

ISO

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

ISO RECOMMENDATION R 228

PIPE THREADS WHERE PRESSURE-TIGHT JOINTS
ARE NOT MADE ON THE THREADS

(1/8 INCH TO 6 INCHES)

1st EDITION

December 1961

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BRIEF HISTORY

The ISO Recommendation R 228, *Pipe Threads where Pressure-Tight Joints are not made on the Threads (1/8 inch to 6 inches)*, was drawn up by Technical Committee ISO/TC 5, *Pipes and Fittings*, the Secretariat of which is held by the Association Suisse de Normalisation (SNV).

Work on this question by the Technical Committee began in 1953 and led, in 1959, to the adoption of a Draft ISO Recommendation.

In November 1959, this Draft ISO Recommendation (No. 332) was circulated to all the ISO Member Bodies for enquiry. It was approved by the following Member Bodies:

Belgium	France	Italy
Burma	Germany	Netherlands
Chile	Greece	Norway
Czechoslovakia	Hungary	Portugal
Denmark	India	Romania
Finland	Israel	Spain
		Switzerland

Five Member Bodies opposed the approval of the Draft:

Australia, New Zealand, Sweden, United Kingdom, U.S.S.R.

The Draft ISO Recommendation was then submitted by correspondence to the ISO Council, which decided, in December 1961, to accept it as an ISO RECOMMENDATION.

**PIPE THREADS WHERE PRESSURE-TIGHT JOINTS
ARE NOT MADE ON THE THREADS
(1/8 INCH TO 6 INCHES)**

1. SCOPE

The threads covered by this ISO Recommendation are intended for the mechanical assembly of the component parts of fittings, cocks and valves, etc.

2. PROFILE

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

The crests of the threads may be truncated to the limits of tolerance, as given in columns 11, 12, 13 and 14, except on the internal threads, when they are likely to be assembled with external threads conforming to ISO Recommendation R 7.

3. SIZES

This ISO Recommendation provides for a range of diameters which are considered to be necessary to fulfil general requirements. It is recommended to use the diameters in bold type in the first column of the table wherever possible.*

4. TOLERANCES

4.1 For internal threads, the tolerances on the effective diameter, specified in columns 6 and 7 of the table, correspond to the positive deviation of the tolerances on the diameter according to the ISO Recommendation R 7,** with the exception of those of the diameters $\frac{1}{8}$, $\frac{1}{4}$ and $\frac{3}{8}$ in, for which slightly higher values have been specified.

4.2 For external threads, two classes of deviations on the effective diameter have been established:

Class A deviation (col. 8): entirely negative, equivalent to the deviation for the internal thread.

Class B deviation (col. 9): entirely negative, value twice that of Class A.

The choice between Class A or Class B depends on the conditions of application.

5. TABLES

The following tables give the values in inches and millimetres established by starting from the fundamental dimensions, i.e. major diameter and number of threads per inch.

In principle, the values given in the tables are calculated to 0.0001 mm (or to 0.000 01 in) and rounded off to 0.001 mm (or to 0.0001 in). The effective diameter d_2 and the minor diameter d_1 have been obtained by subtracting once, respectively twice, the value h (depth of thread) from the major diameter d .

* These sizes correspond with those in the following ISO Recommendations:
ISO/R 7, Pipe threads for gas list tubes and screwed fittings where pressure-tight joints are made on the threads (1/8 inch to 6 inches);
ISO/R 49, Malleable cast iron pipe fittings screwed in accordance with ISO Recommendation R 7;
ISO/R 50, Steel sockets screwed in accordance with ISO Recommendation R 7. Minimum lengths;
ISO/R 65, Steel tubes suitable for screwing in accordance with ISO Recommendation R 7.

** 1/16 of the tolerances on length (ISO Recommendation R 7, col. 13).

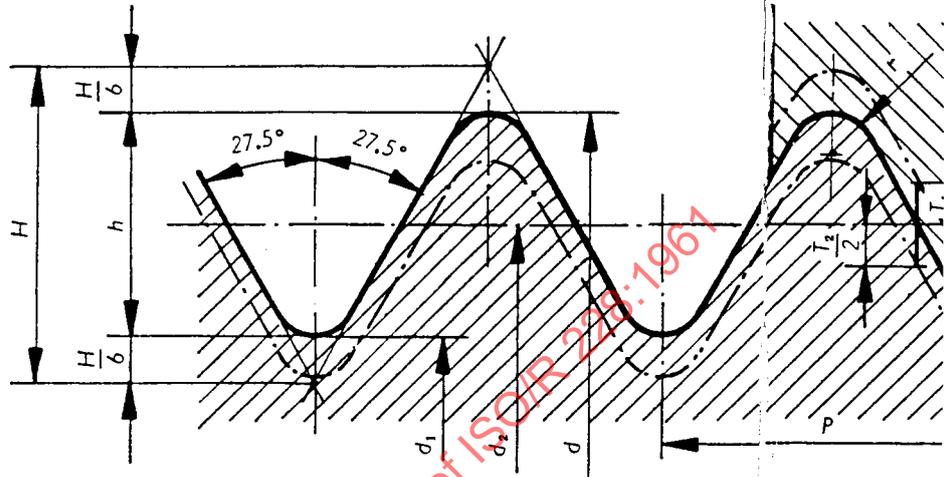
PIPE THREADS WHERE PRESSURE-TIGHT JOINTS

(1/8 INCH TO 6 INCH)

$$H = 0.960\ 491 \times p$$

$$h = 0.640\ 327 \times p$$

$$r = 0.137\ 329 \times p$$



Nominal sizes inches	Number of threads per inch	Basic diameters			Permissible tolerances		
		major <i>d</i> in	effective <i>d</i> ₂ in	minor <i>d</i> ₁ in	Internal thread		Lower Class in
					Lower deviation	Upper deviation	
					<i>T</i> ₁		
					in	in	
1/8	28	0.3830	0.3601	0.3372	0	+ 0.042	- 0.0
1/4	19	0.5180	0.4843	0.4506	0	+ 0.049	- 0.0
3/8	19	0.6560	0.6223	0.5886	0	+ 0.049	- 0.0
1/2	14	0.8250	0.7793	0.7336	0	+ 0.056	- 0.0
5/8	14	0.9020	0.8563	0.8106	0	+ 0.056	- 0.0
3/4	14	1.0410	0.9953	0.9496	0	+ 0.056	- 0.0
7/8	14	1.1890	1.1433	1.0976	0	+ 0.056	- 0.0
1	11	1.3090	1.2508	1.1926	0	+ 0.071	- 0.0
1 1/8	11	1.4920	1.4338	1.3756	0	+ 0.071	- 0.0
1 1/4	11	1.6500	1.5918	1.5336	0	+ 0.071	- 0.0
1 1/2	11	1.8820	1.8238	1.7656	0	+ 0.071	- 0.0
1 3/4	11	2.1160	2.0578	1.9996	0	+ 0.071	- 0.0
2	11	2.3470	2.2888	2.2306	0	+ 0.071	- 0.0
2 1/4	11	2.5870	2.5288	2.4706	0	+ 0.035	- 0.0
2 1/2	11	2.9600	2.9018	2.8436	0	+ 0.035	- 0.0
2 3/4	11	3.2100	3.1518	3.0936	0	+ 0.035	- 0.0
3	11	3.4600	3.4018	3.3436	0	+ 0.035	- 0.0
3 1/2	11	3.9500	3.8918	3.8336	0	+ 0.035	- 0.0
4	11	4.4500	4.3918	4.3336	0	+ 0.035	- 0.0
4 1/2	11	4.9500	4.8918	4.8336	0	+ 0.035	- 0.0
5	11	5.4500	5.3918	5.3336	0	+ 0.035	- 0.0
5 1/2	11	5.9500	5.8918	5.8336	0	+ 0.035	- 0.0
6	11	6.4500	6.3918	6.3336	0	+ 0.035	- 0.0

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

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-TIGHT JOINTS ARE NOT MADE ON THE THREADS
 (1/8 IN. Ø TO 6 INCHES)

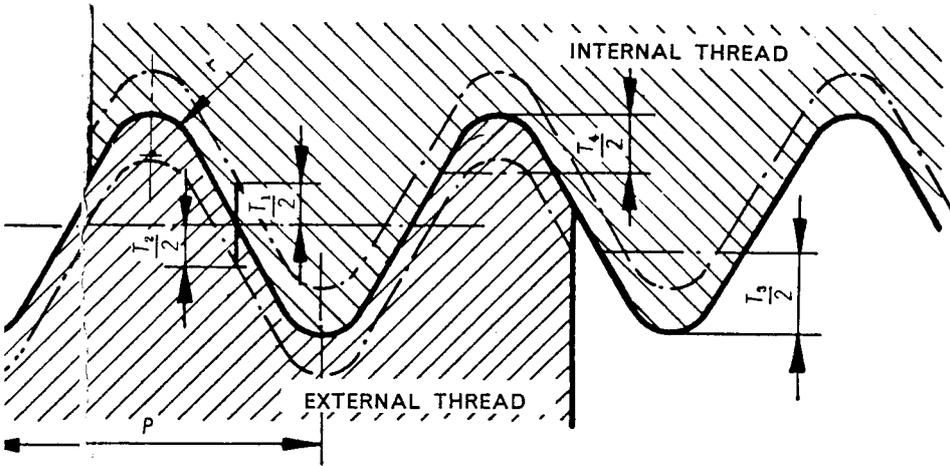


TABLE 1
 (values in inches)

7	8	9	10	11	12	13	14
Permissible tolerances on effective diameter*				Tolerance on the minor diameter		Tolerance on the major diameter	
read	External thread			Internal thread		External thread	
Upper deviation	Lower deviation Class A	Lower deviation Class B	Upper deviation	T ₃		T ₄	
in	in	in	in	Lower deviation in	Upper deviation in	Lower deviation in	Upper deviation in
+ 0.042	- 0.0042	- 0.0084	0	0	+ 0.0111	- 0.0084	0
+ 0.049	- 0.0049	- 0.0098	0	0	+ 0.0175	- 0.0098	0
+ 0.049	- 0.0049	- 0.0098	0	0	+ 0.0175	- 0.0098	0
+ 0.056	- 0.0056	- 0.0112	0	0	+ 0.0213	- 0.0112	0
+ 0.056	- 0.0056	- 0.0112	0	0	+ 0.0213	- 0.0112	0
+ 0.056	- 0.0056	- 0.0112	0	0	+ 0.0213	- 0.0112	0
+ 0.071	- 0.0071	- 0.0142	0	0	+ 0.0252	- 0.0142	0
+ 0.071	- 0.0071	- 0.0142	0	0	+ 0.0252	- 0.0142	0
+ 0.071	- 0.0071	- 0.0142	0	0	+ 0.0252	- 0.0142	0
+ 0.071	- 0.0071	- 0.0142	0	0	+ 0.0252	- 0.0142	0
+ 0.071	- 0.0071	- 0.0142	0	0	+ 0.0252	- 0.0142	0
+ 0.071	- 0.0071	- 0.0142	0	0	+ 0.0252	- 0.0142	0
+ 0.085	- 0.0085	- 0.0170	0	0	+ 0.0252	- 0.0170	0
+ 0.085	- 0.0085	- 0.0170	0	0	+ 0.0252	- 0.0170	0
+ 0.085	- 0.0085	- 0.0170	0	0	+ 0.0252	- 0.0170	0
+ 0.085	- 0.0085	- 0.0170	0	0	+ 0.0252	- 0.0170	0
+ 0.085	- 0.0085	- 0.0170	0	0	+ 0.0252	- 0.0170	0
+ 0.085	- 0.0085	- 0.0170	0	0	+ 0.0252	- 0.0170	0
+ 0.085	- 0.0085	- 0.0170	0	0	+ 0.0252	- 0.0170	0
+ 0.085	- 0.0085	- 0.0170	0	0	+ 0.0252	- 0.0170	0
+ 0.085	- 0.0085	- 0.0170	0	0	+ 0.0252	- 0.0170	0

* as to each other.

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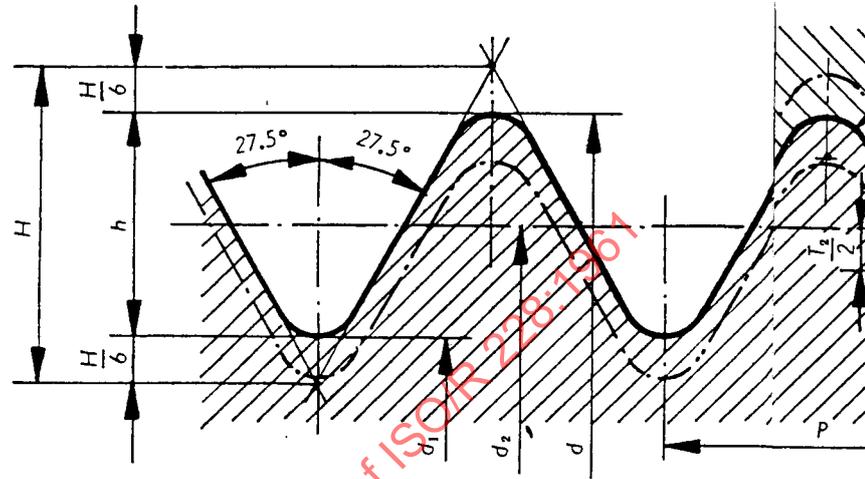
PIPE THREADS WHERE PRESSURE-TIGHT JOI

(1/8 INCH TO 6

$$H = 0.960\ 491 \times p$$

$$h = 0.640\ 327 \times p$$

$$r = 0.137\ 329 \times p$$



Nominal sizes inches	Number of threads per inch	Basic diameters			Possible to		
		major	effective	minor	Internal thread		
		<i>d</i>	<i>d₂</i>	<i>d₁</i>	<i>T₁</i>		
		mm	mm	mm	Lower deviation	Upper deviation	
						mm	mm
1/8	28	9.728	9.147	8.566	0	+ 0.7	
1/4	19	13.157	12.301	11.445	0	+ 0.5	
3/8	19	16.662	15.806	14.950	0	+ 0.5	
1/2	14	20.955	19.793	18.631	0	+ 0.2	
5/8	14	22.911	21.749	20.587	0	+ 0.2	
3/4	14	26.441	25.279	24.117	0	+ 0.2	
7/8	14	30.201	29.039	27.877	0	+ 0.2	
1	11	33.249	31.770	30.291	0	+ 0.0	
1 1/8	11	37.897	36.418	34.939	0	+ 0.0	
1 1/4	11	41.910	40.431	38.952	0	+ 0.0	
1 1/2	11	47.803	46.324	44.845	0	+ 0.0	
1 3/4	11	53.746	52.267	50.788	0	+ 0.0	
2	11	59.614	58.135	56.656	0	+ 0.0	
2 1/4	11	65.710	64.231	62.752	0	+ 0.7	
2 1/2	11	75.184	73.705	72.226	0	+ 0.7	
2 3/4	11	81.534	80.055	78.576	0	+ 0.7	
3	11	87.884	86.405	84.926	0	+ 0.7	
3 1/2	11	100.330	98.851	97.372	0	+ 0.7	
4	11	113.030	111.551	110.072	0	+ 0.7	
4 1/2	11	125.730	124.251	122.772	0	+ 0.7	
5	11	138.430	136.951	135.472	0	+ 0.7	
5 1/2	11	151.130	149.651	148.172	0	+ 0.7	
6	11	163.830	162.351	160.872	0	+ 0.7	

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