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Mazdoor Kisan Shakti Sangathan

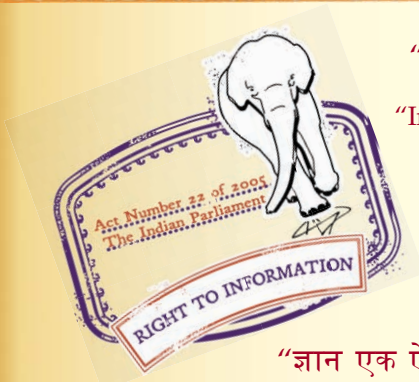
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“पुराने को छोड़ नये के तरफ”

Jawaharlal Nehru

“Step Out From the Old to the New”

IS 14962-4 (2001): ISO General Purpose Metric Screw Threads - Tolerances, Part 4: Limits of Sizes for Hot-Dip Galvanized External Screw Threads to Mate with Internal Screw Threads Tapped with Tolerance Position H or G after Galvanizing [PGD 20: Engineering Standards]



“ज्ञान से एक नये भारत का निर्माण”

Satyanarayan Gangaram Pitroda

“Invent a New India Using Knowledge”



“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

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भारतीय मानक

आई. एस. ओ. सामान्य प्रयोजन की मीटरी
पेंच चूड़ियाँ — छूटें

भाग 4 जस्तीकरण के बाद छूट स्थिति H और G के साथ टैप की हुई
आन्तरिक पेंच चूड़ियों के साथ मिलने वाली हॉट-डिप जस्तीकृत
बाह्य पेंच चूड़ियों के साइजों की छूटें

Indian Standard

ISO GENERAL PURPOSE METRIC SCREW
THREADS — TOLERANCES

PART 4 LIMITS OF SIZES FOR HOT-DIP GALVANIZED EXTERNAL SCREW THREADS
TO MATE WITH INTERNAL SCREW THREADS TAPPED WITH TOLERANCE
POSITION H OR G AFTER GALVANIZING

ICS 21.040.10

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BUREAU OF INDIAN STANDARDS
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NATIONAL FOREWORD

This Indian Standard (Part 4) which is identical with ISO 965-4 : 1998 'ISO general purpose metric screw threads — Tolerances — Part 4 : Limits of sizes for hot-dip galvanized external screw threads to mate with internal screw threads tapped with tolerance position H or G after galvanizing', issued by the International Organization for Standardization (ISO) was adopted by the Bureau of Indian Standards on the recommendation of the Engineering Standards Sectional Committee and approval of the Basic and Production Engineering Division Council.

This Committee, responsible for preparation of Indian Standards on Screw Threads, decided to revise all the six parts of IS 4218 in the following manner:

- a) The revised IS 4218 to be published in four parts, that is (Parts 1 to 4) by adopting ISO 68-1 : 1998, ISO 261 : 1998, ISO 724 : 1993 and ISO 262 : 1998 respectively covering the various requirements of ISO general purpose metric screw threads except tolerances;
- b) For tolerances on ISO general purpose metric screw threads a new standard, that is IS 14962 to be published in five parts, that is (Parts 1 to 5) by adopting ISO 965 (Part 1) : 1998, ISO 965 (Part 2) : 1998, ISO 965 (Part 3) : 1998, ISO 965 (Part 4) : 1998 and ISO 965 (Part 5) : 1998 respectively; and
- c) After the publication of above standards IS 4218 (Part 5) : 1979 and IS 4218 (Part 6) : 1978 stand withdrawn.

The text of ISO Standard has been approved as suitable for publication as an Indian Standard without deviations. In the adopted standard certain conventions are not identical with those used in Indian Standards. Attention is especially drawn to the following:

- a) Wherever the words 'International Standard' appear referring to this standard, they should be read as 'Indian Standard'.
- b) Comma (,) has been used as a decimal marker while in Indian Standards, the current practice is to use a full point (.) as the decimal marker.

In this adopted standard, reference appears to certain International Standards for which Indian Standards also exist. The corresponding Indian Standards which are to be substituted in their place are listed below along with their degree of equivalence for the editions indicated:

<i>International Standard</i>	<i>Corresponding Indian Standard</i>	<i>Degree of Equivalence</i>
ISO 68-1 : 1998	IS 4218 (Part 1) : 2001 ISO general purpose metric screw threads: Part 1 Basic profile (<i>second revision</i>)	Identical
ISO 262 : 1998	IS 4218 (Part 4) : 2001 ISO general purpose metric screw threads: Part 4 Selected sizes for screws, bolts and nuts (<i>second revision</i>)	do
ISO 898-1 : — ¹⁾	IS 1367 (Part 3) : — ²⁾ Technical supply conditions for threaded steel fasteners: Part 3 Mechanical properties of fasteners made of carbon steel and alloy steel — Bolts, screws and studs (<i>fourth revision</i>)	do
ISO 965-1 : 1998	IS 14962 (Part 1) : 2001 ISO general purpose metric screw threads — Tolerances: Part 1 Principles and basic data	do

¹⁾ To be published (Revision of ISO 898-1 : 1988).
²⁾ To be published [Revision of IS 1367 (Part 3) : 1991].

Indian Standard

ISO GENERAL PURPOSE METRIC SCREW THREADS — TOLERANCES

PART 4 LIMITS OF SIZES FOR HOT-DIP GALVANIZED EXTERNAL SCREW THREADS TO MATE WITH INTERNAL SCREW THREADS TAPPED WITH TOLERANCE POSITION H OR G AFTER GALVANIZING

1 Scope

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

External screw threads according to this part of ISO 965 are intended to mate with internal screw threads tapped with tolerance position H or G after hot dip galvanizing.

The limits of sizes for the tolerance quality specified are derived from tolerances specified in ISO 965-1 and the fundamental deviations according to the following formula:

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

where

es is expressed in micrometres;

P is expressed in millimetres.

Products made with thread tolerances in accordance with this part of ISO 965 may show failure at lower ultimate tensile loads than those specified in ISO 898-1 due to reduction of the stress area.

External screw threads with thread tolerances according to this part of ISO 965 must not be mated with internal screw threads with thread tolerances according to ISO 965-5 because such combinations will create severe risk for thread stripping.

NOTE If the tolerance class 6az is not specified the external screw threads are to mate with internal screw threads with tolerance position 6AZ if the products are centrifuged and with hot-dip galvanized internal screw threads with tolerance position 6AX if the products are not centrifuged.

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 898-1:—¹⁾, *Mechanical properties of fasteners made of carbon steel and alloy steel — Part 1: Bolts, screws and studs.*

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

ISO 965-5:1998, *ISO general purpose metric screw threads — Tolerances — 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.*

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

3 Definitions

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

4 Designation

Tolerance designation for external screw threads is 6az.

Example:

M12-6az

1) To be published. (Revision of ISO 898-1:1988)

5 Deviations

The deviations for external screw threads as specified in table 1 are derived from the formula for fundamental deviations below and from tolerances specified in ISO 965-1.

The fundamental deviations, es_{az} , have been calculated according to the following formula:

$$es_{az} = - (300 + 20P).$$

where

es_{az} is expressed in micrometres;

P is expressed in millimetres

Table 1 — Deviations

Thread	Pitch P	External thread tolerance class 6az				
		Pitch diameter		Major diameter		Minor diameter
		es	ei	es	ei	Deviations for stress calculation
	mm	μm	μm	μm	μm	μm
M10	1,5	– 330	– 462	– 330	– 566	– 547
M12	1,75	– 335	– 485	– 335	– 600	– 588
M14, M16	2	– 340	– 500	– 340	– 620	– 629
M18, M20, M22	2,5	– 350	– 520	– 350	– 685	– 711
M24, M27	3	– 360	– 560	– 360	– 735	– 793
M30, M33	3,5	– 370	– 582	– 370	– 795	– 875
M36, M39	4	– 380	– 604	– 380	– 855	– 957
M42, M45	4,5	– 390	– 626	– 390	– 890	– 1 040
M48, M52	5	– 400	– 650	– 400	– 930	– 1 122
M56, M60	5,5	– 410	– 675	– 410	– 970	– 1 204
M64	6	– 420	– 700	– 420	– 1 020	– 1 286

6 Limits of sizes – External screw threads – Coarse thread series

Tolerance quality: medium

Thread engagement group: normal

Tolerance class: 6az

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

For hot-dip galvanized screw threads, the tolerances apply to the parts before galvanizing. After galvanizing, the actual thread profile shall not at any point transgress the maximum material limits for tolerance position h and are intended to mate with internal screw threads of tolerance position H or G only.

Table 2 — External thread limits for tolerance class 6az

Dimensions in millimetres

Thread	Length of thread engagement		Major diameter		Pitch diameter		Minor diameter (for stress calculation)	Root radius
	over	up to and including	max.	min.	max.	min.	max.	min.
M10	5	15	9,670	9,434	8,696	8,564	7,829	0,188
M12	6	18	11,665	11,400	10,528	10,378	9,518	0,219
M14	8	24	13,660	13,380	12,361	12,201	11,206	0,250
M16	8	24	15,660	15,380	14,361	14,201	13,206	0,250
M18	10	30	17,650	17,315	16,026	15,856	14,583	0,313
M20	10	30	19,650	19,315	18,026	17,856	16,583	0,313
M22	10	30	21,650	21,315	20,026	19,856	18,583	0,313
M24	12	36	23,640	23,265	21,691	21,491	19,959	0,375
M27	12	36	26,640	26,265	24,691	24,491	22,959	0,375
M30	15	45	29,630	29,205	27,357	27,145	25,336	0,438
M33	15	45	32,630	32,205	30,357	30,145	28,336	0,438
M36	18	53	35,620	35,145	33,022	32,798	30,713	0,500
M39	18	53	38,620	38,145	36,022	35,798	33,713	0,500
M42	21	63	41,610	41,110	38,687	38,451	36,089	0,563
M45	21	63	44,610	44,110	41,687	41,451	39,089	0,563
M48	24	71	47,600	47,070	44,352	44,102	41,465	0,625
M52	24	71	51,600	51,070	48,352	48,102	45,465	0,625
M56	28	85	55,590	55,030	52,018	51,753	48,842	0,688
M60	28	85	59,590	59,030	56,018	55,753	52,842	0,688
M64	32	95	63,580	62,980	59,683	59,403	56,219	0,750

(Continued from second cover)

<i>International Standard</i>	<i>Corresponding Indian Standard</i>	<i>Degree of Equivalence</i>
ISO 965-5 : 1998	IS 14962 (Part 5) : 2001 ISO general purpose metric screw threads — Tolerances: 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	Identical

ISO 5408 : 1983	IS 10587 : 1983 Terminology for screw threads	Modified
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This standard (Part 4) covers the 'Limits of sizes for hot-dip galvanized external screw threads to mate with internal screw threads tapped with tolerance position H or G after galvanizing for ISO general purpose metric screw threads'. The other four parts of the standard are listed below:

<i>IS No.</i>	<i>Title</i>
IS 14962 (Part 1) : 2001/ ISO 965-1 : 1998	ISO general purpose metric screw threads — Tolerances: Part 1 Principles and basic data
IS 14962 (Part 2) : 2001/ ISO 965-2 : 1998	ISO general purpose metric screw threads — Tolerances: Part 2 Limits of sizes for general purposes external and internal screw threads — Medium quality
IS 14962 (Part 3) : 2001/ ISO 965-3 : 1998	ISO general purpose metric screw threads — Tolerances: Part 3 Deviations for constructional screw threads
IS 14962 (Part 5) : 2001/ ISO 965-5 : 1998	ISO general purpose metric screw threads — Tolerances: 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

Indian Standards covering the various requirements of ISO general purpose metric screw threads except tolerances are listed below:

<i>IS No.</i>	<i>Title</i>
IS 4218 (Part 1) : 2001/ ISO 68-1 : 1998	ISO general purpose metric screw threads: Part 1 Basic profile (<i>second revision</i>)
IS 4218 (Part 2) : 2001/ ISO 261 : 1998	ISO general purpose metric screw threads: Part 2 General plan (<i>second revision</i>)
IS 4218 (Part 3) : 1999/ ISO 724 : 1993	ISO general purpose metric screw threads: Part 3 Basic dimensions (<i>second revision</i>)
IS 4218 (Part 4) : 2001/ ISO 262 : 1998	ISO general purpose metric screw threads: Part 4 Selected sizes for screws, bolts and nuts (<i>second revision</i>)

In reporting the results of a test or analysis made in accordance with this standard, if the final value, observed or calculated, is to be rounded off, it shall be done in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'.

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Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Catalogue' and 'Standards : Monthly Additions'.

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Amendments Issued Since Publication

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