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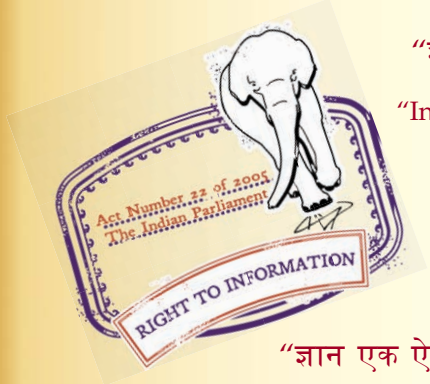

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IS 2643 : 2005
ISO 228-1 : 2000

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(तीसरा पुनरीक्षण)

Indian Standard

PIPE THREADS WHERE PRESSURE-TIGHT JOINTS ARE NOT MADE ON THE THREADS — DIMENSIONS, TOLERANCES AND DESIGNATION

(Third Revision)

ICS 21.040.10

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

July 2005

Price Group 4

NATIONAL FOREWORD

This Indian Standard (Third Revision) which is identical with ISO 228-1 : 2000 'Pipe threads where pressure-tight joints are not made on the threads — Part 1 : Dimensions, tolerances and designation' issued by the International Organization for Standardization (ISO) was adopted by the Bureau of Indian Standards on the recommendations of the Engineering Standards Sectional Committee and approval of the Medical Instruments, General and Production Engineering Division Council.

This standard was originally published in 1964 and subsequently revised in 1975 and 1999. This third revision has been harmonized with ISO 228-1 : 2000 by adoption to make pace with the latest developments taken place at international level.

The text of ISO Standard has been approved as suitable for publication as an Indian Standard without deviations. In the adopted standard certain terminology and conventions are, however, not identical to those used in Indian Standards. Attention is drawn especially 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 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 places are listed below along with their degree of equivalence for the editions indicated:

International Standard	*Corresponding Indian Standard*	*Degree of Equivalence*
ISO 7-1 : 1994 Pipe threads where pressure-tight joints are made on the threads — Part 1 : Dimensions, tolerances and designation	IS 554 : 1999 Pipe threads where pressure-tight joints are made on the threads — Dimensions, tolerances and designation (*fourth revision*)	Identical
ISO 228-2 : 1987 Pipe threads where pressure-tight joints are not made on the threads — Part 2 : Verification by means of limit gauges	IS 10216 : 1988 Pipe threads where pressure-tight joints are not made on the threads — Verification by means of limit guages (*first revision*)	do

The verification of threads covered in this standard shall be done in accordance with IS 10216 : 1988 'Pipe threads where pressure-tight joints are not made on the threads — Verification by means of limit gauges (*first revision*)'.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

PIPE THREADS WHERE PRESSURE-TIGHT JOINTS ARE NOT MADE ON THE THREADS — DIMENSIONS, TOLERANCES AND DESIGNATION

(*Third Revision*)

1 Scope

This part of ISO 228 specifies the requirements for thread form, dimensions, tolerances and designation for fastening pipe threads, thread sizes 1/16 to 6 inclusive. Both internal and external threads are parallel threads, intended for the mechanical assembly of the component parts of fittings, cocks and valves, accessories, etc.

These threads are not suitable as jointing threads where a pressure-tight joint is made on the thread. If assemblies with such threads must be made pressure-tight, this should be effected by compressing two tightening surfaces outside the threads, and by interposing an appropriate seal.

NOTE 1 For pipe threads where pressure-tight joints are made on the threads, see ISO 7-1.

NOTE 2 ISO 228-2 gives details of methods for verification of fastening thread dimensions and form, and recommended gauging systems.

2 Normative reference

The following normative document contains provisions which, through reference in this text, constitute provisions of this part of ISO 228. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of ISO 228 are encouraged to investigate the possibility of applying the most recent editions of the normative document indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 7-1:1994, *Pipe threads where pressure-tight joints are made on the threads — Part 1: Dimensions, tolerances and designation.*

3 Symbols

For the purposes of this part of ISO 228, the following symbols apply.

A Tighter class of tolerance of external pipe threads where pressure-tight joints are not made on the threads

B Wider class of tolerance of external pipe threads where pressure-tight joints are not made on the threads

D = d; major diameter of the internal thread

D_1 = $D - 1{,}280\,654\,P = d_1$; minor diameter of the internal thread

D_2 = $D - 0{,}640\,327\,P = d_2$; pitch diameter of the internal thread

d Major diameter of the external thread

d_1 = $d - 1{,}280\,654\,P$; minor diameter of the external thread

d_2 = $d - 0{,}640\,327\,P$; pitch diameter of the external thread

G Pipe thread where pressure-tight joints are not made on the threads

H Height of the fundamental triangle of the thread

h Height of the thread profile with rounded crests and roots

P Pitch

r Radius of rounded crests and roots

T_{D1} Tolerance on the minor diameter of the internal thread

T_{D2} Tolerance on the pitch diameter of the internal thread

T_d Tolerance on the major diameter of the external thread

T_{d2} Tolerance on the pitch diameter of the external thread

4 Dimensions

The profile of these threads is identical with that of the parallel thread specified in ISO 7-1. The internal and external threads covered by this part of ISO 228 are both parallel.

Unless otherwise specified, the thread in accordance with this part of ISO 228 is a right-hand thread. (See also clause 5.)

Threads are normally of the truncated form, with crests truncated to the limits of tolerance as given in columns 14 and 15 of Table 1. The exception to this is on internal threads, where they are likely to be assembled with external threads in accordance with ISO 7-1, and in which case the thread length shall be equal to or greater than that specified in ISO 7-1.

The tolerances on the pitch diameter of the internal threads correspond to the positive deviation of the diameter tolerances in ISO 7-1, with the exception of those for thread sizes 1/16, 1/8, 1/4 and 3/8, for which slightly higher values are specified.

For external threads, two classes of tolerances on the pitch diameter are specified (see Table 1).

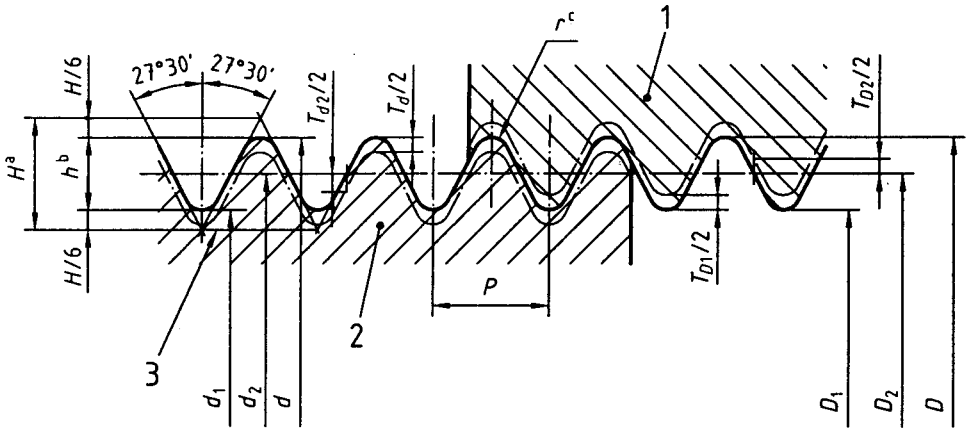
— Class A (column 10) consists of entirely negative tolerances, each equivalent in value to the tolerance for the respective internal thread.

— Class B (column 11) consists of entirely negative tolerances, each with a value of twice that of the respective internal thread.

The choice between class A and class B depends on the conditions of application and shall be made in product standards where threads in accordance with this part of ISO 228 are specified.

Pipe thread dimensions, in millimetres, are given in Table 1.

Figure 1 shows fastening threads with full-form profiles and their tolerance zones.



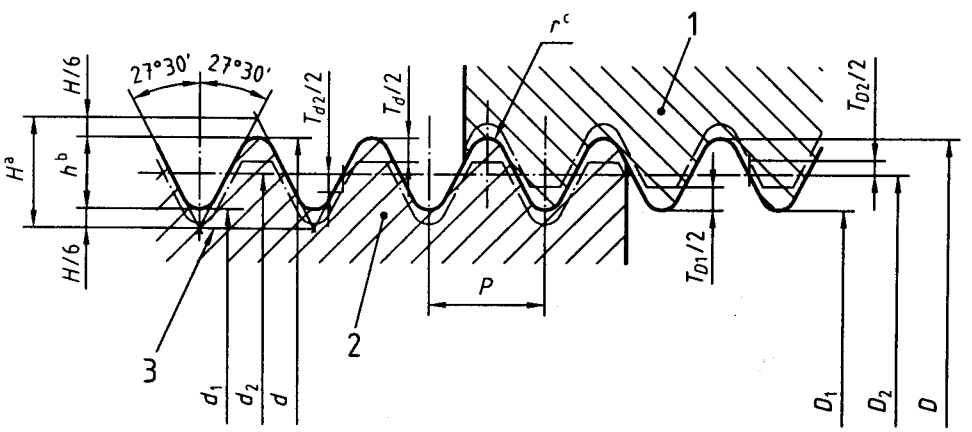
Key

1 Internal thread
2 External thread
3 Fundamental triangle

a $H = 0{,}960\,491\ P$
b $h = 0{,}640\,327\ P$
c $r = 0{,}137\,329\ P$

Figure 1 — Full-form thread profile and tolerance zones

Figure 2 shows fastening threads with truncated profiles and their tolerance zones.



Key

1 Internal thread
2 External thread
3 Fundamental triangle

a $H = 0{,}960\,491\ P$
b $h = 0{,}640\,327\ P$
c $r = 0{,}137\,329\ P$

Figure 2 — Truncated-form thread profile and tolerance zones

Table 1 — Thread dimensions

Dimensions in millimetres

Designation of thread	Number of threads in 25,4 mm	Pitch	Height of thread	Diameters			Tolerances on pitch diameter [a]					Tolerance on minor diameter		Tolerance on major diameter	
							Internal thread T_{D2}		External thread T_{d2}			Internal thread T_{D1}		External thread T_d	
				major	pitch	minor	Lower deviation	Upper deviation	Lower deviation	Lower deviation	Upper deviation	Lower deviation	Upper deviation	Lower deviation	Upper deviation
		P	h	$d = D$	$d_2 = D_2$	$d_1 = D_1$			Class A	Class B					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1/16	28	0,907	0,581	7,723	7,142	6,561	0	+ 0,107	− 0,107	− 0,214	0	0	+ 0,282	− 0,214	0
1/8	28	0,907	0,581	9,728	9,147	8,566	0	+ 0,107	− 0,107	− 0,214	0	0	+ 0,282	− 0,214	0
1/4	19	1,337	0,856	13,157	12,301	11,445	0	+ 0,125	− 0,125	− 0,250	0	0	+ 0,445	− 0,250	0
3/8	19	1,337	0,856	16,662	15,806	14,950	0	+ 0,125	− 0,125	− 0,250	0	0	+ 0,445	− 0,250	0
1/2	14	1,814	1,162	20,955	19,793	18,631	0	+ 0,142	− 0,142	− 0,284	0	0	+ 0,541	− 0,284	0
5/8	14	1,814	1,162	22,911	21,749	20,587	0	+ 0,142	− 0,142	− 0,284	0	0	+ 0,541	− 0,284	0
3/4	14	1,814	1,162	26,441	25,279	24,117	0	+ 0,142	− 0,142	− 0,284	0	0	+ 0,541	− 0,284	0
7/8	14	1,814	1,162	30,201	29,039	27,877	0	+ 0,142	− 0,142	− 0,284	0	0	+ 0,541	− 0,284	0
1	11	2,309	1,479	33,249	31,770	30,291	0	+ 0,180	− 0,180	− 0,360	0	0	+ 0,640	− 0,360	0
1 1/8	11	2,309	1,479	37,897	36,418	34,939	0	+ 0,180	− 0,180	− 0,360	0	0	+ 0,640	− 0,360	0
1 1/4	11	2,309	1,479	41,910	40,431	38,952	0	+ 0,180	− 0,180	− 0,360	0	0	+ 0,640	− 0,360	0
1 1/2	11	2,309	1,479	47,803	46,324	44,845	0	+ 0,180	− 0,180	− 0,360	0	0	+ 0,640	− 0,360	0
1 3/4	11	2,309	1,479	53,746	52,267	50,788	0	+ 0,180	− 0,180	− 0,360	0	0	+ 0,640	− 0,360	0
2	11	2,309	1,479	59,614	58,135	56,656	0	+ 0,180	− 0,180	− 0,360	0	0	+ 0,640	− 0,360	0
2 1/4	11	2,309	1,479	65,710	64,231	62,752	0	+ 0,217	− 0,217	− 0,434	0	0	+ 0,640	− 0,434	0
2 1/2	11	2,309	1,479	75,184	73,705	72,226	0	+ 0,217	− 0,217	− 0,434	0	0	+ 0,640	− 0,434	0
2 3/4	11	2,309	1,479	81,534	80,055	78,576	0	+ 0,217	− 0,217	− 0,434	0	0	+ 0,640	− 0,434	0
3	11	2,309	1,479	87,884	86,405	84,926	0	+ 0,217	− 0,217	− 0,434	0	0	+ 0,640	− 0,434	0
3 1/2	11	2,309	1,479	100,330	98,851	97,372	0	+ 0,217	− 0,217	− 0,434	0	0	+ 0,640	− 0,434	0
4	11	2,309	1,479	113,030	111,551	110,072	0	+ 0,217	− 0,217	− 0,434	0	0	+ 0,640	− 0,434	0
4 1/2	11	2,309	1,479	125,730	124,251	122,772	0	+ 0,217	− 0,217	− 0,434	0	0	+ 0,640	− 0,434	0
5	11	2,309	1,479	138,430	136,951	135,472	0	+ 0,217	− 0,217	− 0,434	0	0	+ 0,640	− 0,434	0
5 1/2	11	2,309	1,479	151,130	149,651	148,172	0	+ 0,217	− 0,217	− 0,434	0	0	+ 0,640	− 0,434	0
6	11	2,309	1,479	163,830	162,351	160,872	0	+ 0,217	− 0,217	− 0,434	0	0	+ 0,640	− 0,434	0

[a] For thin-walled parts, the tolerances apply to the mean pitch diameter, which is the arithmetical mean of two diameters measured at right angles to each other.

5 Designation

The designation of threads shall consist of the following elements in the given sequence.

a) Description block:

Pipe thread

b) International Standard number block:

ISO 228

c) Individual item block (one of the following, as applicable):

— the letter G followed by the designation of the thread size from column 1 of Table 1 for internal threads (one class of tolerance only); or

— the letter G followed by the designation of the thread size from column 1 of Table 1 and the letter A for class A external threads; or

— the letter G followed by the designation of the thread size from column 1 of Table 1 and the letter B for class B external threads.

d) For left-hand threads, the letters LH shall be added to the designation. Right-hand threads require no special designation.

EXAMPLES Complete designation for a right-hand thread size 1 1/2:

—	Internal thread	(one tolerance class only)	**Pipe thread ISO 228 - G 1 1/2**
—	External thread	tolerance class A	**Pipe thread ISO 228 - G 1 1/2 A**
		tolerance class B	**Pipe thread ISO 228 - G 1 1/2 B**

6 Combination with jointing thread

Combining an external parallel thread G, tolerance class A or B, in accordance with ISO 228-1, with an internal parallel thread Rp, in accordance with ISO 7-1, needs special consideration.

When this combination is necessary, the tolerance of the internal thread in accordance with ISO 7-1 shall be considered in the relevant product standards, where external parallel threads G are used.

NOTE Such a combination of threads does not necessarily achieve a leaktight joint.

Annex A
(informative)

References to European Standards

In clauses 2, 4 and 6 of this part of ISO 228 reference is made to ISO 7-1 for pipe threads where pressure-tight joints are made on the threads.

Since the European Standard for pipe threads where pressure-tight joints are made on the threads is numbered differently from ISO 7-1, and considering that EN ISO 228-1 is used by both ISO and CEN (the European Committee for Standardization), the following definitions have been introduced for reference purposes only.

— When EN ISO 228-1 is used as an International Standard, the referenced pipe thread where pressure-tight joints are made on the threads shall be in conformance with ISO 7-1.

— When EN ISO 228-1 is used as a European Standard, the referenced pipe thread where pressure-tight joints are made on the threads shall be in conformance with prEN 10226-1 or prEN 10226-2.

Bibliography

[1] ISO 228-2:1987, *Pipe threads where pressure-tight joints are not made on the threads — Part 2: Verification by means of limit gauges.*

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