



International
Standard

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**

Filetages métriques ISO pour usages généraux — Tolérances —

*Partie 4: Dimensions limites pour filetages extérieurs galvanisés à
chaud pour assemblages avec des filetages intérieurs en position
de tolérance H ou G après galvanisation*

**Third 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 documents 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 third edition cancels and replaces the second edition (ISO 965-4:2021), which has been technically revised.

The main changes are as follows:

- in [Clauses 1](#) and [5](#), including [Table 1](#), “limit deviations” has been replaced by “fundamental deviations” (Clauses 1 and 6, including Table 1, in the previous edition of this document);
- in [Table 1](#), a small pitch 1 has been added;
- 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.

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 4:

Limits of sizes for hot-dip galvanized external threads to mate with internal threads made to tolerance position H or G after galvanizing

1 Scope

This document specifies the fundamental deviations and limits of sizes for the pitch and major diameters of the hot-dip galvanized metric external 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 hot-dip galvanized metric external threads undersized to tolerance class 6az before galvanizing to mate with the internal threads made to tolerance position H or G after galvanizing.

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 965-5, *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*

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

External threads undersized to tolerance class 6az before galvanizing according to this document shall not be mated with internal threads oversized to tolerance class 6AZ or 6AX in accordance with ISO 965-5. Such combinations create high probability for screw thread stripping.

For hot-dip galvanized external threads, the tolerance class 6az shall be applied to the parts before galvanizing.

After galvanizing, the actual screw thread profile should not, at any point, transgress the maximum material limit for tolerance position h. Specific requirements for coated screw threads are given in the relevant coating standards.

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

5 Fundamental deviations

The fundamental deviations for external threads shall be as specified in [Table 1](#).

The fundamental deviation, es_{az} , has been calculated according to [Formula \(1\)](#):

$$es_{az} = - (300 + 20P) \quad (1)$$

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

where

es_{az} is the fundamental deviation, expressed in micrometres;

P is the pitch, expressed in millimetres.

Table 1 — Fundamental deviations for external threads

Pitch P mm	Tolerance position az es_{az} µm
1	-320
1,25	-325
1,5	-330
1,75	-335
2	-340
2,5	-350
3	-360
3,5	-370
4	-380
4,5	-390
5	-400
5,5	-410
6	-420

6 Limits of sizes

Tolerance quality: Medium

Length group of thread engagement: Normal

Tolerance class: 6az

The limits of sizes for the external threads with tolerance class 6az shall be as specified in [Table 2](#). They are derived from [Formula \(1\)](#) for fundamental deviations and from the tolerances specified in ISO 965-1.

Table 2 — Limits of sizes for the external threads with tolerance class 6az

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.
6	1	3	9	5,680	5,500	5,030	4,918
7	1	3	9	6,680	6,500	6,030	5,918
8	1,25	4	12	7,675	7,463	6,863	6,745
10	1,5	5	15	9,670	9,434	8,696	8,564
12	1,75	6	18	11,665	11,400	10,528	10,378
14	2	8	24	13,660	13,380	12,361	12,201
16	2	8	24	15,660	15,380	14,361	14,201
18	2,5	10	30	17,650	17,315	16,026	15,856
20	2,5	10	30	19,650	19,315	18,026	17,856
22	2,5	10	30	21,650	21,315	20,026	19,856
24	3	12	36	23,640	23,265	21,691	21,491
27	3	12	36	26,640	26,265	24,691	24,491
30	3,5	15	45	29,630	29,205	27,357	27,145
33	3,5	15	45	32,630	32,205	30,357	30,145
36	4	18	53	35,620	35,145	33,022	32,798
39	4	18	53	38,620	38,145	36,022	35,798
42	4,5	21	63	41,610	41,110	38,687	38,451
45	4,5	21	63	44,610	44,110	41,687	41,451
48	5	24	71	47,600	47,070	44,352	44,102
52	5	24	71	51,600	51,070	48,352	48,102
56	5,5	28	85	55,590	55,030	52,018	51,753
60	5,5	28	85	59,590	59,030	56,018	55,753
64	6	32	95	63,580	62,980	59,683	59,403
68	6	32	95	67,580	66,980	63,683	63,403
72	6	32	95	71,580	70,980	67,683	67,403
76	6	32	95	75,580	74,980	71,683	71,403
80	6	32	95	79,580	78,980	75,683	75,403
85	6	32	95	84,580	83,980	80,683	80,403
90	6	32	95	89,580	88,980	85,683	85,403
95	6	36	106	94,580	93,980	90,683	90,383
100	6	36	106	99,580	98,980	95,683	95,383

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

7 Designation

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

The tolerance class designation for external threads is 6az, as specified by ISO 965-4.

EXAMPLE 1 M12 – 6az

EXAMPLE 2 M90 × 6 – 6az

Bibliography

- [1] ISO 68-1, *ISO general purpose screw threads — Basic and design profiles — Part 1: Metric screw threads*
- [2] ISO 262, *ISO general purpose metric screw threads — Selected sizes for bolts, screws, studs and nuts*

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