375
M39 × 3	12	36	38,952	38,577	37,003	36,803	0,375
M42 × 3	12	36	41,952	41,577	40,003	39,803	0,375
M45 × 3	12	36	44,952	44,577	43,003	42,803	0,375
M48 × 3	15	45	47,952	47,577	46,003	45,791	0,375
M52 × 4	19	56	51,940	51,465	49,342	49,106	0,500
M56 × 4	19	56	55,940	55,465	53,342	53,106	0,500
M60 × 4	19	56	59,940	59,465	57,342	57,106	0,500
M64 × 4	19	56	63,940	63,465	61,342	61,106	0,500

[a] See ISO 965-1.

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