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ISO

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

ISO RECOMMENDATION
R7

PIPE THREADS
FOR GAS LIST TUBES AND SCREWED FITTINGS
WHERE PRESSURE-TIGHT JOINTS ARE MADE ON THE THREADS
(1/8 inch to 6 inches)

1st EDITION
May 1955

For each individual country the only valid standard is the national standard of that country.

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FOREWORD

This ISO Recommendation No 7 was prepared by Technical Committee ISO/TC 5—Pipes and Fittings—the Secretariat of which is held by the Association Suisse de Normalisation.

At its first meeting held in Zurich from 28 to 30 May, 1951, this Technical Committee resolved to take the dimensions of the British Standard B.S. 21: 1938 as the basis for threads for gas list tubes and fittings. This decision confirmed the resolution adopted in 1938 by Technical Committee ISA 5 b—Fittings—of the former International Federation of the National Standardizing Associations (ISA).

The study of a proposal was entrusted to Sub-Committee ISO/TC 5/SC 5—Fittings—the Secretariat of which is also held by the Association Suisse de Normalisation. This Sub-Committee met for the first time on 26 October 1951 and adopted the following resolution:

> "For the screw threads of gas list tubes and screwed fittings, Sub-Committee ISO/TC 5/SC 5 proposes to adopt a table made up as follows:
>
> 1. The drawings of the threads in the Standard B.S. 21: 1938, pages 5 and 6.
>
> 2. Column headings corresponding to those of columns 1 and 6 to 11 of table 1, page 8, and of columns 2 to 10 of table 3, page 10, of the Standard B.S. 21: 1938.
>
> 3. Numerical values (up to and including 6 inches only) converted into millimetres on the basis of 1 inch = 25.4 mm), these values to be rounded to the nearest thousandth of a millimetre, in the case of the diameters of the threads and to the nearest tenth of a millimetre for the linear dimensions."

In December 1951, a Draft Proposal based on the foregoing data was distributed to the Members of the Technical Committee. At its second plenary meeting held in Milan from 7 to 10 April 1952, the Technical Committee decided to adopt this Draft Proposal, with a few amendments, as a Draft ISO Recommendation.

This Draft ISO Recommendation (No 14) was submitted to all the ISO Member Bodies on 1 September, 1952, and was approved by the majority. Taking into consideration the observations made by various Member Bodies, Sub-Committee ISO/TC 5/SC 5 (at its Paris meeting of 17 and 18 September 1953) revised the text of the Draft, making certain modifications thereto.

This revised text, which corresponds to that of the present Recommendation, has been approved by the following 25 Member Bodies:

Australia	Hungary	New Zealand
Austria	India	Norway
Belgium	Ireland	Pakistan
Chile	Israel	Portugal
Denmark	Italy	Spain
Finland	Japan	Sweden
France	Mexico	Switzerland
Germany	Netherlands	United Kingdom
		Yugoslavia

The revised text of the Draft ISO Recommendation was submitted by correspondence to the Members of the ISO Council who, in May 1954, decided to accept it as an ISO RECOMMENDATION.

ISO Recommendation R 7 May 1954

PIPE THREADS FOR GAS LIST TUBES AND SCREWED FITTINGS WHERE PRESSURE-TIGHT JOINTS ARE MADE ON THE THREADS (1/8 inch to 6 inches)

A. SCOPE

The dimensions of the pipe threads given in Tables 1 and 2 relate to screwed tubes and to threads in cocks, valves and any fittings to be connected to screwed tubes.

B. DIMENSIONS

The dimensions shown in Table 1 have been taken from British Standard B.S.21: 1938 —"Pipe threads, Part I: Basic sizes and tolerances".

These dimensions have been converted into millimetres on the basis of 1 inch = 25.400 mm, beginning with the basic values, i.e. the number of threads per inch which determines the pitch p, the formula $h = 0.640327\ p$ (the depth of thread), and the major diameter at the gauge plane (gauge diameter), and are shown in Table 2.

The values in Table 2 for the pitch, the depth of thread and the major diameter at gauge plane are computed in ten-thousandths of a millimetre and rounded to the next thousandth of a millimetre. The effective diameter and the minor diameter are obtained by subtraction of the depth of thread from the major diameter at gauge plane:

$$\text{Col. } 6 = \text{Col. } 5 - \text{Col. } 4$$
$$\text{Col. } 7 = \text{Col. } 5 - 2 \times \text{Col. } 4$$

The basic gauge length, the tolerances and the fitting allowance are computed in hundredths of a millimetre and rounded to the next tenth of a millimetre.

The lengths in columns 11, 12, 15, 16 and 17 are obtained by addition or by subtraction of the basic gauge length and the tolerance of the gauge length or the fitting allowance respectively:

$$\text{Col. } 11 = \text{Col. } 8 + \text{Col. } 9$$
$$\text{Col. } 12 = \text{Col. } 8 - \text{Col. } 9$$
$$\text{Col. } 15 = \text{Col. } 8 + \text{Col. } 18$$
$$\text{Col. } 16 = \text{Col. } 11 + \text{Col. } 18$$
$$\text{Col. } 17 = \text{Col. } 12 + \text{Col. } 18$$

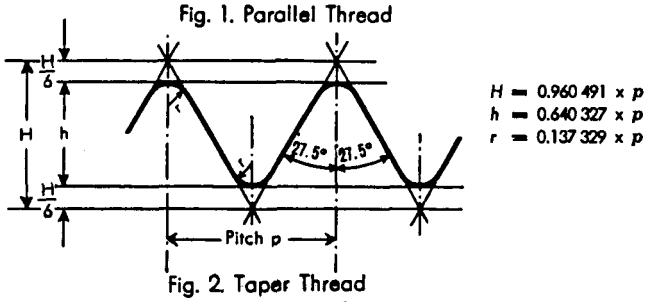
Bearing in mind that the lengths in the British Standard B.S. 21: 1938 are based on simple fractions of turns, and that the gauging practice operates with numbers of turns of thread, the limits of tolerance have been alternatively expressed in terms of actual linear dimensions in millimetres and of number of turns of thread.

Table 1 gives the dimensions in inches and Table 2 in millimetres.

Pipe Threads for Gas List Tubes and S
where Pressure-Tight Joints are made

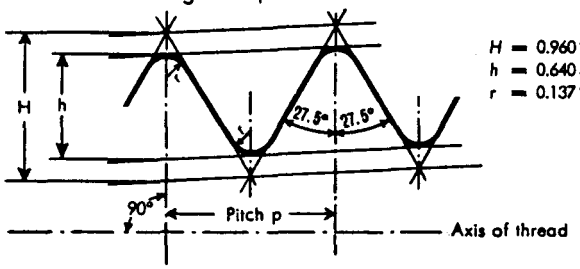
(1/8 inch to 6 inches)

Fig. 1. Parallel Thread



$H = 0.960\,491 \times p$
$h = 0.640\,327 \times p$
$r = 0.137\,329 \times p$

Fig. 2. Taper Thread



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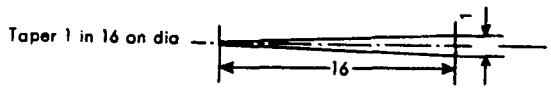

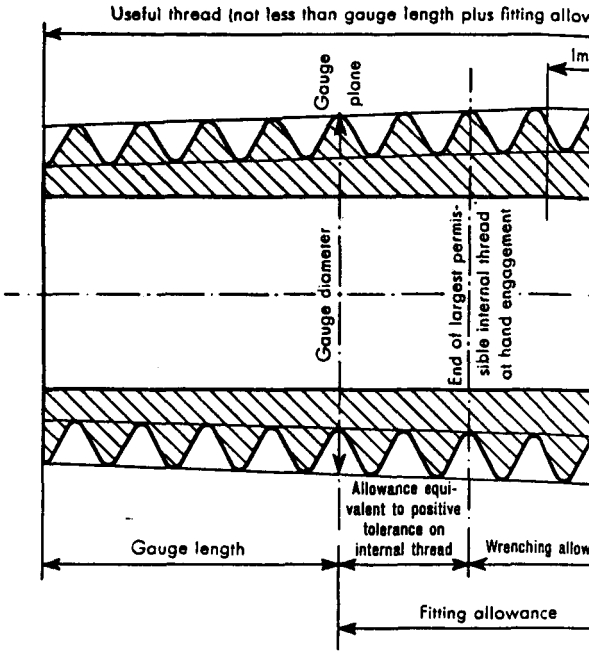

1	2	3	4	5	6	7	8
Nominal Bore of Tube (inches)	Number of Threads per inch	Pitch inches	Depth of Thread inches	Diameters at Gauge Plane (Basic) Major (Gauge Diameter) inches	Effective nches	Minor inches	Basic inches
1/8	28	0.03571	0.0229	0.383	0.3601	0.3372	0.1563
1/4	19	0.05263	0.0337	0.518	0.4843	0.4506	0.2367
3/8	19	0.05263	0.0337	0.656	0.6223	0.5886	0.2500
1/2	14	0.07143	0.0457	0.825	0.7793	0.7336	0.3214
3/4	14	0.07143	0.0457	1.041	0.9953	0.9496	0.3750
1	11	0.09091	0.0582	1.309	1.2508	1.1926	0.4091
1 1/4	11	0.09091	0.0582	1.650	1.5918	1.5336	0.5000
1 1/2	11	0.09091	0.0582	1.882	1.8238	1.7656	0.5000
2	11	0.09091	0.0582	2.347	2.2888	2.2306	0.6250
2 1/2	11	0.09091	0.0582	2.960	2.9018	2.8436	0.6875
3	11	0.09091	0.0582	3.460	3.4018	3.3436	0.8125
3 1/2	11	0.09091	0.0582	3.950	3.8918	3.8336	0.8750
4	11	0.09091	0.0582	4.450	4.3918	4.3336	1.0000
5	11	0.09091	0.0582	5.450	5.3918	5.3336	1.1250
6	11	0.09091	0.0582	6.450	6.3918	6.3336	1.1250

[1]) For parallel threaded couplings diametral tolerances equivalent to the length tolerances in columns 13 and 14 will apply (1/16 of the length to
[2]) The design of internally-threaded parts shall make allowance for receiving pipe ends up to the lengths given in column 16, and the minimum

l Screwed Fittings
ıe on the Threads

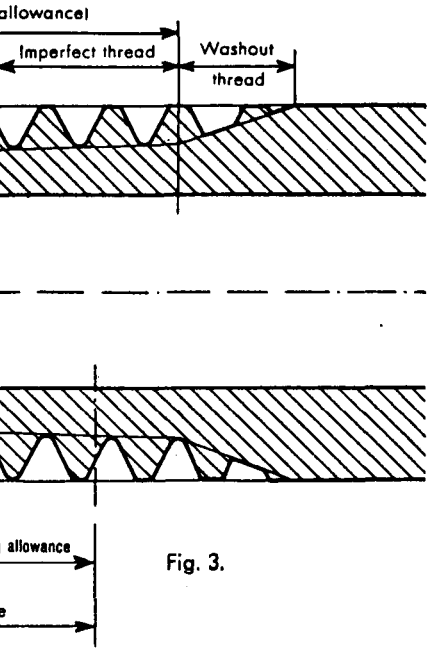

Fig. 3.

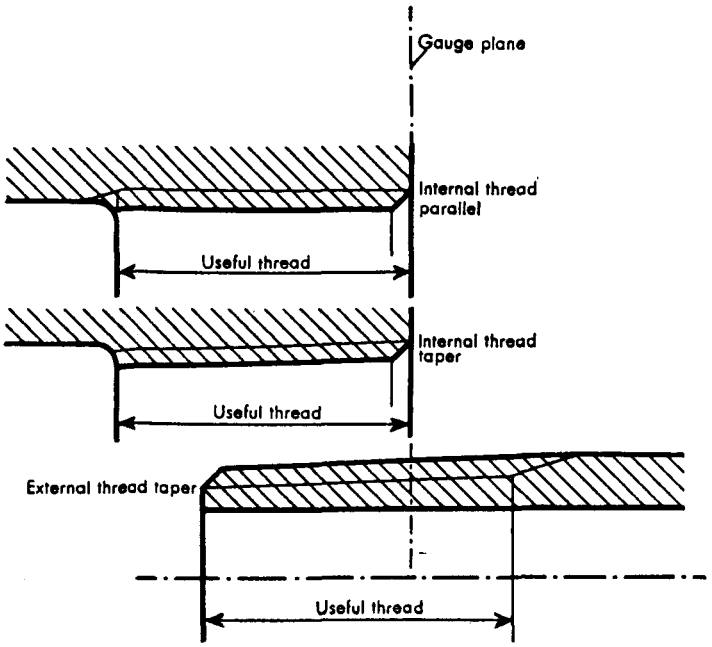

Fig. 4.

TABLE 1
(values in inches)

	9	10	11	12	13	14	15	16	17	18	19
	Gauge Length (Distance of Gauge Plane from Pipe End)				**Position of Gauge Plane on Internal Threads**		**Length of useful thread on Pipe End[2]) not less than :**			**Fitting Allowance**	
	Tolerance plus and minus		**Max.**	**Min.**	**Tolerance [1]) plus and minus**		**for Basic Gauge Length**	**for Max. Gauge Length**	**for Min. Gauge Length**		
	inches	**turns of thread**	**inches**	**inches**	**inches**	**turns of thread**	**inches**	**inches**	**inches**	**inches**	**turns of thread**
3	0.0357	1	0.1920	0.1206	0.0446	$1^1/_4$	0.2545	0.2902	0.2188	0.0982	$2^3/_4$
7	0.0526	1	0.2893	0.1841	0.0658	$1^1/_4$	0.3814	0.4340	0.3288	0.1447	$2^3/_4$
0	0.0526	1	0.3026	0.1974	0.0658	$1^1/_4$	0.3947	0.4473	0.3421	0.1447	$2^3/_4$
4	0.0714	1	0.3928	0.2500	0.0893	$1^1/_4$	0.5178	0.5892	0.4464	0.1964	$2^3/_4$
0	0.0714	1	0.4464	0.3036	0.0893	$1^1/_4$	0.5714	0.6428	0.5000	0.1964	$2^3/_4$
1	0.0909	1	0.5000	0.3182	0.1136	$1^1/_4$	0.6591	0.7500	0.5682	0.2500	$2^3/_4$
0	0.0909	1	0.5909	0.4091	0.1136	$1^1/_4$	0.7500	0.8409	0.6591	0.2500	$2^3/_4$
0	0.0909	1	0.5909	0.4091	0.1136	$1^1/_4$	0.7500	0.8409	0.6591	0.2500	$2^3/_4$
0	0.0909	1	0.7159	0.5341	0.1136	$1^1/_4$	0.9204	1.0113	0.8295	0.2954	$3^1/_4$
5	0.1364	$1^1/_2$	0.8239	0.5511	0.1364	$1^1/_2$	1.0511	1.1875	0.9147	0.3636	4
5	0.1364	$1^1/_2$	0.9489	0.6761	0.1364	$1^1/_2$	1.1761	1.3125	1.0397	0.3636	4
0	0.1364	$1^1/_2$	1.0114	0.7386	0.1364	$1^1/_2$	1.2386	1.3750	1.1022	0.3636	4
0	0.1364	$1^1/_2$	1.1364	0.8636	0.1364	$1^1/_2$	1.4091	1.5455	1.2727	0.4091	$4^1/_2$
0	0.1364	$1^1/_2$	1.2614	0.9886	0.1364	$1^1/_2$	1.5795	1.7159	1.4431	0.4545	5
0	0.1364	$1^1/_2$	1.2614	0.9886	0.1364	$1^1/_2$	1.5795	1.7159	1.4431	0.4545	5

th tolerances in column 13).
ıum length of useful thread shall be not less than 80 per cent of the values in column 17.

Pipe Threads for Gas List Tubes and where Pressure-Tight Joints are made

(1/8 inch to 6 inches)

Fig. 1. Parallel Thread

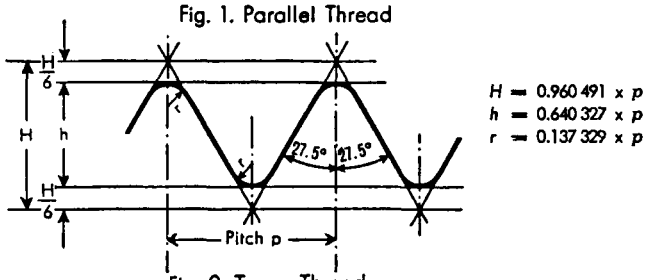

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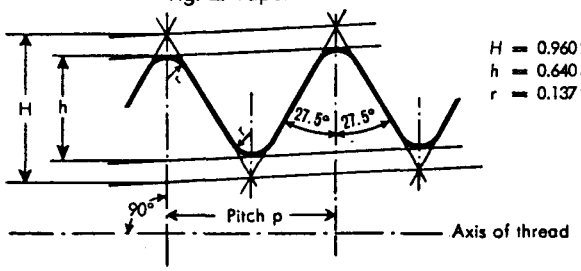
Fig. 2. Taper Thread



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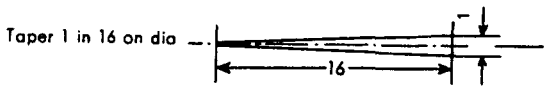

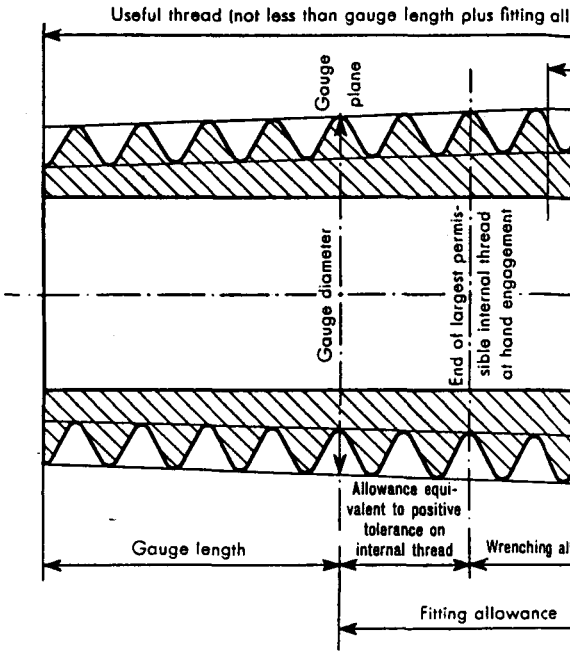

1	2	3	4	5	6	7	8
Nominal Bore of Tube	**Number of Threads per inch**	**Pitch**	**Depth of Thread**	**Diameters at Gauge Plane (Basic)**			
				Major (Gauge Diameter)	**Effective**	**Minor**	**Basic**
(inches)		**mm**	**mm**	**mm**	**mm**	**mm**	**mm**
1/8	28	0.907	0.581	9.728	9.147	8.566	4.0
1/4	19	1.337	0.856	13.157	12.301	11.445	6.0
3/8	19	1.337	0.856	16.662	15.806	14.950	6.4
1/2	14	1.814	1.162	20.955	19.793	18.631	8.2
3/4	14	1.814	1.162	26.441	25.279	24.117	9.5
1	11	2.309	1.479	33.249	31.770	30.291	10.4
1 1/4	11	2.309	1.479	41.910	40.431	38.952	12.7
1 1/2	11	2.309	1.479	47.803	46.324	44.845	12.7
2	11	2.309	1.479	59.614	58.135	56.656	15.9
2 1/2	11	2.309	1.479	75.184	73.705	72.226	17.5
3	11	2.309	1.479	87.884	86.405	84.926	20.6
3 1/2	11	2.309	1.479	100.330	98.851	97.372	22.2
4	11	2.309	1.479	113.030	111.551	110.072	25.4
5	11	2.309	1.479	138.430	136.951	135.472	28.6
6	11	2.309	1.479	163.830	162.351	160.872	28.6

[1]) For parallel threaded couplings diametral tolerances equivalent to the length tolerances in columns 13 and 14 will apply (1/16 of the length

[2]) The design of internally-threaded parts shall make allowance for receiving pipe ends up to the lengths given in column 16, and the minimu