

BS 8498:2008



BSI Standards Publication

British Standards for screw threads and screw gauges – Introduction and guidance

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Summary of pages

This document comprises a front cover, an inside front cover, pages i to ii, pages 1 to 20, an inside back cover and a back cover.

Foreword

Publishing information

This British Standard is published by BSI and came into effect on 31 December 2008. It was prepared by Subcommittee SFTSE/1, *Screws and fasteners technical specification committee*, under the authority of Technical Committee FME/9, *Nuts, bolts and accessories*. A list of organizations represented on this committee can be obtained on request to its secretary.

Relationship with other publications

This British Standard gives a general introduction to two series of standards related to single start parallel screw threads, the series specifying the screw threads (BS 84, BS 93, the two parts of BS 1580 and the two parts of BS 3643) and the series specifying the corresponding screw gauges (the BS 919 series and the standard for gauge blanks, BS 1044-1).

Hazard warnings

WARNING. Attention is drawn to the fact that, with the different screw thread forms available, there is the possibility of a mismatch, which is potentially hazardous. It is the responsibility of the designer of the end product to ensure that this possibility is reduced to a minimum. For further information on mismatches of screw thread systems see PD 6494.

Use of this document

As a guide, this British Standard takes the form of guidance and recommendations. It should not be quoted as if it were a specification and particular care should be taken to ensure that claims of compliance are not misleading.

Presentational conventions

The provisions in this standard are presented in roman (i.e. upright) type. Its recommendations are expressed in sentences in which the principal auxiliary verb is “should”.

Commentary, explanation and general informative material is presented in smaller italic type, and does not constitute a normative element.

Contractual and legal considerations

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard cannot confer immunity from legal obligations.

1 Scope

This British Standard gives a general introduction to the series of British Standards specifying single start parallel screw threads of Whitworth, British Association (B.A.), Unified and ISO metric forms, the series of British Standards specifying the corresponding screw gauges with which they are to be used, and the British Standard specifying the gauge blanks.

2 General

The screw thread standards and the corresponding screw gauge standards are listed in Table 1.

NOTE For details of the British Standard for gauge blanks (BS 1044-1:2008), see Clause 6.

Table 1 Screw thread standards and corresponding screw gauge standards

Thread form	Screw thread standard	Screw gauge standard
Imperial units		
Whitworth	BS 84:2007	BS 919-2:2007 ^{A)}
Unified ($\geq \frac{1}{4}$ in)	BS 1580-1:2007 ^{B)}	BS 919-1:2007 and BS 919-4:2007
Unified ($< \frac{1}{4}$ in)	BS 1580-3:2007	BS 919-1:2007
Metric units		
British Association (B.A.)	BS 93:2008 ^{C)}	BS 919-2:2007 ^{A), D)}
ISO metric	BS 3643-1:2007	BS 919-3:2007
	BS 3643-2:2007	BS 919-3:2007

^{A)} The gauges specified in this standard are also suitable for other thread forms such as BSC and BS Conduit.
^{B)} Superseded BS 1580 Parts 1 & 2:1962.
^{C)} Approximate inch equivalents are also given.
^{D)} BS 919-2:2007 specifies the dimensions of gauges in imperial units. However, in practice these gauges are sufficiently accurate to be used for checking screw threads for conformity to BS 93:2008.

3 Whitworth threads and British Association (B.A.) threads (BS 84:2007, BS 93:2008 and BS 919-2:2007)

3.1 Screw threads

3.1.1 Whitworth threads (BS 84:2007)

BS 84:2007 specifies external and internal threads in the following thread series:

- a coarse thread series, the British Standard Whitworth (B.S.W.) series, with nominal diameters in the range $\frac{1}{8}$ in to 6 in.
- a fine thread series, the British Standard fine (B.S.F.) series, with nominal diameters in the range $\frac{3}{16}$ in to $4\frac{1}{4}$ in.

NOTE The tables of limits and tolerances for the B.S.F series extend up to the 3 in size only, since nominal sizes above 3 in are rarely used.

- c) a supplementary selected thread (WHIT. S.) series with nominal diameters from $\frac{1}{4}$ in to 7 in.
- d) a truncated Whitworth form series.

BS 84:2007 specifies limits of sizes, and tolerances, for three tolerance classes of external threads, close, medium and free, and two classes of internal threads, medium and normal. BS 84:2007 specifies requirements for unplated threads and also for metal plated threads (including threads plated with cadmium, nickel, tin or zinc) with a thickness of plating of the order of 0.000 2 in. A summary of the data tabulated in BS 84:2007 is given in Table 2.

Table 2 Summary of data tabulated in BS 84:2007 (Whitworth threads)

Series	Data	Thread type	Thread class	Table
Coarse	Basic sizes	—	—	Table 1
Coarse	Limits and tolerances	External	Close	Table 2
			Medium	Table 4
			Free	Table 6
Coarse	Limits and tolerances	Internal	Medium	Table 3
			Normal	Table 5
Fine	Basic sizes	—	—	Table 7
Fine	Limits and tolerances	External	Close	Table 8
			Medium	Table 10
			Free	Table 12
Fine	Limits and tolerances	Internal	Medium	Table 9
			Normal	Table 11
Selected	Preferred diameters and pitches – Fractional sizes	—	—	Table 13A
	Preferred diameters and pitches – Decimal sizes	—	—	Table 13B
Selected (and non-standard)	Depths of thread for various pitches	—	—	Table 14
Selected (and non-standard)	Allowances	External	Medium and free	Table 15
Selected (and non-standard)	Tolerances	External	Close	Table 16
			Medium	Table 18
			Free	Table 20
Selected (and non-standard)	Tolerances	Internal	Medium	Table 17
			Normal	Table 19
Truncated	Basic data	External and internal	—	Table A.1
Truncated coarse	Limits and tolerances	External and internal	All	Table A.2

Table 2 Summary of data tabulated in BS 84:2007 (Whitworth threads) (*continued*)

Series	Data	Thread type	Thread class	Table
Truncated fine	Limits and tolerances	External and internal	All	Table A.3
Coarse for special uses	Limits and tolerances	Internal	Close	Table E.1
Fine for special uses	Limits and tolerances	Internal	Close	Table E.2
Selected (and non-standard) for special uses	Tolerances	Internal	Close	Table E.3

3.1.2 British Association (B.A.) threads (BS 93:2008)

BS 93:2008 specifies external and internal threads in 17 sizes with designations from 0 B.A. to 16 B.A.

BS 93:2008 specifies basic sizes for B.A. threads of sizes 0 B.A. to 16 B.A. It specifies limits of size, and tolerances, for the following classes of threads:

- a) close class external threads of sizes 0 B.A. to 10 B.A.;
- b) normal class external threads of sizes 0 B.A. to 10 B.A., and of sizes 11 B.A. to 16 B.A.;
- c) a single class of internal threads of sizes 0 B.A. to 16 B.A.

A summary of the data tabulated in BS 93:2008 is given in Table 3

Table 3 Summary of data tabulated in BS 93:2008 (B.A. threads)

Sizes/ Designation numbers	Data	Thread type	Thread class	Table
Metric data				
0 to 16	Basic sizes	—	—	Table 1
0 to 10	Limits and tolerances	External	Close	Table 2
0 to 10	Limits and tolerances	External	Normal	Table 3
11 to 16	Limits and tolerances	External	Normal	Table 4
0 to 16	Limits and tolerances	Internal	—	Table 5
Approximate inch equivalents				
0 to 16	Basic sizes	—	—	Table D.1
0 to 10	Limits and tolerances	External	Close	Table D.2
0 to 10	Limits and tolerances	External	Normal	Table D.3
11 to 16	Limits and tolerances	External	Normal	Table D.4
0 to 16	Limits and tolerances	Internal	—	Table D.5

3.2 Gauges

BS 919-2:2007 specifies the following gauges and setting plugs for Whitworth and B.A. threads:

- a) screw gauges for general and reference use:
 - 1) solid (non-adjustable) screw plug gauges, GO and NOT GO;
 - 2) solid and adjustable GO screw ring gauges;
 - 3) adjustable thread calliper gauges, GO and NOT GO;

NOTE 1 NOT GO effective diameter ring gauges are also included since they have certain limited applications. In principle, however, their use is not recommended.

- b) plain plug gauges and plain calliper gauges for the crests of threads;

NOTE 2 Provision is made in the standard for both GO and NOT GO plain gauges, but GO plain gauges are normally required only in the case of threads where the corresponding GO screw gauges do not control the maximum metal condition at the crests of the threads of the product.

- c) setting plugs for adjustable screw ring and thread calliper gauges, GO and NOT GO.

A summary of the data tabulated in BS 919-2:2007 is given in Table 4.

Table 4 Summary of data tabulated in BS 919-2:2007 (gauges and setting plugs for Whitworth and B.A. threads)

Gauge type	Data	GO/NOT GO	Details of use	Table
Plug gauges				
Screw plug gauges (General)	Limits of tolerance	GO	—	Table 1
Screw plug gauges (Reference)	Limits of tolerance	GO	Also for close fit workpieces	Table 2
Effective diameter plug gauges	Limits of tolerance	NOT GO	All classes of workpiece	Table 3
Plain plug gauges for minor diameters	Limits of tolerance	GO and NOT GO	All classes of workpiece	Table 4
Ring gauges and calliper gauges				
Screw ring and thread calliper gauges (General)	Tolerances	GO	—	Table 5
Effective diameter ring gauges and thread calliper gauges	Limits of tolerance	NOT GO	All classes of workpiece	Table 6
Plain calliper (GAP) gauges for major diameters	Tolerances	GO and NOT GO	All classes of workpiece	Table 7
Setting plugs				
Setting plugs for thread calliper or adjustable screw ring gauges (General)	Limits of tolerance	GO and NOT GO	—	Table 8
Setting plugs for thread calliper or adjustable screw ring gauges (Reference)	Limits of tolerance	GO	—	Table 9