INTERNATIONAL STANDARD ISO 228/I

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Pipe threads where pressure-tight joints are not made on the threads — Part I : Designation, dimensions and tolerances

Filetages de tuyauterie pour raccordement sans étanchéité dans le filet — Partie I : Désignation, dimensions et tolérances

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FOREWORD

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Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 228/I was developed by Technical Committee ISO/TC 5, *Metal pipes and fittings*, and was circulated to the member bodies in June 1977.

It has been approved by the member bodies of the following countries :

Australia	Hungary	Romania
Belgium	India	South Africa, Rep. of
Brazil	Israel	Spain
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Finland	New Zealand	Yugoslavia
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Germany	Poland	

No member body expressed disapproval of the document.

This International Standard cancels and replaces ISO Recommendation R 228-1961, of which it constitutes a technical revision.

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Pipe threads where pressure-tight joints are not made on the threads — Part I : Designation, dimensions and tolerances

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies the designation, the dimensions and the tolerances of pipe threads where pressure-tight joints are not made on the threads.

These threads are intended for the mechanical assembly of the component parts of fittings, cocks and valves, etc.

If such assemblies must be made pressure-tight, this will be effected by compressing two tightening surfaces outside the threads, and by interposing an appropriate jointing medium, if necessary.

ISO 228/II will deal with the inspection of these threads.

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

2 REFERENCE

ISO 7/I, *Pipe threads where pressure-tight joints are made on the threads — Part I : Designation, dimensions and tolerances*

3 SYMBOLS AND EXPLANATIONS

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

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

H Height of the triangle of the thread profile

h Height of the thread profile with rounded crests and roots

r Radius of rounded crests and roots

P Pitch

d Basic major diameter of the thread

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

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

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

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

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

T_d Tolerance on the major diameter of the external thread

4 DIMENSIONS

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

The crests of the threads may be truncated to the limits of tolerance as given in columns 12 and 13 of the tables, except on internal threads when they are likely to be assembled with external threads to ISO 7.

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

For external threads, two classes of tolerances on the pitch diameter have been specified :

Class A (column 8) : entirely negative, equivalent in size to the tolerance for the internal thread.

Class B (column 9) : entirely negative, value twice that of class A.

The choice between class A and class B depends on the conditions of application.

Dimensions in millimetres are given in table 1.

Dimensions in inches are given in table 2, in an annex which will be deleted in the next revision.

5 DESIGNATION

Pipe threads complying with this International Standard shall be designated by :

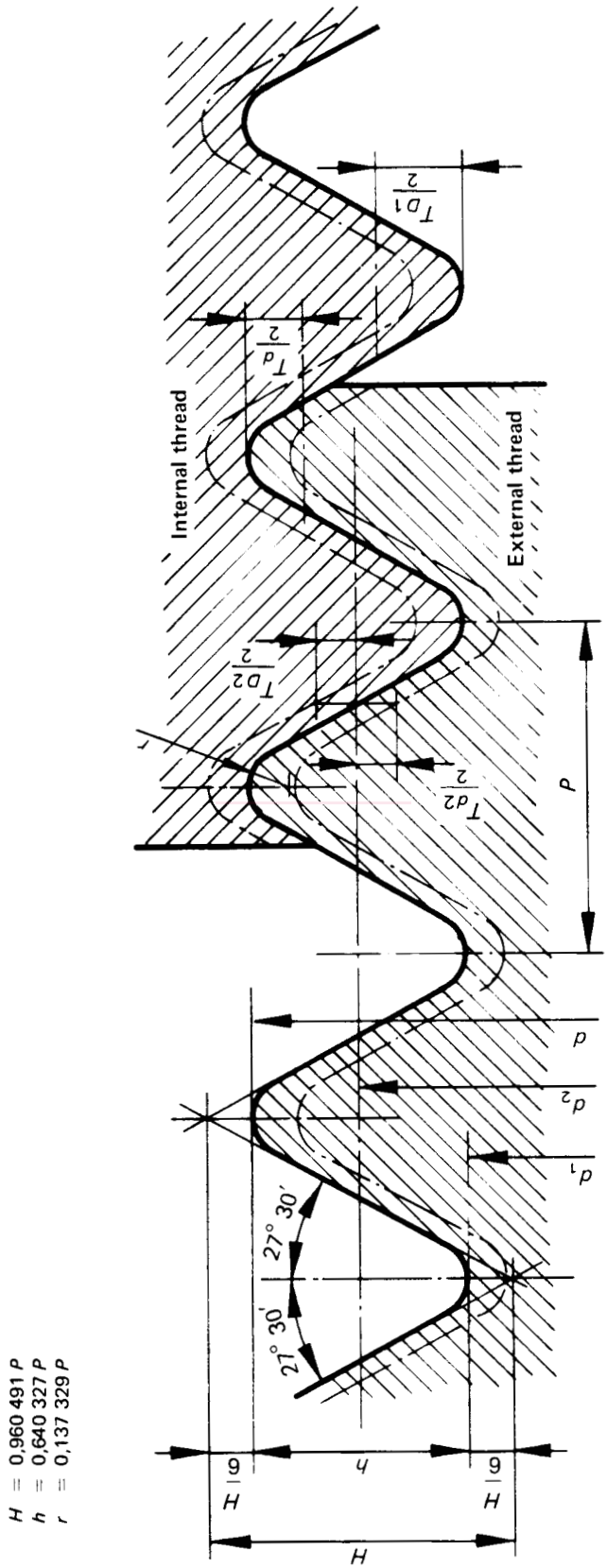
– the letter G followed by the designation of the thread (see table 1, column 1), for internal threads (one class of tolerance only);

– the letter G followed by the designation of the thread and the letter A for class A external threads;

– the letter G followed by the designation of the thread and the letter B for class B external threads.

Examples of the complete designation for thread 1 1/2 are :

Internal thread	**External thread**	
	Class A	Class B
G 1 1/2	**G 1** 1/2 **A**	**G 1** 1/2 **B**



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

FIGURE — Thread profile and tolerance zones

TABLE 1 – **Thread dimensions** (in millimetres)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Designation of thread	**Number of threads in 25,4 mm**	**Pitch** P	**Depth of thread** h	**Basic diameters**			**Permissible tolerances on pitch diameter**[1]					**Tolerance on the minor diameter**		**Tolerance on the major diameter**	
				Major d	Pitch d_2	Minor d_1	**Internal thread** T_{D2}		**External thread** T_{d2}			**Internal thread** T_{D1}		**External thread** T_d	
							Lower deviation	Upper deviation	Lower deviation class A	Lower deviation class B	Upper deviation	Lower deviation	Upper deviation	Lower deviation	Upper deviation
		mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
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

1) 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.

ANNEX[1)]

TABLE 2 – **Thread dimensions** (in inches)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Designation of thread	**Number of threads in 25,4 mm**	**Pitch** P	**Depth of thread** h	**Basic diameters**			**Permissible tolerances on pitch diameter[2)]**					**Tolerance on the minor diameter**		**Tolerance on the major diameter**	
				Major d	Pitch d_2	Minor d_1	**Internal thread** T_{D2}		**External thread** T_{d2}			**Internal thread** T_{D1}		**External thread** T_d	
							Lower deviation	Upper deviation	Lower deviation class A	Lower deviation class B	Upper deviation	Lower deviation	Upper deviation	Lower deviation	Upper deviation
		in	in	in	in	in	in	in	in	in	in	in	in	in	in
1/16	28	0.907	0.581	0.304 0	0.281 1	0.258 2	0	+ 0.004 2	− 0.004 2	− 0.008 4	0	0	+ 0.011 1	− 0.008 4	0
1/8	28	0.907	0.581	0.383 0	0.360 1	0.337 2	0	+ 0.004 2	− 0.004 2	− 0.008 4	0	0	+ 0.011 1	− 0.008 4	0
1/4	19	1.337	0.856	0.518 0	0.484 3	0.450 6	0	+ 0.004 9	− 0.004 9	− 0.009 8	0	0	+ 0.017 5	− 0.009 8	0
3/8	19	1.337	0.856	0.656 0	0.622 3	0.588 6	0	+ 0.004 9	− 0.004 9	− 0.009 8	0	0	+ 0.017 5	− 0.009 8	0
1/2	14	1.814	1.162	0.825 0	0.779 3	0.733 6	0	+ 0.005 6	− 0.005 6	− 0.011 2	0	0	+ 0.021 3	− 0.011 2	0
5/8	14	1.814	1.162	0.902 0	0.856 3	0.810 6	0	+ 0.005 6	− 0.005 6	− 0.011 2	0	0	+ 0.021 3	− 0.011 2	0
3/4	14	1.814	1.162	1.041 0	0.995 3	0.949 6	0	+ 0.005 6	− 0.005 6	− 0.011 2	0	0	+ 0.021 3	− 0.011 2	0
7/8	14	1.814	1.162	1.189 0	1.143 3	1.097 6	0	+ 0.005 6	− 0.005 6	− 0.011 2	0	0	+ 0.021 3	− 0.011 2	0
1	11	2.309	1.479	1.309 0	1.250 8	1.192 6	0	+ 0.007 1	− 0.007 1	− 0.014 2	0	0	+ 0.025 2	− 0.014 2	0
1 1/8	11	2.309	1.479	1.492 0	1.433 8	1.375 6	0	+ 0.007 1	− 0.007 1	− 0.014 2	0	0	+ 0.025 2	− 0.014 2	0
1 1/4	11	2.309	1.479	1.650 0	1.591 8	1.533 6	0	+ 0.007 1	− 0.007 1	− 0.014 2	0	0	+ 0.025 2	− 0.014 2	0
1 1/2	11	2.309	1.479	1.882 0	1.823 8	1.765 6	0	+ 0.007 1	− 0.007 1	− 0.014 2	0	0	+ 0.025 2	− 0.014 2	0
1 3/4	11	2.309	1.479	2.116 0	2.057 8	1.999 6	0	+ 0.007 1	− 0.007 1	− 0.014 2	0	0	+ 0.025 2	− 0.014 2	0
2	11	2.309	1.479	2.347 0	2.288 8	2.230 6	0	+ 0.007 1	− 0.007 1	− 0.014 2	0	0	+ 0.025 2	− 0.014 2	0
2 1/4	11	2.309	1.479	2.587 0	2.528 8	2.470 6	0	+ 0.008 5	− 0.008 5	− 0.017 0	0	0	+ 0.025 2	− 0.017 0	0
2 1/2	11	2.309	1.479	2.960 0	2.901 8	2.843 6	0	+ 0.008 5	− 0.008 5	− 0.017 0	0	0	+ 0.025 2	− 0.017 0	0
2 3/4	11	2.309	1.479	3.210 0	3.151 8	3.093 6	0	+ 0.008 5	− 0.008 5	− 0.017 0	0	0	+ 0.025 2	− 0.017 0	0
3	11	2.309	1.479	3.460 0	3.401 8	3.343 6	0	+ 0.008 5	− 0.008 5	− 0.017 0	0	0	+ 0.025 2	− 0.017 0	0
3 1/2	11	2.309	1.479	3.950 0	3.891 8	3.833 6	0	+ 0.008 5	− 0.008 5	− 0.017 0	0	0	+ 0.025 2	− 0.017 0	0
4	11	2.309	1.479	4.450 0	4.391 8	4.333 6	0	+ 0.008 5	− 0.008 5	− 0.017 0	0	0	+ 0.025 2	− 0.017 0	0
4 1/2	11	2.309	1.479	4.950 0	4.891 8	4.833 6	0	+ 0.008 5	− 0.008 5	− 0.017 0	0	0	+ 0.025 2	− 0.017 0	0
5	11	2.309	1.479	5.450 0	5.391 8	5.333 6	0	+ 0.008 5	− 0.008 5	− 0.017 0	0	0	+ 0.025 2	− 0.017 0	0
5 1/2	11	2.309	1.479	5.950 0	5.891 8	5.833 6	0	+ 0.008 5	− 0.008 5	− 0.017 0	0	0	+ 0.025 2	− 0.017 0	0
6	11	2.309	1.479	6.450 0	6.391 8	6.333 6	0	+ 0.008 5	− 0.008 5	− 0.017 0	0	0	+ 0.025 2	− 0.017 0	0

1) This annex will be deleted in the next revision.

2) 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.