
INTERNATIONAL STANDARD



3161

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

UNJ threads, with controlled root radius, for aerospace — Inch series

*Filetages UNJ, avec rayon à fond de filet contrôlé, pour applications aérospatiales —
Série en inches*

First edition — 1977-02-01

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FOREWORD

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO Member Bodies). The work of developing International Standards is carried out through ISO Technical Committees. Every Member Body interested in a subject for which a Technical Committee has been set up has the right to be represented on that Committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work.

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 3161 was drawn up by Technical Committee ISO/TC 20, *Aircraft and space vehicles*, and was circulated to the Member Bodies in May 1975.

It has been approved by the Member Bodies of the following countries :

Australia
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The Member Bodies of the following countries expressed disapproval of the document on technical grounds :

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3.2 Basic profile dimensions

In the following formulae :

P = pitch

H = height of fundamental triangle

n = number of threads per inch

$$H = \frac{\sqrt{3}}{2} \times P = 0.866\ 025\ P = \frac{0.866\ 025}{n}$$

$$\frac{9}{16} H = 0.487\ 14\ P = \frac{0.487\ 14}{n}$$

$$\frac{3}{8} H = 0.324\ 759\ P = \frac{0.324\ 759}{n}$$

$$\frac{5}{16} H = 0.270\ 63\ P = \frac{0.270\ 63}{n}$$

$$\frac{H}{8} = 0.108\ 25\ P = \frac{0.108\ 25}{n}$$

All these values are shown in table 1.

3.3 Basic dimensions of thread

3.3.1 Symbols

D = basic major diameter of internal thread

D_2 = basic pitch diameter of internal thread

D_1 = basic minor diameter of internal thread

d = basic major diameter of external thread

d_2 = basic pitch diameter of external thread

d_1 = basic minor diameter of external thread

H = height of fundamental triangle

$$P = \text{pitch} = \frac{1}{n}$$

$$n = \text{number of threads per inch} \left(n = \frac{1}{P} \right)$$

3.3.2 Values

Values shown in table 2 have been calculated according to the following formulae :

$$D_2 = D - \left(2 \times \frac{3}{8} H \right) = D - 0.649\ 519\ P = D - \frac{0.649\ 519}{n}$$

$$d_2 = d - \left(2 \times \frac{3}{8} H \right) = d - 0.649\ 519\ P = d - \frac{0.649\ 519}{n}$$

$$D_1 = D - \left(2 \times \frac{9}{16} H \right) = D - 0.974\ 28\ P = D - \frac{0.974\ 28}{n}$$

$$d_1 = d - \left(2 \times \frac{9}{16} H \right) = d - 0.974\ 28\ P = d - \frac{0.974\ 28}{n}$$

4 SERIES OF THREADS

This International Standard includes various series of threads; i.e. groups of diameter/pitch combinations distinguished from each other by the number of threads per inch associated with any given thread diameter. These series of threads are given in table 3.

4.1 Diameters

Columns 1 and 2 of table 3 give the primary and secondary series nominal sizes which satisfy current requirements.

4.2 Number of threads per inch

Columns 3 to 8 inclusive of table 3 give the numbers of threads per inch which are recommended to be associated with the diameters in columns 1 and 2. These columns of the numbers of threads per inch are divided into two groups :

- Series with increasing pitches : columns 3, 4 and 5
- Constant (uniform) pitch series : columns 6, 7 and 8

4.2.1 Series with increasing pitches

There are three series of increasing pitches. They are headed "Coarse pitch", "Fine pitch" and "Extra fine pitch" in accordance with current practice.

These terms indicate the relative pitches of the three series for each given thread diameter and do not imply a difference in quality between the series.

4.2.2 Constant (uniform) pitch series

In addition to these three series of increasing pitches, the table includes details of constant pitch series which have been selected from the range of 8 to 16 threads per inch. Each of these series is limited to an appropriate range of diameters.

5 DESIGNATION OF THREADS

Threads shall be designated as shown in 5.1 and 5.2 by indicating, in sequence, the nominal size, the number of threads per inch, the thread series symbol and the thread class symbol.

The thread designation is indicated at the head of each column in table 3, with the addition of the thread class (3A : external thread, 3B : internal thread).

5.1 Thread designation with increasing pitches

	Designation
Coarse pitch series - External thread :	UNJC - 3A
Fine pitch series - External thread :	UNJF - 3A
Extra fine pitch series - External thread :	UNJEF - 3A
Coarse pitch series - Internal thread :	UNJC - 3B
Fine pitch series - Internal thread :	UNJF - 3B

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Extra fine pitch series – Internal thread : **UNJEF – 3B**

Example : **0.2500 – 28 UNJF – 3A** : External thread, basic diameter 0.250 0 in, 28 threads per inch, UNJF – 3A thread.

5.2 Constant pitch series

The diameter/pitch combinations of threads of the constant pitch series are all designated by the three letters UNJ followed by the class of thread (3A : external thread; 3B : internal thread).

Examples :

3.500 – 12 UNJ – 3B : Internal thread, basic diameter 3.500 in, constant series, 12 threads per inch, UNJ – 3B thread class.

3.500 – 12 UNJ – 3B – LH : Internal thread, basic diameter 3.500 in, constant series, 12 threads per inch, UNJ – 3B thread class, left-hand thread.

6 TOLERANCES

6.1 Length of thread engagement used in computing tolerances

The length of thread engagement (L_e) when engaged is equal to :

- the basic major diameter for the series UNJC, UNJF and 8 UNJ;

- 9 P for the series UNJEF, 12 UNJ and 16 UNJ.

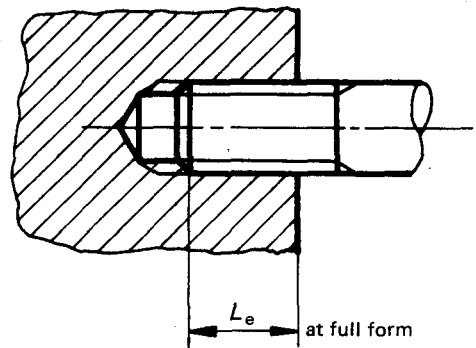


FIGURE 2 – Length of engagement

6.2 Position of tolerances

The tolerances are positive (+) for the internal threads and negative (-) for the external threads (that is, the tolerances are applied in the direction of minimum material).

6.2.1 Internal thread

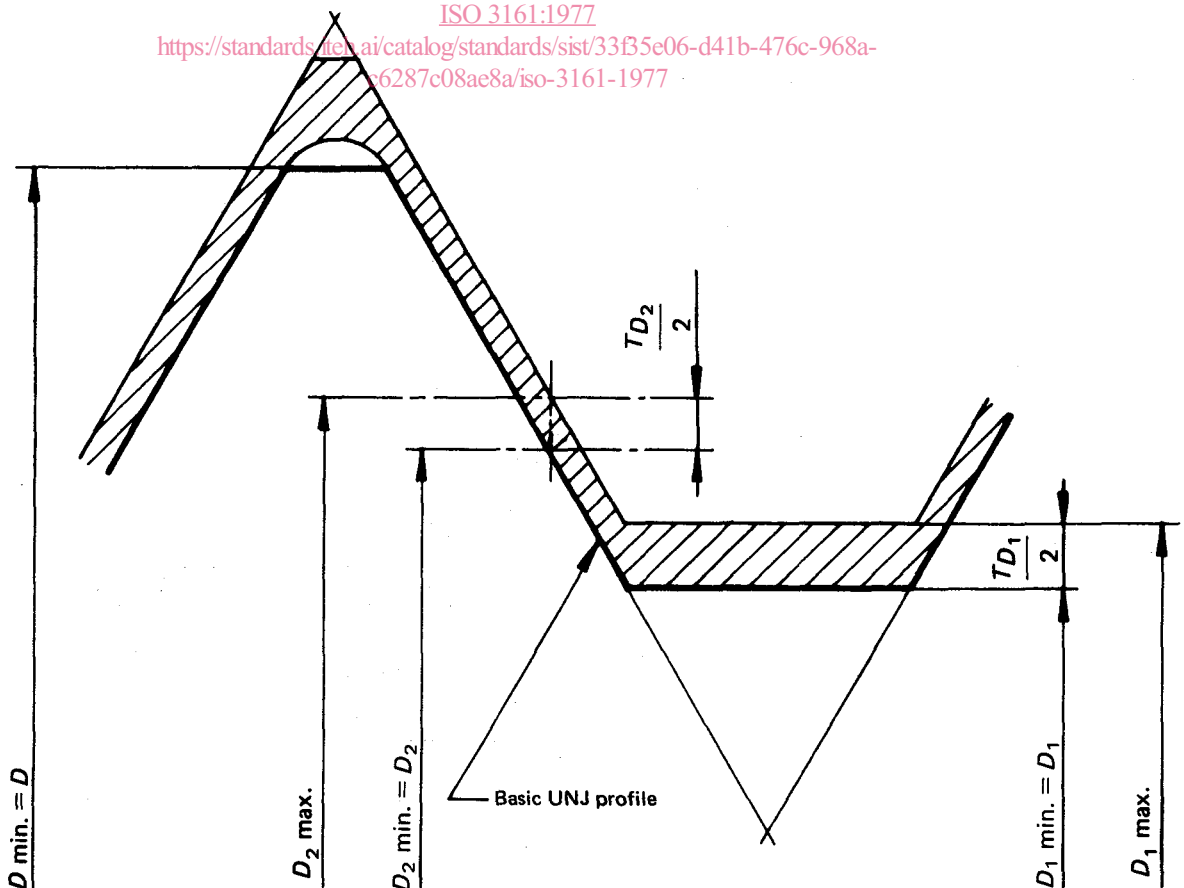


FIGURE 3 – Internal thread tolerances

6.2.2 External thread

6.3 Values of tolerances for profile dimensions and tolerances of the profile form

Values indicated in tables 4, 5, 6, 7 and 8 have been calculated according to the formulae given in 6.3.1, and are based on the length of engagement equal to that shown in clause 6, where

- α is the basic half-angle of the thread;
- $\delta\alpha$ is the maximum permissible deviation of the half-angle;
- T_{D_2} and T_{d_2} are the pitch diameter tolerances;
- δP is the maximum permissible pitch deviation between any two of the threads engaged;
- δD_2 is the pitch diameter increment due to lead deviation for the internal threads;
- $\delta D_2'$ is the pitch diameter increment due to deviations in the half-angles for the internal threads;
- δd_2 is the pitch diameter increment due to lead deviation for the external threads;
- $\delta d_2'$ is the pitch diameter increment due to deviations in the half-angles for the external threads;

6.3.1 Calculation formulae

$$d \text{ max.} = d$$

$$d \text{ min.} = d \text{ max.} - 0.060 \sqrt[3]{P^2}$$

$$d_2 \text{ max.} = d \text{ max.} - 0.649 519 P = d_2$$

$$d_2 \text{ min.} = d_2 \text{ max.} - 0.750 (0.001 5 \sqrt[3]{d} + 0.001 5 \sqrt{L_e} + 0.015 \sqrt[3]{P^2})$$

$$d_3 \text{ max.} = d_2 \text{ max.} - 0.505 18 P = d_3$$

$$d_3 \text{ min.} = d_2 \text{ min.} - 0.565 80 P$$

$$R \text{ max.} = 0.180 42 P$$

$$R \text{ min.} = 0.150 11 P$$

$$D \text{ max.} = D_2 \text{ max.} + 0.793 86 P$$

$$D \text{ min.} = D$$

$$D_2 \text{ max.} = D_2 \text{ min.} + 0.975 (0.001 5 \sqrt[3]{d} + 0.001 5 \sqrt{L_e} + 0.001 5 \sqrt[3]{P^2})$$

$$D_2 \text{ min.} = D \text{ min.} - 0.649 519 P = D_2$$

$$D_1 \text{ max.} = D_1 \text{ min.} + T_{D_1}$$

$$T_{D_1} = (0.05 \sqrt[3]{P^2} + 0.03 P/d) - 0.002$$

with $0.135 315 P < T_{D_1} < 0.259 809 P$ for threads with more than 12 threads per inch
and $T_{D_1} = 0.120 P$ for threads with 12 threads per inch or less.

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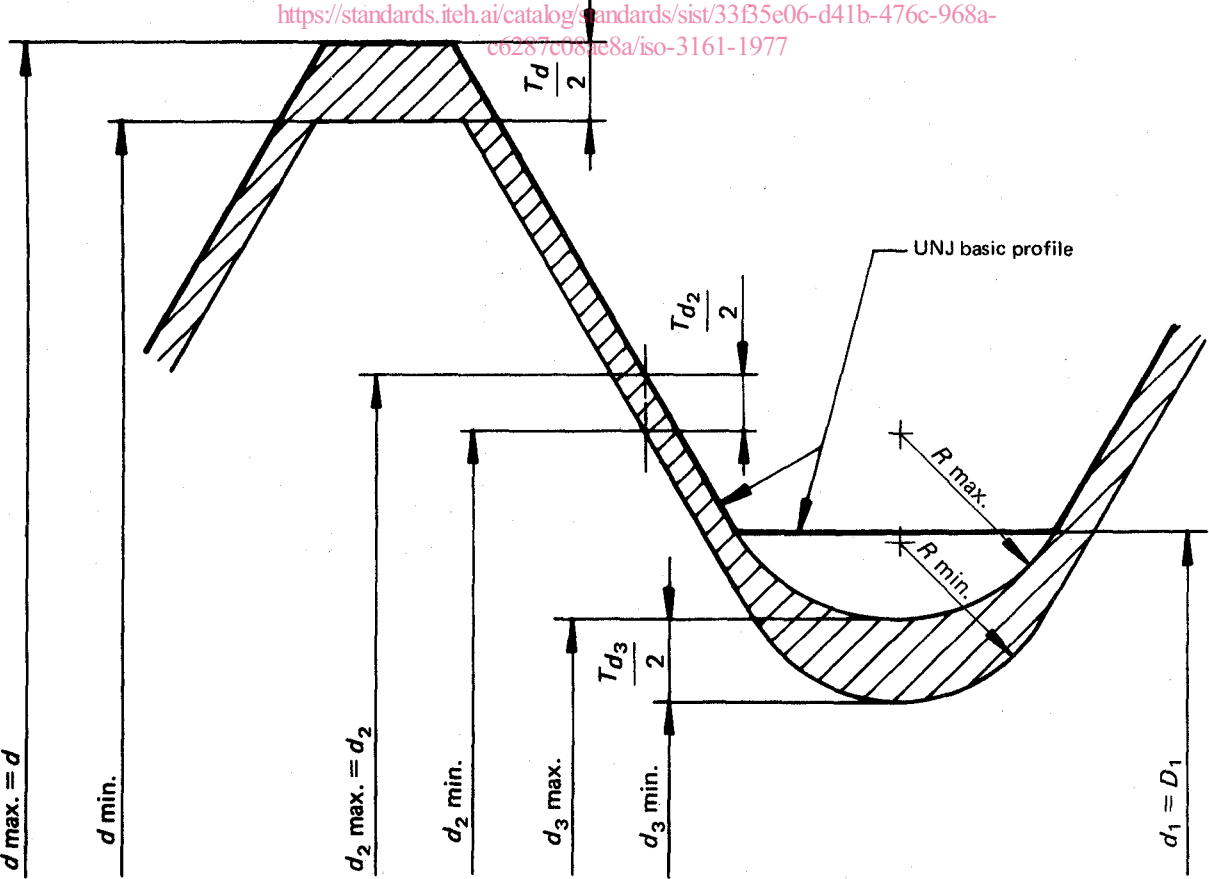


FIGURE 4 – External thread tolerances

$D_1 \text{ min.} = D - 0.974\ 28\ P$ rounded upwards to the fourth decimal place, unless the fifth figure is zero.

$$\delta P = \frac{\delta D_2}{\cot \alpha} = \frac{\delta D_2}{1.732\ 1} = \frac{0.4\ T_{D_2}}{1.732\ 1} \text{ for internal threads}$$

$$\delta P = \frac{\delta d_2}{\cot \alpha} = \frac{\delta d_2}{1.732\ 1} = \frac{0.4\ T_{d_2}}{1.732\ 1} \text{ for external threads}$$

$$\tan \delta \alpha = \frac{\delta D_2'}{1.5\ P} = \frac{0.4\ T_{D_2}}{1.5\ P} \text{ for internal threads}$$

$$\tan \delta \alpha = \frac{\delta d_2'}{1.5\ P} = \frac{0.4\ T_{d_2}}{1.5\ P} \text{ for external threads}$$

6.3.2 Root radius of the thread

6.3.2.1 INTERNAL THREADS

For internal threads, the profile of the actual root of the thread shall at no point be below the basic profile given in figure 3. No particular radius is specified.

6.3.2.2 EXTERNAL THREADS

For external threads, the profile of the actual root of the thread shall lie within the root radius tolerance zone shown in figure 5. The limit values of the root radius R are specified in table 4. The profile shall be a continuous blended curve, no part of which shall have a radius of less than $0.150\ 11\ P$ and which is tangential to the thread flanks at

not less than $0.562\ 5\ H$ thread depth. The profile may comprise tangent flank radii that are joined by a tangential flat at the root.

6.4 Special case for coated threads

The thread is, when required, protected by applying a metal coating or a layer of solid lubricant.

6.4.1 External threads

Where the external threads are intended to be coated, the minimum value of the pitch diameter of the thread may be reduced by 0.001 in maximum for threads with a tolerance for the pitch diameter of the thread of less than 0.003 5 in in table 5.

For threads with a tolerance for the minimum pitch diameter of the thread of more than 0.003 5 in, the value of the pitch diameter of the thread may be reduced by 0.3 times the tolerance of the pitch diameter of the thread, but this reduction shall not exceed 0.001 5 in. The maximum limits for the dimensions of the threads of coated screws shall be in accordance with the values given in this International Standard.

6.4.2 Internal threads

Where the internal threads are intended to be coated, the maximum value of the pitch diameter of the thread may be increased in the same way as specified in 6.4.1 for the reduction of the minimum pitch diameter of the external thread. The minimum limits of the dimensions of the coated internal threads shall be in accordance with the values given in this International Standard.

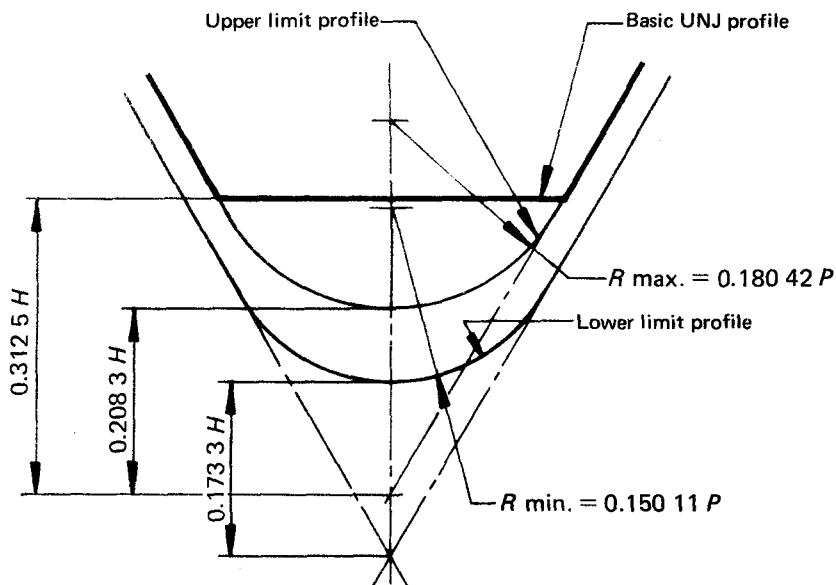


FIGURE 5 – Radius at the root of the screw thread

7 GAUGING BY LIMIT GAUGES¹⁾

7.1 Gauging of internal threads

For checking the internal threads, threaded gauges of the GO and NOT-GO type shall be used.

To check the minor diameter of the internal threads, plug gauges of the GO and NOT-GO type shall be used.

7.2 Gauging of external threads

For checking the maximum limits of the material, a thread GO ring gauge of a properly calibrated dial gauge shall be used.

Thread dial gauges or reference gauges (with shortened flanks and properly calibrated) shall be used to check the minimum limits of the material of the pitch diameter.

Measuring instruments or reference gauges, properly calibrated, shall be used to check the deviations in the pitch diameter due both to the lead error and to errors of the half-angles, also the uniformity of the distribution of these errors, the lead errors and concentricity defects.

Snap gauges, indicating gauges, or a measuring instrument shall be used to check the major diameter.

7.3 Root radius

The radius of the thread root shall be checked by an optical method.

The minor diameter of the thread shall be checked using flange gauges or dial gauges (properly calibrated), by measuring instruments or by optical procedures.

8 TABLES

Tables are provided which specify inch dimensions and corresponding metric equivalents. All thread designations are specified in inch units. The conversion procedure adopted for obtaining the metric values in the tables was to multiply the inch values by 25,4. The resultant values were rounded to be within the inch product limits.

Table 1 gives the inch dimensions of basic profile.

Table 2 specifies the basic dimensions in inches (with metric conversions).

Table 3 gives the preferred selection of diameter/pitch combinations. It is recommended that usage be restricted to the primary sizes indicated.

Table 4 gives the limit values of the root radius in inches (with metric conversions).

Table 5 and 6 specify the values of tolerances for profile dimensions in inches (with metric conversions).

Tables 7 and 8 specify the maximum permissible deviations in the half-angle and the lead error in inches (with metric conversions).

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¹⁾ The gauges used shall be in accordance with the appropriate International Standard (to be prepared).

TABLE 1 — Basic profile

Dimensions in inches¹⁾

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Number of threads per inch	Pitch $P = \frac{1}{n}$	$\frac{P}{2}$ 0.5 P	$\frac{5}{16}P$ 0.312 5 P	$\frac{P}{8}$ 0.125 P	H	$\frac{9}{16}H$ 0.487 14 P	$\frac{3}{8}H$ 0.324 76 P	$\frac{5}{16}H$ 0.270 63 P	$\frac{H}{8}$ 0.108 25 P
80	0.012 500	0.006 250	0.003 91	0.001 56	0.010 825	0.006 09	0.004 06	0.003 38	0.001 35
72	0.013 889	0.006 944	0.004 34	0.001 74	0.012 028	0.006 77	0.004 51	0.003 76	0.001 50
64	0.015 625	0.007 812	0.004 88	0.001 95	0.013 532	0.007 61	0.005 07	0.004 23	0.001 69
56	0.017 857	0.008 928	0.005 58	0.002 23	0.015 465	0.008 70	0.005 80	0.004 83	0.001 93
48	0.020 833	0.010 416	0.006 51	0.002 60	0.018 042	0.010 15	0.006 77	0.005 64	0.002 26
44	0.022 727	0.011 363	0.007 10	0.002 84	0.019 682	0.011 07	0.007 38	0.006 15	0.002 46
40	0.025 000	0.012 500	0.007 81	0.003 12	0.021 651	0.012 18	0.008 12	0.006 77	0.002 71
36	0.027 778	0.013 889	0.008 68	0.003 47	0.024 056	0.013 53	0.009 02	0.007 52	0.003 01
32	0.031 250	0.015 625	0.009 77	0.003 91	0.027 063	0.015 22	0.010 15	0.008 46	0.003 38
28	0.035 714	0.017 857	0.011 16	0.004 46	0.030 929	0.017 40	0.011 60	0.009 67	0.003 87
24	0.041 667	0.020 833	0.013 02	0.005 21	0.036 084	0.020 30	0.013 53	0.011 28	0.004 51
20	0.050 000	0.025 000	0.015 62	0.006 25	0.043 301	0.024 36	0.016 24	0.013 53	0.005 41
18	0.055 556	0.027 778	0.017 36	0.006 94	0.048 113	0.027 06	0.018 04	0.015 04	0.006 01
16	0.062 500	0.031 250	0.019 53	0.007 81	0.054 127	0.030 45	0.020 30	0.016 91	0.006 77
14	0.071 429	0.035 714	0.022 32	0.008 93	0.061 859	0.034 80	0.023 20	0.019 33	0.007 73
13	0.076 923	0.038 461	0.024 04	0.009 62	0.066 617	0.037 47	0.024 98	0.020 82	0.008 33
12	0.083 333	0.041 666	0.026 04	0.010 42	0.072 169	0.040 59	0.027 06	0.022 55	0.009 02
11	0.090 909	0.045 454	0.028 41	0.011 36	0.078 730	0.044 29	0.029 52	0.024 60	0.009 84
10	0.100 000	0.050 000	0.031 25	0.012 50	0.086 603	0.048 71	0.032 48	0.027 06	0.010 83
9	0.111 111	0.055 555	0.034 72	0.013 89	0.096 225	0.054 13	0.036 08	0.030 07	0.012 03
8	0.125 000	0.062 500	0.039 06	0.015 62	0.108 253	0.060 89	0.040 59	0.033 83	0.013 53
7	0.142 857	0.071 428	0.044 64	0.017 86	0.123 718	0.069 59	0.046 39	0.038 66	0.015 46
6	0.166 667	0.083 333	0.052 08	0.020 83	0.144 338	0.081 19	0.054 13	0.045 10	0.018 04
5	0.200 000	0.100 000	0.062 50	0.025 00	0.173 205	0.097 43	0.064 95	0.054 13	0.021 65
4.5	0.222 222	0.111 111	0.069 44	0.027 78	0.192 450	0.108 25	0.072 17	0.060 14	0.024 06
4	0.250 000	0.125 000	0.078 12	0.031 25	0.216 506	0.121 78	0.081 19	0.067 66	0.027 06

1) In order to obtain the corresponding values in millimetres, multiply the values in inches by the factor 25.4.

TABLE 2 — Basic dimensions (Inches)

Dimensions in inches

(1)	(2)	(3)	(4)	(5)
Nominal sizes	Number of threads per inch <i>n</i>	Major diameter <i>D, d</i>	Pitch diameter <i>D₂, d₂</i>	Minor diameter <i>D₁, d₁</i>
0.060 0	80	0.060 0	0.051 9	0.047 9
0.073 0	72 64	0.073 0	0.064 0 0.062 9	0.059 5 0.057 8
0.086 0	64 56	0.086 0	0.075 9 0.074 4	0.070 8 0.068 6
0.099 0	56 48	0.099 0	0.087 4 0.085 5	0.081 6 0.078 7
0.112 0	48 40	0.112 0	0.098 5 0.095 8	0.091 7 0.087 7
0.125 0	44 40	0.125 0	0.110 2 0.108 8	0.102 9 0.100 7
0.138 0	40 32	0.138 0	0.121 8 0.117 7	0.113 7 0.107 6
0.164 0	36 32	0.164 0	0.146 0 0.143 7	0.137 0 0.133 6
0.190 0	32 24	0.190 0	0.169 7 0.162 9	0.159 6 0.149 4
0.216 0	32 28 24	0.216 0	0.195 7 0.192 8 0.188 9	0.185 6 0.181 2 0.175 4
0.250 0	32 28 20	0.250 0	0.229 7 0.226 8 0.217 5	0.219 6 0.215 2 0.201 3
0.312 5	32 24 18	0.312 5	0.292 2 0.285 4 0.276 4	0.282 1 0.271 9 0.258 4
0.375 0	32 24 16	0.375 0	0.354 7 0.347 9 0.334 4	0.344 6 0.334 4 0.314 2
0.437 5	28 20 16 14	0.437 5	0.414 3 0.405 0 0.396 9 0.391 1	0.402 7 0.388 8 0.376 7 0.368 0
0.500 0	28 20 16 13	0.500 0	0.476 8 0.467 5 0.459 4 0.450 0	0.465 2 0.451 3 0.439 2 0.425 1
0.562 5	24 18 16 12	0.562 5	0.535 4 0.526 4 0.521 9 0.508 4	0.521 9 0.508 4 0.501 7 0.481 4

(1)	(2)	(3)	(4)	(5)
Nominal sizes	Number of threads per inch <i>n</i>	Major diameter <i>D, d</i>	Pitch diameter <i>D₂, d₂</i>	Minor diameter <i>D₁, d₁</i>
0.625 0	24 18 16 12 11	0.625 0	0.597 9 0.588 9 0.584 4 0.570 9 0.566 0	0.584 4 0.570 9 0.564 2 0.543 9 0.536 5
0.687 5	24 16 12	0.687 5	0.660 4 0.646 9 0.633 4	0.646 9 0.626 7 0.606 4
0.750 0	20 16 12 10	0.750 0	0.717 5 0.709 4 0.695 9 0.685 0	0.701 3 0.689 2 0.668 9 0.652 6
0.812 5	20 16 12	0.812 5	0.780 0 0.771 9 0.758 4	0.763 8 0.751 7 0.731 4
0.875 0	20 16 14 12 10	0.875 0	0.842 5 0.834 4 0.828 6 0.820 9 0.802 8	0.826 3 0.814 2 0.805 5 0.793 9 0.766 8
0.937 5	20 16 12	0.937 5	0.905 0 0.896 9 0.883 4	0.888 8 0.876 7 0.856 4
1.000 0	20 16 12 8	1.000 0	0.967 5 0.959 4 0.945 9 0.918 8	0.951 3 0.939 2 0.918 9 0.878 3
1.062 5	18 16 12 8	1.062 5	1.026 4 1.021 9 1.008 4 0.981 3	1.008 4 1.001 7 0.981 4 0.940 8
1.125 0	18 16 12 8 7	1.125 0	1.088 9 1.084 4 1.070 9 1.043 8 1.032 2	1.070 9 1.064 2 1.043 9 1.003 3 0.985 9
1.187 5	18 16 12 8	1.187 5	1.151 4 1.146 9 1.133 4 1.106 3	1.133 4 1.126 7 1.106 4 1.065 8
1.250 0	18 16 12 8 7	1.250 0	1.213 9 1.209 4 1.195 9 1.168 8 1.157 2	1.195 9 1.189 2 1.168 9 1.128 3 1.110 9

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TABLE 2 – Basic dimensions (Metric conversions)

(1)	(2)	(3)	(4)	(5)
Nominal sizes	Number of threads per inch	Major diameter	Pitch diameter	Minor diameter
in	<i>n</i>	<i>D, d</i> mm	<i>D₂, d₂</i> mm	<i>D₁, d₁</i> mm
0.060 0	80	1,524	1,318	1,217
0.073 0	72	1,854	1,625	1,511
	64		1,597	1,468
0.086 0	64	2,184	1,927	1,798
	56		1,889	1,742
0.099 0	56	2,514	2,219	2,073
	48		2,171	1,999
0.112 0	48	2,844	2,501	2,329
	40		2,433	2,228
0.125 0	44	3,175	2,799	2,614
	40		2,763	2,558
0.138 0	40	3,505	3,093	2,888
	32		2,989	2,733
0.164 0	36	4,165	3,708	3,480
	32		3,649	3,393
0.190 0	32	4,826	4,310	4,054
	24		4,137	3,795
0.216 0	32	5,486	4,970	4,714
	28		4,897	4,602
	24		4,798	4,445
0.250 0	32	6,350	5,834	5,578
	28		5,760	5,466
	20		5,524	5,113
0.312 5	32	7,937	7,421	7,165
	24		7,249	6,096
	18		7,020	6,563
0.375 0	32	9,525	9,009	8,753
	24		8,836	8,494
	16		8,493	7,981
0.437 5	28	11,112	10,523	10,228
	20		10,287	9,876
	16		10,081	9,568
	14		9,933	9,347
0.500 0	28	12,700	12,111	11,816
	20		11,874	11,463
	16		11,669	11,156
	13		11,430	10,798
0.562 5	24	14,287	13,599	13,256
	18		13,370	12,913
	16		13,256	12,744
	12		12,913	12,228

(1)	(2)	(3)	(4)	(5)
Nominal sizes	Number of threads per inch	Major diameter	Pitch diameter	Minor diameter
in	<i>n</i>	<i>D, d</i> mm	<i>D₂, d₂</i> mm	<i>D₁, d₁</i> mm
0.625 0	24	15,875	15,186	14,844
	18		14,958	14,501
	16		14,843	14,331
	12		14,500	13,816
0.687 5	11	17,462	14,376	13,627
	24		16,774	16,431
	16		16,431	15,919
0.750 0	12	19,050	16,088	15,403
	20		18,224	17,813
	16		18,018	17,506
0.812 5	12	20,637	17,675	16,991
	10		17,399	16,571
	20		19,812	19,400
	16		19,606	19,094
0.875 0	12	22,225	19,263	18,578
	20		21,399	20,998
	16		21,193	20,681
0.937 5	14	23,812	21,046	20,460
	12		20,850	20,166
	9		20,391	19,477
	16		22,781	22,269
1.000 0	12	25,400	22,438	21,753
	8		23,337	22,309
	20		24,574	24,163
	16		24,368	23,856
1.062 5	12	26,987	24,025	23,340
	8		23,337	22,309
	18		26,070	25,410
	16		25,956	25,444
1.125 0	12	28,575	25,613	24,928
	8		24,925	23,896
	18		27,658	27,191
	16		27,543	27,031
1.187 5	12	30,162	27,200	26,515
	8		26,512	25,484
	7		26,217	25,042
	18		29,245	28,788
1.250 0	16	31,750	29,131	28,619
	12		28,788	28,103
	8		28,100	27,071
	18		30,833	30,376
1.250 0	16	31,750	30,718	30,206
	12		30,375	29,690
	8		29,687	28,659
	7		29,392	28,217

TABLE 2 – (continued)

Dimensions in inches

(1)	(2)	(3)	(4)	(5)
Nominal sizes	Number of threads per inch <i>n</i>	Major diameter <i>D, d</i>	Pitch diameter <i>D₂, d₂</i>	Minor diameter <i>D₁, d₁</i>
1.312 5	18	1.312 5	1.276 4	1.258 4
	16		1.271 9	1.251 7
	12		1.258 4	1.231 4
	8		1.231 3	1.190 8
1.375 0	18	1.375 0	1.338 9	1.320 9
	16		1.334 4	1.314 2
	12		1.320 9	1.293 9
	8		1.293 8	1.253 3
	6		1.266 7	1.212 7
1.437 5	18	1.437 5	1.401 4	1.383 4
	16		1.396 9	1.376 7
	12		1.383 4	1.356 4
	8		1.356 3	1.315 8
1.500 0	18	1.500 0	1.463 9	1.445 9
	16		1.459 4	1.439 2
	12		1.445 9	1.418 9
	8		1.418 8	1.378 3
	6		1.391 7	1.337 7
1.562 5	18	1.562 5	1.526 4	1.508 4
	16		1.521 9	1.501 7
	12		1.508 4	1.481 4
	8		1.481 3	1.440 8
1.625 0	18	1.625 0	1.588 9	1.570 9
	16		1.584 4	1.564 2
	12		1.570 9	1.543 9
	8		1.543 8	1.503 3
1.687 5	18	1.687 5	1.651 4	1.633 4
	16		1.646 9	1.626 7
	12		1.633 4	1.606 4
	8		1.606 3	1.565 8
1.750 0	16	1.750 0	1.709 4	1.689 2
	12		1.695 9	1.668 9
	8		1.668 8	1.628 3
	5		1.620 1	1.555 2
1.812 5	16	1.812 5	1.771 9	1.751 7
	12		1.758 4	1.731 4
	8		1.731 3	1.690 8
1.875 0	16	1.875 0	1.834 4	1.814 2
	12		1.820 9	1.793 9
	8		1.793 8	1.753 3
1.937 5	16	1.937 5	1.896 9	1.876 7
	12		1.883 4	1.856 4
	8		1.856 3	1.815 8
2.000 0	16	2.000 0	1.959 4	1.939 2
	12		1.945 9	1.918 9
	8		1.918 8	1.878 3
	4,5		1.855 7	1.783 5

(1)	(2)	(3)	(4)	(5)
Nominal sizes	Number of threads per inch <i>n</i>	Major diameter <i>D, d</i>	Pitch diameter <i>D₂, d₂</i>	Minor diameter <i>D₁, d₁</i>
2.125 0	16	2.125 0	2.084 4	2.064 2
	12		2.070 9	2.043 9
	8		2.043 8	2.003 3
2.250 0	16	2.250 0	2.209 4	2.189 2
	12		2.195 9	2.168 9
	8		2.168 8	2.128 3
	4,5		2.105 7	2.033 5
2.375 0	16	2.375 0	2.334 4	2.314 2
	12		2.320 9	2.293 9
	8		2.293 8	2.253 3
2.500 0	16	2.500 0	2.459 4	2.439 2
	12		2.445 9	2.418 9
	8		2.418 8	2.378 3
	4		2.337 6	2.256 5
2.625 0	16	2.625 0	2.584 4	2.564 2
	12		2.570 9	2.543 9
	8		2.543 8	2.503 3
2.750 0	16	2.750 0	2.709 4	2.689 2
	12		2.695 9	2.668 9
	8		2.668 8	2.628 3
	4		2.587 6	2.506 5
2.875 0	16	2.875 0	2.834 4	2.814 2
	12		2.820 9	2.793 9
	8		2.793 8	2.753 3
3.000 0	16	3.000 0	2.959 4	2.939 2
	12		2.945 9	2.918 9
	8		2.918 8	2.878 3
	4		2.837 6	2.756 5
3.125 0	16	3.125 0	3.084 4	3.064 2
	12		3.070 9	3.043 9
	8		3.043 8	3.003 3
3.250 0	16	3.250 0	3.209 4	3.189 2
	12		3.195 9	3.168 9
	8		3.168 8	3.128 3
	4		3.087 6	3.006 5
3.375 0	16	3.375 0	3.334 4	3.314 2
	12		3.320 9	3.293 9
	8		3.293 8	3.253 3
3.500 0	16	3.500 0	3.459 4	3.439 2
	12		3.445 9	3.418 9
	8		3.418 8	3.378 3
	4		3.337 6	3.256 5
3.625 0	16	3.625 0	3.584 4	3.564 2
	12		3.570 9	3.543 9
	8		3.543 8	3.503 3

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TABLE 2 — (continued)

(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
Nominal sizes	Number of threads per inch	Major diameter	Pitch diameter	Minor diameter	Nominal sizes	Number of threads per inch	Major diameter	Pitch diameter	Minor diameter
in	<i>n</i>	<i>D, d</i> mm	<i>D₂, d₂</i> mm	<i>D₁, d₁</i> mm	in	<i>n</i>	<i>D, d</i> mm	<i>D₂, d₂</i> mm	<i>D₁, d₁</i> mm
1.312 5	18 16 12 8	33,337	32,420 32,306 31,963 31,275	31,963 31,794 31,278 30,246	2.125 0	16 12 8	53,975	52,943 52,600 51,912	52,431 51,916 50,884
1.375 0	18 16 12 8 6	34,925	34,008 33,893 33,550 32,862 32,174	33,551 33,381 32,865 31,834 30,802	2.250 0	16 12 8 4,5	57,150	56,118 55,775 55,087 53,484	55,606 55,091 54,059 51,651
1.437 5	18 16 12 8	36,512	35,595 35,481 35,138 34,450	35,138 34,969 34,453 33,221	2.375 0	16 12 8	60,325	59,293 58,950 58,262	58,781 58,266 57,234
1.500 0	18 16 12 8 6	38,100	37,183 37,068 36,725 36,037 35,349	36,726 36,556 36,040 35,009 33,978	2.500 0	16 12 8 4	63,500	56,118 62,125 61,437 59,374	55,606 61,441 60,409 57,315
1.562 5	18 16 12 8	39,687	38,770 38,656 38,313 37,625	38,313 38,144 37,628 36,596	2.625 0	16 12 8	66,675	65,643 65,300 64,612	65,131 64,616 63,584
1.625 0	18 16 12 8	41,275	40,358 40,243 39,900 39,212	39,901 39,731 39,216 38,184	2.750 0	16 12 8 4	69,850	68,818 68,475 67,787 65,725	68,306 67,791 66,759 63,665
1.687 5	18 16 12 8	42,862	41,945 41,831 41,488 40,800	41,488 41,319 40,803 39,771	2.875 0	16 12 8	73,025	71,993 71,650 70,962	71,481 70,966 69,934
1.750 0	16 12 8 5	44,450	43,418 43,075 42,387 41,150	42,906 42,391 41,359 39,502	3.000 0	16 12 8 4	76,200	75,168 74,825 74,137 72,075	74,656 74,141 73,109 70,015
1.812 5	16 12 8	46,037	45,006 44,663 43,975	44,494 43,978 42,946	3.125 0	16 12 8	79,375	78,343 78,000 77,312	77,831 77,316 76,284
1.875 0	16 12 8	47,625	46,593 46,250 45,562	46,081 45,566 44,534	3.250 0	16 12 8 4	82,550	81,518 81,175 80,487 78,425	81,006 80,491 79,459 76,365
1.937 5	16 12 8	49,212	48,181 47,838 47,150	47,669 47,153 46,121	3.375 0	16 12 8	85,725	84,693 84,350 83,662	84,181 83,666 82,634
2.000 0	16 12 8 4,5	50,800	49,768 49,425 48,737 47,134	49,256 48,741 47,709 45,301	3.500 0	16 12 8 4	88,900	87,868 87,525 86,837 84,775	87,356 86,841 85,809 82,715
					3.625 0	16 12 8	92,075	91,043 90,700 90,012	90,531 90,016 88,984