International Standard

ISO 965-5

Second edition
2025-02

ISO general purpose metric screw threads — Tolerances —

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

Filetages métriques ISO pour usages généraux — Tolérances —

Partie 5: Dimensions limites pour filetages intérieurs pour assemblages avec des filetages extérieurs galvanisés à chaud de position de tolérance maximale h avant galvanisation

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ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

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Foreword

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

This second edition cancels and replaces the first edition (ISO 965-5:1998), which has been technically revised. It also incorporates the amendment ISO 965-5:1998/Amd.1:2021.

The main changes are as follows:

— in Clauses 1 and 5, including Table 1, “limit deviations” has been replaced by “fundamental deviations”;

— in Table 1, a small pitch 1 has been added for the tolerance position AZ, and two pitches (1,25 and 1,5) have been deleted for the tolerance position AX;

— in Table 2, the large nominal diameters (from 68 mm to 100 mm) and the two small nominal diameters (6 mm and 7 mm) have been added;

— in Table 3, the large nominal diameters (from 68 mm to 100 mm) have been added, and two small nominal diameters (8 mm and 10 mm) have been deleted;

— in Tables 2 and 3, the minimum major diameter columns have been deleted, respectively.

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

1 Scope

This document specifies the fundamental deviations and limits of sizes for the pitch and minor diameters of ISO general purpose metric internal threads (M) conforming to ISO 262 (M6 to M68 with the coarse pitches and M72 to M100 with pitch 6) having basic and design profiles in accordance with ISO 68-1.

This document is applicable to the metric internal threads oversized to tolerance class 6AZ or 6AX to mate with the hot-dip galvanized external threads with maximum size of tolerance position h before galvanizing.

This document is not applicable to internal threads with coating on thread surface. The limits of sizes before coating are decided by agreement between manufacturer and purchaser.

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 965-4, *ISO general purpose metric screw threads — Tolerances — Part 4: Limits of sizes for hot-dip galvanized external threads to mate with internal threads made to tolerance position H or G after galvanizing*

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 General

There are two tolerance classes for internal threads: 6AZ and 6AX. Tolerance class 6AZ offers a smaller fundamental deviation intended to mate with hot-dip galvanized external threads having a thin coating. Tolerance class 6AX offers a larger fundamental deviation intended to mate with hot-dip galvanized external threads having a heavy coating.

Internal threads oversized to tolerance class 6AZ or 6AX according to this document, shall not be mated with external threads undersized to tolerance class 6az before galvanizing in accordance with ISO 965-4. Such combinations create high probability for screw thread stripping.

Internal threads according to this document shall be made after the hot-dip galvanizing process has been completed. Therefore, no coating is present on the surface of internal threads.

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

5 Fundamental deviations

The fundamental deviations for internal threads shall be as specified in Table 1.

The fundamental deviations, EI_{AZ} and EI_{AX}, have been calculated according to Formulae (1) and (2), respectively:

$$EI_{AZ} = + (300 + 20P) \quad (1)$$

NOTE 1 This is not applicable to threads with $P < 1$ mm.

$$EI_{AX} = + (220P - 20) \quad (2)$$

NOTE 2 This is not applicable to threads with $P < 1{,}75$ mm.

where

EI is the fundamental deviation, expressed in micrometres;

P is the pitch, expressed in millimetres.

Table 1 — Fundamental deviations for internal threads

Pitch P mm	Tolerance position AZ EI_{AZ} µm	Tolerance position AX EI_{AX} µm
1	+320	[a]
1,25	+325	[a]
1,5	+330	[a]
1,75	+335	+365
2	+340	+420
2,5	+350	+530
3	+360	+640
3,5	+370	+750
4	+380	+860
4,5	+390	+970
5	+400	+1 080
5,5	+410	+1 190
6	+420	+1 300
[a] Use the tolerance position AZ.		

6 Limits of sizes

Tolerance quality: Medium

Length group of thread engagement: Normal

Tolerance class: 6AZ and 6AX

The limits of sizes for the internal threads with tolerance classes 6AZ and 6AX shall be as specified in Tables 2 and 3, respectively. They are derived from Formulae (1) and (2) for fundamental deviations and from the tolerances specified in ISO 965-1.

Table 2 — Limits of sizes for the internal threads with tolerance class 6AZ

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.
6	1	3	9	5,820	5,670	5,473	5,237
7	1	3	9	6,820	6,670	6,473	6,237
8	1,25	4	12	7,673	7,513	7,237	6,972
10	1,5	5	15	9,536	9,356	9,006	8,706
12	1,75	6	18	11,398	11,198	10,776	10,441
14	2	8	24	13,253	13,041	12,550	12,175
16	2	8	24	15,253	15,041	14,550	14,175
18	2,5	10	30	16,950	16,726	16,094	15,644
20	2,5	10	30	18,950	18,726	18,094	17,644
22	2,5	10	30	20,950	20,726	20,094	19,644
24	3	12	36	22,676	22,411	21,612	21,112
27	3	12	36	25,676	25,411	24,612	24,112
30	3,5	15	45	28,377	28,097	27,141	26,581
33	3,5	15	45	31,377	31,097	30,141	29,581
36	4	18	53	34,082	33,782	32,650	32,050
39	4	18	53	37,082	36,782	35,650	35,050
42	4,5	21	63	39,782	39,467	38,189	37,519
45	4,5	21	63	42,782	42,467	41,189	40,519
48	5	24	71	45,487	45,152	43,697	42,987
52	5	24	71	49,487	49,152	47,697	46,987
56	5,5	28	85	53,193	52,838	51,206	50,456
60	5,5	28	85	57,193	56,838	55,206	54,456
64	6	32	95	60,898	60,523	58,725	57,925
68	6	32	95	64,898	64,523	62,725	61,925
72	6	32	95	68,898	68,523	66,725	65,925
76	6	32	95	72,898	72,523	70,725	69,925
80	6	32	95	76,898	76,523	74,725	73,925
85	6	32	95	81,898	81,523	79,725	78,925
90	6	32	95	86,898	86,523	84,725	83,925
95	6	36	106	91,923	91,523	89,725	88,925
100	6	36	106	96,923	96,523	94,725	93,925

Table 3 — Limits of sizes for the internal threads with tolerance class 6AX

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.
12	1,75	6	18	11,428	11,228	10,806	10,471
14	2	8	24	13,333	13,121	12,630	12,255
16	2	8	24	15,333	15,121	14,630	14,255
18	2,5	10	30	17,130	16,906	16,274	15,824
20	2,5	10	30	19,130	18,906	18,274	17,824
22	2,5	10	30	21,130	20,906	20,274	19,824
24	3	12	36	22,956	22,691	21,892	21,392
27	3	12	36	25,956	25,691	24,892	24,392
30	3,5	15	45	28,757	28,477	27,521	26,961
33	3,5	15	45	31,757	31,477	30,521	29,961
36	4	18	53	34,562	34,262	33,130	32,530
39	4	18	53	37,562	37,262	36,130	35,530
42	4,5	21	63	40,362	40,047	38,769	38,099
45	4,5	21	63	43,362	43,047	41,769	41,099
48	5	24	71	46,167	45,832	44,377	43,667
52	5	24	71	50,167	49,832	48,377	47,667
56	5,5	28	85	53,973	53,618	51,986	51,236
60	5,5	28	85	57,973	57,618	55,986	55,236
64	6	32	95	61,778	61,403	59,605	58,805
68	6	32	95	65,778	65,403	63,605	62,805
72	6	32	95	69,778	69,403	67,605	66,805
76	6	32	95	73,778	73,403	71,605	70,805
80	6	32	95	77,778	77,403	75,605	74,805
85	6	32	95	82,778	82,403	80,605	79,805
90	6	32	95	87,778	87,403	85,605	84,805
95	6	36	106	92,803	92,403	90,605	89,805
100	6	36	106	97,803	97,403	95,605	94,805

7 Designation

The complete designation of metric screw threads shall be according to ISO 965-1.

The two tolerance class designations for internal threads are 6AZ and 6AX, as specified by ISO 965-5.

EXAMPLE 1 M12 – 6AZ

EXAMPLE 2 M90 × 6 – 6AX