



[Home](#) | [About](#) | [Table of Contents](#) | [Advanced Search](#) | [Copyright](#) | [Feedback](#) | [Privacy](#)

You are here: Chapter: [5 Miscellaneous engineering data](#)

Section: 5.1 Screw threads

[« Previous Chapter](#)

[Next Section »](#)

Unless otherwise stated this page contains Version 1.0 content ([Read more about versions](#))

5.1 Screw threads

The International Organization for Standardization (ISO) has published recommendations for parallel screw threads which recognize the ISO metric thread and the ISO inch thread. The ISO inch thread is the same as the Unified screw thread previously standardized by the USA, Britain and Canada. The ISO metric thread has the same form of thread as that of the Unified thread, namely, a symmetrical vee-form having a 60° included angle between the flanks.

Prior to the issue of the ISO Recommendations it was customary for bolts and machine screws made in Britain to have a thread of Whitworth form (55° included angle) for diameters $\frac{1}{4}$ inch and above, and for sizes less than $\frac{1}{4}$ inch diameter the British Association (BA) thread ($47\frac{1}{2}^\circ$ included angle) was most commonly used. The Unified thread was also extensively used in the motor vehicle and aeronautical industries. BA threads and threads of Whitworth form will eventually become obsolete, but it may be years before this occurs. It is likely also that Unified screw threads will continue to be used for many years in certain industries.

The major diameter of a screw thread is the diameter over the crests of an external thread or to the roots of an internal thread. The pitch is the distance between adjoining crests (say) of the same thread, measured parallel to the axis of the screw. It is specified by the reciprocal of the number of turns per inch (t.p.i.) for Whitworth and Unified screws.

For any one thread form various combinations of major diameter and pitch have been standardized to form screw-thread series; in the BA system major diameters and associated pitches are designated by means of numbers. The more common standard series are given in the tables below for sizes up to about 25 mm (1 in).

<i>ISO inch (Unified) threads</i>		<i>ISO metric threads</i>	
<i>Unified Coarse (U N C)</i>	<i>Unified Fine (U N F)</i>	<i>Coarse</i>	<i>Fine</i>

<i>Major diameter/in</i>	<i>t.p.i</i>	<i>Major diameter/in</i>	<i>t.p.i</i>	<i>Major diameter/mm</i>	<i>Pitch/mm</i>	<i>Major diameter/mm</i>	<i>Pitch/mm</i>
—	—	(No. 0) 0.0600	80	1.6	0.35	1.6	0.20
(No. 1) 0.0730	64	(No. 1) 0.0730	72	1.8	0.35	1.8	0.20
(No. 2) 0.0860	56	(No. 2) 0.0860	64	2	0.40	2	0.25
(No. 3) 0.0990	48	(No. 3) 0.0990	56	2.2	0.45	2.2	0.25
(No. 4) 0.1120	40	(No. 4) 0.1120	48	2.5	0.45	2.5	0.35
(No. 5) 0.1250	40	(No. 5) 0.1250	44	3	0.50	3	0.35
(No. 6) 0.1380	32	(No. 6) 0.1380	40	3.5	0.60	3.5	0.35
(No. 8) 0.1640	32	(No. 8) 0.1640	36	4	0.70	4	0.50
(No. 10) 0.1900	24	(No. 10) 0.1900	32	4.5	0.75	4.5	0.50
(No. 12) 0.2160	24	(No. 12) 0.2160	28	5	0.80	5	0.50
$\frac{1}{4}$	20	$\frac{1}{4}$	28	6	1.00	6	0.75
$\frac{5}{16}$	18	$\frac{5}{16}$	24	7	1.00	7	0.75
$\frac{3}{8}$	16	$\frac{3}{8}$	24	8	1.25	8	1.00
$\frac{7}{16}$	14	$\frac{7}{16}$	20	9	1.25	10	1.25
$\frac{1}{2}$	13	$\frac{1}{2}$	20	10	1.50	12	1.25
$\frac{9}{16}$	12	$\frac{9}{16}$	18	11	1.50	14	1.50
$\frac{5}{8}$	11	$\frac{5}{8}$	18	12	1.75	16	1.50
$\frac{3}{4}$	10	$\frac{3}{4}$	16	14	2.00	18	1.50
$\frac{7}{8}$	9	$\frac{7}{8}$	14	16	2.00	20	1.50

1	8	1	12	18	2.50	22	1.50
				20	2.50	24	2.00
				22	2.50		
				24	3.00		

<i>Whitworth form threads</i>				<i>BA threads</i>		
<i>British Standard Whitworth (BSW)</i>		<i>British Standard Fine (BSF)</i>		<i>BA</i>		
<i>Major diameter/in</i>	<i>t.p.i</i>	<i>Major diameter/in</i>	<i>t.p.i</i>	<i>No.</i>	<i>Major diameter/mm</i>	<i>Pitch/mm</i>
$\frac{1}{4}$	20	$\frac{1}{4}$	26	0	6.0	1.00
—	—	$\frac{9}{32}$	26	1	5.3	0.90
$\frac{5}{16}$	18	$\frac{5}{16}$	22	2	4.7	0.81
$\frac{3}{8}$	16	$\frac{3}{8}$	20	3	4.1	0.73
$\frac{7}{16}$	14	$\frac{7}{16}$	18	4	3.6	0.66
$\frac{1}{2}$	12	$\frac{1}{2}$	16	5	3.2	0.59
$\frac{9}{16}$	12	$\frac{9}{16}$	16	6	2.8	0.53
$\frac{5}{8}$	11	$\frac{5}{8}$	14	7	2.5	0.48
$\frac{11}{16}$	11	$\frac{11}{16}$	14	8	2.2	0.43
$\frac{3}{4}$	10	$\frac{3}{4}$	12	9	1.9	0.39

$\frac{7}{8}$	9	$\frac{7}{8}$	11	10	1.7	0.35
1	8	1	10			

References

BS 1580 Unified (ISO, inch) screw threads: Parts 1 and 2 (1962); Part 3 (1965).

BS 3643 ISO metric screwthreads: Parts 1 and 2 (1981).

BS 84 (1956) Whitworth form screwthreads.

BS 2779 (1986) Pipe threads for tubes and fittings (metric dimensions).

BS 93 (1951) British Association threads (obsolescent).

BS 21 (1973) British Standard Pipe threads (taper).

O.C.Jones

[« Previous Chapter](#)

[Next Section »](#)

[Home](#) | [About](#) | [Table of Contents](#) | [Advanced Search](#) | [Copyright](#) | [Feedback](#) | [Privacy](#) | [^ Top of Page ^](#)

This site is hosted and maintained by the [National Physical Laboratory](#) © 2012.