

BRITISH STANDARD

Unified screw threads –

Part 3: Screw threads with diameters below $\frac{1}{4}$ in – Requirements

ICS 21.040.20



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Foreword

Publishing information

This part of BS 1580 is published by BSI and came into effect on 31 December 2007. 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.

Supersession

This part of BS 1580 supersedes BS 1580-3:1965, which is withdrawn.

Relationship with other publications

BS 1580 is now published in two parts

- *Part 1: Screw threads with diameters $\frac{1}{4}$ in and larger – Requirements*
- *Part 3: Screw threads with diameters below $\frac{1}{4}$ in – Requirements*

This part of BS 1580 is intended for use with BS 919-1 which specifies the corresponding screw gauges.

Information about this document

This part of BS 1580 has been fully revised to bring it up to date.

The range of diameters covered by this part of BS 1580 falls within the range of the B.A. screw thread sizes given in BS 93. The various pitches given for the same diameter in the unified system, however, offer a wider selection of diameter/pitch combinations for specific applications than do those in the B.A. system. The UNF series gives the closest approximation to the B.A. diameter/pitch combinations.

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.

Presentational conventions

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

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 part of BS 1580 specifies limits of sizes, and tolerances, for single-start, clearance-fit unified screw threads, in inch units with diameters below $\frac{1}{4}$ in.

This part of BS 1580 specifies unified screw threads from Number 0 (0.060 in diameter) to Number 12 (0.216 in diameter), known as the “numbered sizes” in the following standard series:

- a coarse thread (UNC) series;
- a fine thread (UNF) series;
- for Number 12 threads, an extra fine (UNEF) 32 threads per inch diameter/pitch combination.

NOTE Unified screw threads below $\frac{1}{4}$ in diameter for attachment purposes and for general use in the aircraft industry are specified in Annex A.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

BS 919-1:2007, *Screw gauge limits and tolerances – Part 1: Specification for gauges for screw threads of unified form*

BS 1580-1:2007, *Unified screw threads – Part 1: Screw threads with diameters $\frac{1}{4}$ in and larger – Requirements*

BS 1981, *Specification for unified machine screws and machine screw nuts*

BS 6528:1984, *Glossary of terms for cylindrical screw threads*

3 Terms and definitions and symbols

3.1 Terms and definitions

For the purposes of this part of BS 1580 the terms and definitions given in BS 6528:1984 and in BS 1580-1:2007 apply.

3.2 Symbols

For the purposes of this part of BS 1580 the symbols given in BS 1580-1:2007 apply.

4 Thread profiles

The basic profile and the design profile shall be as specified in BS 1580-1:2007, Clause 4.

The dimensions of the thread profile shall be as specified in Table 16.

5 Diameter/pitch combinations

The diameter/pitch combinations for standard series unified threads below $\frac{1}{4}$ in diameter shall be as specified in Table 1.

NOTE Where possible, the use of No. 1, No. 3 and No. 12 sizes should be avoided and preference should be given to the first choice sizes listed in Column 1.

6 Tolerance classes

External threads and internal threads shall be of one of the following tolerance classes as specified in BS 1580-1:2007, Clause 6:

- a) external threads:
 - Class 2A;
 - Class 2AG (see Note 1)
 - Class 3A;
- b) internal threads:
 - Class 2B;
 - Class 3B.

NOTE 1 These are Class 2A coated threads where the allowance has to be maintained after coating.

NOTE 2 Classes 1A and 1B specified in BS 1580-1 are not considered suitable for the sizes of unified screw threads specified in this part of BS 1580.

NOTE 3 Owing to the tendency for close-fitting external and internal threads made of stainless steel to seize when tightened together, it is recommended that stainless steel external and internal uncoated threads should not be made to Class 3 limits but rather to Class 2 limits.

7 Tolerances, allowances and limits of size for uncoated threads

Tolerances, allowances and limits of size for finished uncoated threads shall be as given in Table 2.

NOTE 1 The limits and tolerances for threads specified in Table 2 are repeated in Table 3 to Table 12, separated according to series and tolerance class for the convenience of users of this standard.

NOTE 2 The tolerances and allowances for unified screw threads below $\frac{1}{4}$ inch diameter, of Classes 2A, 2B, 3A and 3B have been based on the same formulae as those for the larger diameters (see BS 1580-1:2007, Annex A) with the exception of the tolerances for the minor diameters of Class 2B internal threads which are the same as those for Class 3B internal threads. These tolerances have been calculated from the following formula:

$$0.05\sqrt[3]{P^2} + 0.03P/D - 0.002$$

with a maximum tolerance of 0.394P.

NOTE 3 The effective diameter tolerances have been based on a length of engagement between $\frac{2}{3}$ and $1\frac{1}{2}$ times the nominal major diameter. For adjustment of these tolerances for shorter lengths of engagement see BS 1580-1:2007, Clause 7 Note 4.

NOTE 4 The values given for the minimum major diameters of internal threads are not realized in practice as the roots of the threads are always cleared above the minimum major diameter.