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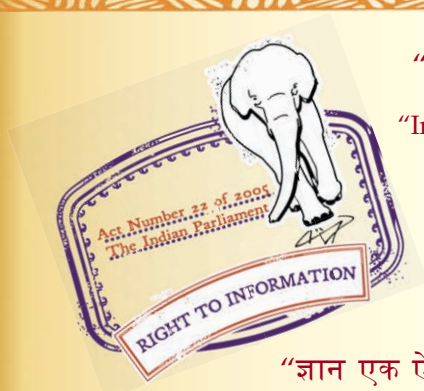
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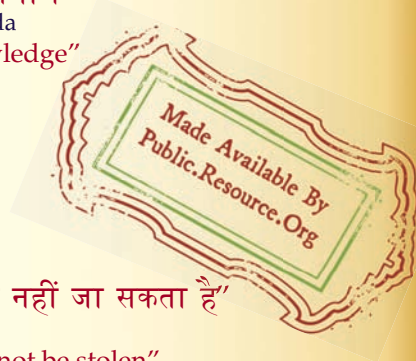
IS 10715-1 (1999): Technical Drawings - Screw Threads and Threaded Parts, Part 1: General Conventions [PGD 24: Drawings]



“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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IS 10715 (Part 1) : 1999
ISO 6410-1 : 1993

(Reaffirmed 2004)

भारतीय मानक

तकनीकी ड्राइंग — पेंच चूड़ियाँ और चूड़ीदार हिस्से

भाग 1 सामान्य कन्वेनशन

(पहला पुनरीक्षण)

Indian Standard

TECHNICAL DRAWINGS — SCREW THREADS AND
THREADED PARTS

PART 1 GENERAL CONVENTIONS

(*First Revision*)

ICS 01.100.20; 21.040.01

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BUREAU OF INDIAN STANDARDS
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NEW DELHI 110002

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Price Group 4

NATIONAL FOREWORD

This Indian Standard (Part 1) (First Revision), which is identical with ISO 6410-1 : 1993 'Technical drawings — Screw threads and threaded parts — Part 1 : General conventions' issued by the International Organization for Standardization (ISO) was adopted by the Bureau of Indian Standards on the recommendation of Drawings Sectional Committee and approval of Light Mechanical Engineering Division Council.

This standard was originally published in 1983 by adopting ISO 6410 : 1981 'Technical drawings — Conventional representation of threaded parts'. ISO 6410 has since been revised in 1993 by splitting it into the following three parts, under the general title 'Technical drawings — Screw threads and threaded parts'.

Part 1 General conventions

Part 2 Screw thread inserts

Part 3 Simplified representation

In view of the above, the committee responsible for the formulation of this standard has also decided to revise IS 10715 : 1983 splitting into three parts by adopting the above three parts of ISO 6410 respectively.

This standard (Part 1) covers the general conventions for technical drawings of screw threads and threaded parts. Other parts of this series are given as follows:

IS 10715 (Part 2) : 1999 Technical drawings — Screw threads and threaded parts : Part 2
Screw thread inserts

IS 10715 (Part 3) : 1999 Technical drawings — Screw threads and threaded parts : Part 3
Simplified representation

The text of ISO has been approved as suitable for publication as Indian Standard without deviations. Certain conventions are, however, not identical to 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 128 : 1982	IS 10714 : 1983 General principles of presentation on technical drawings	Identical
ISO 129 : 1985	IS 11669 : 1986 Technical drawings — Dimensioning — General principles, definitions, methods of execution and special indications	do

(Continued on third cover)

Indian Standard

TECHNICAL DRAWINGS — SCREW THREADS AND THREADED PARTS

PART 1 GENERAL CONVENTIONS

(First Revision)

1 Scope

This part of ISO 6410 specifies methods for representing screw threads and threaded parts on technical drawings.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 6410. 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 6410 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 128:1982, *Technical drawings — General principles of presentation.*

ISO 129:1985, *Technical drawings — Dimensioning — General principles, definitions, methods of execution and special indications.*

ISO 225:1983, *Fasteners — Bolts, screws, studs and nuts — Symbols and designations of dimensions.*

ISO 4753:1983, *Fasteners — Ends of parts with external metric ISO thread.*

ISO 6410-3:1993, *Technical drawings — Screw threads and threaded parts — Part 3: Simplified representation.*

3 Representation

3.1 Detailed representation of threads

In certain types of technical product documentation (e.g. publications, user manuals, etc.) the detailed representation of a thread either in a side view or in a section (see figures 1 to 3) may be needed to illustrate single or assembled parts. Neither pitch nor profile of the threads need usually be drawn exactly to scale.

In technical drawings, the detailed representation of threads (see figures 1 to 3) should only be used if absolutely necessary and whenever possible the helix should be represented by straight lines (see figure 2).

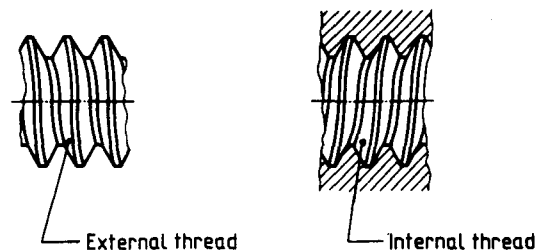


Figure 1

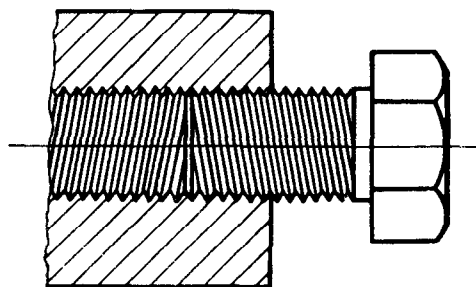


Figure 2

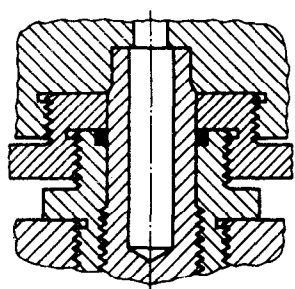


Figure 3

3.2 Conventional representation

Normally, by convention, the representation of threads and threaded parts in all types of technical drawings is simplified as shown in figures 4 to 7.

3.2.1 Views and sections of screw threads

For visible screw threads in side views and sections, the crests¹⁾ of threads shall be defined by a continuous thick line (type A, ISO 128), and the roots²⁾ of threads by a continuous thin line (type B, ISO 128), as shown in figures 4 to 13.

The space between the lines representing the crest and root of the thread should approximate as closely as possible the depth of the thread, but, in all cases, this spacing shall be not less than

- twice the thickness of the thick line, or
- 0,7 mm,

whichever is the larger.

NOTE 1 In certain cases, for example computer-aided draughting,

- a distance of 1,5 mm for threads of nominal diameter $d \geq 8$ mm is generally acceptable;
- a simplified representation is recommended for threads of nominal diameter $d \leq 6$ mm, see ISO 6410-3.

3.2.2 End view of screw threads

On an end view of a screw thread, the thread roots shall be represented by a portion of a circle, drawn with a continuous thin line (type B, ISO 128) approximately equal to three-quarters of the circumference (see figures 4 and 5), preferably open in the right-hand upper quadrant. The thick line representing the chamfer circle is generally omitted on the end view (see figures 4 and 5).

NOTE 2 The portion of the circle may also have any other position relative to the intersecting axes (see figure 6).

3.2.3 Hidden screw threads

Where it is necessary to show hidden screw threads, the crests¹⁾ and the roots²⁾ shall be represented by dashed thin lines (type F, ISO 128), as shown in figure 7.

3.2.4 Hatching of sections of threaded parts

For threaded parts shown in section, hatching shall extend to the line defining the crests of the thread (see figures 5 to 8).

1) "Crest" normally refers to the major diameter for external threads and to the minor diameter for internal threads.

2) "Root" normally refers to the minor diameter for external threads and to the major diameter for internal threads.

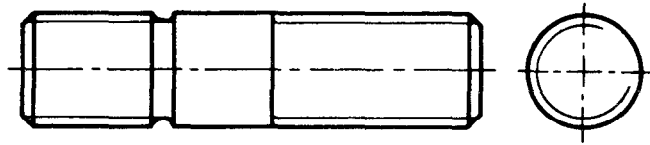


Figure 4

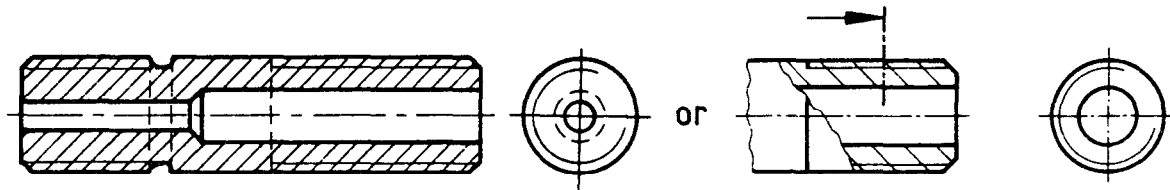


Figure 5

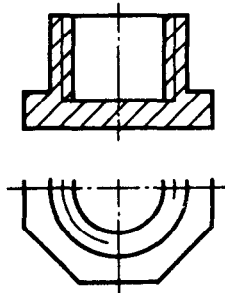


Figure 6

3.2.5 Limit of length of full depth thread

The limit of the length of full depth thread

- shall be shown, if visible, by a continuous thick line (type A, ISO 128)
- may be shown, if hidden, by a dashed line (type F, ISO 128).

These limit lines shall terminate at the lines defining the major diameter of the thread (see figures 4, 8 to 11 and 13).

3.2.6 Thread run-outs

Thread run-outs are beyond the effective ends of the thread except for the end of studs.

They shall be represented by a continuous inclined thin line (type B, ISO 128) if functionally necessary (see figure 8) or for dimensioning (see figure 13). However it is allowed not to represent the run-out wherever possible (see figures 4, 5 and 7).

3.3 Assembled threaded parts

The conventions specified in 3.2 apply also to assemblies of threaded parts. However, externally threaded parts shall always be shown covering internally threaded parts and shall not be hidden by them (see figures 8 and 10). The thick line representing the limit of the useful length of the internal screw thread shall be drawn to the root of the internal thread (see figures 8 and 9).

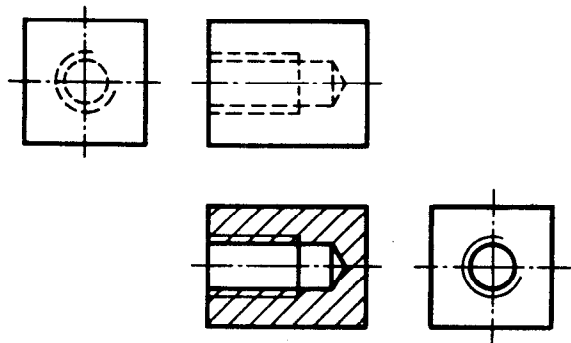


Figure 7

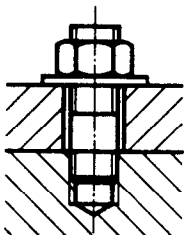


Figure 9

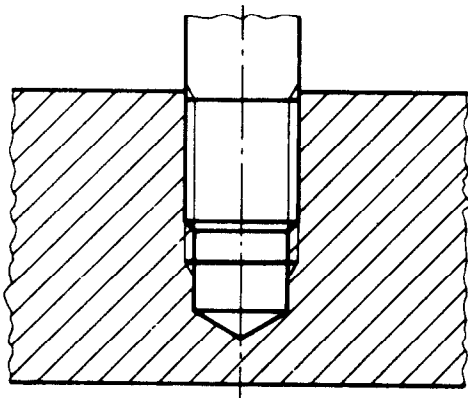


Figure 8

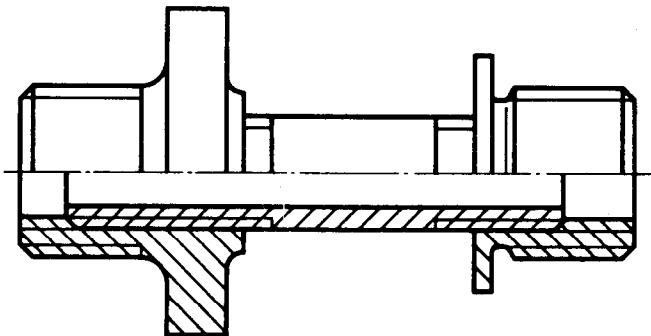


Figure 10

4 Indication and dimensioning of threaded parts

4.1 Designation

The type of screw thread and its dimensions shall be indicated by means of the designation specified in the relevant International Standards for threads.

When indicating the designation on technical drawings, the description block as well as the International Standard block shall be omitted.

In general, the screw thread designation covers

- the abbreviation of the kind of thread (standardized symbol, e.g. M, G, Tr, HA, etc.);
- the nominal diameter or size (e.g. 20; 1/2; 40; 4,5; etc.);

and, if necessary,

- the lead (L), in millimetres;
- the pitch (P), in millimetres;
- the direction of lead (see 4.4);

as well as additional indications, such as

- the tolerance class according to the relevant International Standard;
- thread engagement (S = short, L = long, N = normal);
- the number of starts.

EXAMPLES (taken from International Standards, see annex A)

a) **M20 × 2 - 6G/6h - LH**

b) **M20 × L3 - P1,5 - 6H - S**

c) **G 1/2 A**

d) **Tr 40 × 7**

e) **HA 4,5**

4.2 Dimensioning

4.2.1 The nominal diameter, d , always refers to the crest¹⁾ of the external thread (see figures 11 and 13 or the root²⁾ of the internal thread (see figure 12).

The dimension of the thread length normally refers to the length of the full depth thread (see figure 11) unless the run-out is functionally necessary (e.g. studs) and therefore specifically drawn (see figures 8 and 13).

NOTE 3 Ends of bolts (see ISO 4753) should be included in the length of full depth thread (b) or (l).

All dimensions shall be indicated in accordance with ISO 129 and ISO 225 or in accordance with 4.3.

4.3 Thread length and blind hole depth

It is generally necessary to dimension the length of thread but the blind hole depth may usually be omitted.

The need for indicating the blind hole depth depends mostly on the part itself and the tool used for threading. When the dimension of the hole depth is unspecified, it shall be depicted as being 1,25 times that of the thread length (see figure 14). A short designation as shown in figure 15 may also be used.

4.4 Indication of direction of lead

Right-hand threads need not be denoted in general. Left-hand threads shall be denoted by adding the abbreviation LH to the thread designation. Right-hand and left-hand threads on the same part shall be denoted, in every case. Right-hand threads shall be denoted, if necessary, by adding the abbreviation "RH" to the thread designation.

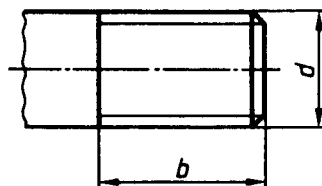


Figure 11

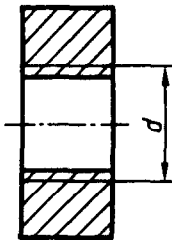


Figure 12

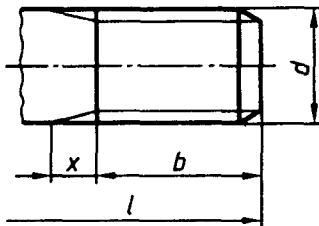


Figure 13

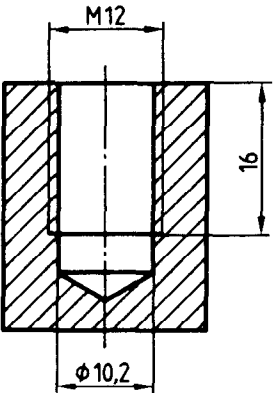


Figure 14

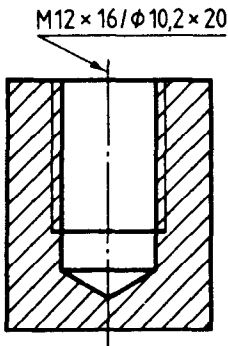


Figure 15

Annex A

(informative)

Bibliography

- [1] ISO 228-1:1982, *Pipe threads where pressure-tight joints are not made on the threads — Part 1: Designation, dimensions and tolerances.*
- [2] ISO 261:—³⁾, *ISO general-purpose metric screw threads — General plan.*
- [3] ISO 262:—⁴⁾, *ISO general-purpose metric screw threads — Selected sizes for screws, bolts and nuts.*
- [4] ISO 965-1:1980, *ISO general purpose metric screw threads — Tolerances — Part 1: Principles and basic data.*
- [5] ISO 2902:1977, *ISO metric trapezoidal screw threads — General plan.*
- [6] ISO 5835:1991, *Implants for surgery — Metal bone screws with hexagonal drive connection, spherical under-surface of head, asymmetrical thread — Dimensions.*
- [7] *International guide to screw threads — Symbols, profiles and designations of threads in standards of various countries*, Beuth Verlag, Berlin.

3) To be published. (Revision of ISO 261:1973)

4) To be published. (Revision of ISO 262:1973)

(Continued from second cover)

<i>International Standard</i>	<i>Corresponding Indian Standard</i>	<i>Degree of Equivalence</i>
ISO 225 : 1983	IS 8536 : 1987 Fasteners — Bolts, screws, studs and nuts — Symbols and designation of dimensions	Identical
ISO 4753 : 1983	IS 1368 : 1987 Dimensions for ends of parts with external ISO metric threads	do
ISO 6410-3 : 1993	IS 10715 (Part 3) : 1999 Technical drawings — Screw threads and threaded parts : Part 3 Simplified representation	do

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Amendments Issued Since Publication

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