

BRITISH STANDARDS INSTITUTION

INCORPORATED BY ROYAL CHARTER

**BRITISH STANDARD SPECIFICATIONS FOR
MACHINE SCREWS AND NUTS
(UNIFIED THREADS) BELOW $\frac{1}{4}$ INCH
FOR AERONAUTICAL PURPOSES**

FOREWORD

This replacement of British Standards A.205, A.207 and A.209 and revision of A.204, A.206 and A.208, November, 1957, has been prepared to extend the range of steel screws and nuts and brass nuts to include Unified thread sizes No. 0 and No. 2: and to include a range of brass screws in all sizes covered by the specifications. In addition, the head diameters of pan head screws have been brought into line with those specified in B.S. 3155, 'American machine screws and nuts in sizes below $\frac{1}{4}$ inch diameter'.

The standard requires reference to the following British Standards :

- | | |
|-----------|--|
| B.S. 1580 | Unified screw threads |
| B.S. 3155 | American machine screws and nuts in sizes below $\frac{1}{4}$ inch diameter. |

NOTE. The values in British units are to be regarded as the standard. The table in Appendix D gives the approximate millimetre equivalents of basic diameters of sizes No. 0 to No. 10 and the table in Appendix E provides a ready means of calculating the approximate millimetre equivalents of other inch dimensions. More accurate conversions should be based on the tables in B.S. 350, Part 2: 1962.

Temporary Notice

Due to the current stocks still held of screws to A 205, A 207 and A 209:1957, these specifications may continue to be called up for appropriate use over a limited period to be decided, after which time they are to be replaced by specifications A 217, A 218 and A 219, respectively, herein. Due notification of the withdrawal of A 205, A 207 and A 209 will be given but meanwhile they are to be considered obsolescent.

SPECIFICATION

SCOPE

1. These British Standards specify the dimensions, material, protective treatment and part numbers for countersunk head and pan head machine screws and nuts with Unified threads for aeronautical use.

MATERIALS

2. The screws and nuts shall be manufactured from the appropriate materials specified in Table 1 or Table 2

FREEDOM FROM DEFECTS

3. *a.* The screws and nuts shall be free from harmful defects.

b. Screws and nuts may be rejected at any time for faults in, or revealed by, manufacture although they have been made from material passed previously for chemical composition and mechanical properties.

DIMENSIONS

4. With the exception of the thread, the screws and nuts shall, before coating, conform to the dimensions and tolerances given in Tables 3, 4 or 6.

HEADS OF SCREWS

5. *a.* Screw heads shall be concentric with the shank. Slots shall be clean and free from burrs and, on visual inspection, shall be central with the head.

b. The depth of slot (Dimension J) shall be measured from the top of the head to the point at which the slot breaks through. Tolerances are given in Tables 3 and 4.

LENGTH OF SCREWS

6. *a. Countersunk head screws.* The nominal length of countersunk head screws shall be the distance from the upper surface of the head to the end of the shank, including any chamfer or radius, but excluding the plain cylindrical extension of the shank which may be used as an identification of the Unified thread. (See Appendix A, Fig. 6.)

b. Pan head screws. The nominal length of pan head screws shall be the distance from the underside of the head to the end of the shank, including any chamfer or radius, but excluding the plain cylindrical extension of the shank which may be used as an identification of the Unified thread. (See Appendix A, Fig. 6.)

2A. 204, 2A. 206, 2A. 208 and
A. 217 to A. 225 April, 1963

c. *Tolerance on length.* The permissible tolerance on the nominal length of screws shall be as follows:

Nominal length	Tolerance
in	in
Up to and including $\frac{1}{2}$	$+0 - 0.020$
Over $\frac{1}{2}$	$+0 - \frac{1}{32}$ (0.031)

ENDS OF SCREWS

7. a. *Rolled threads.* When screws are made with rolled threads the lead formed at the end of the screw by the thread-rolling operation may be regarded as providing the necessary chamfer to the end and no other machining operation is necessary, unless the purchaser, in his enquiry and order, has specified that the ends shall be finished as described in Clause 7b. The end shall be at right angles to the axis of the screw within the tolerance permitted by the following test:

The screw shall be screwed into a ring gauge, the face of which is square to the axis of the thread, until the low point of the screw end is flush with the gauge

As altered
Jan. 1964

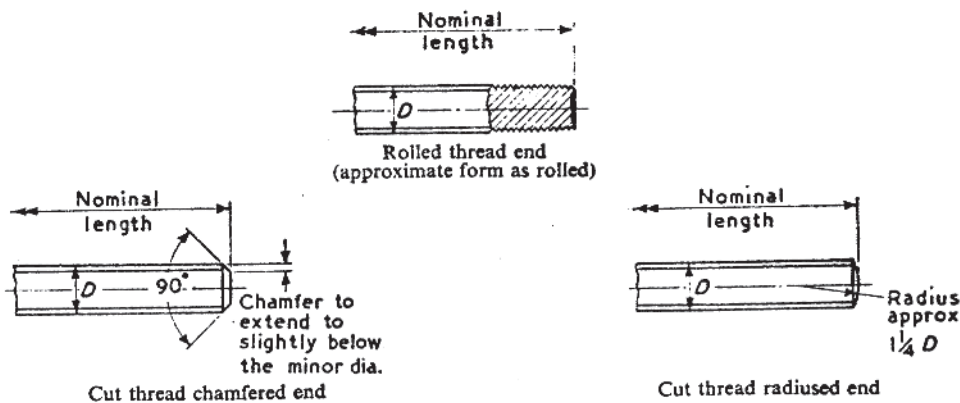


Fig. 1. Types of end permissible on screws

face. The distance between the gauge face and the high point of the screw end shall not exceed one pitch.

b. *Cut threads.* The ends of screws with cut threads may, at the option of the manufacturer, be finished either with a chamfer with a 90° included angle to a depth slightly exceeding the depth of thread, or with a radius approximately equal to $1\frac{1}{4}$ times the nominal diameter of the shank.

NOTE 1. For convenience, one type of end only is illustrated in the figures at the head of Tables 3 and 4. The alternative types of end permissible are shown in Fig. 1.

NOTE 2. At the option of the manufacturer screws may have an additional plain cylindrical extension at the end of the shank. (See Clause 13a).

SCREW THREADS

8. a. *Screws.* The screw threads may be either cut or rolled at the option of the manufacturer. The screw threads shall have the thread form and pitches specified in B.S.1580, and shall conform to the Class 2A limits and tolerances specified in Table 18 of B.S.3155.

b. *Nuts.* The screw threads shall have the thread form and pitches specified in B.S.1580, and shall conform to the Class 2B limits and tolerances specified in Table 19 of B.S.3155.

On plated nuts, after plating, the major, effective and minor diameters shall not be less than the minimum limits, and before plating the effective and minor diameters shall not exceed the maximum limits specified in those tables.

c. *General.* The screw threads shall be required to pass gauges approved by the Inspecting Authority.

LENGTH OF THREAD ON SCREWS

9. a. *Countersunk head screws.* Countersunk head screws shall be threaded as far as possible up to the head. The length of unthreaded shank under the head shall not exceed twice the pitch and is defined as the distance from the leading face of a standard nut or ring gauge without countersink which has been screwed on as far as possible by hand to the junction of the basic major diameter and the countersunk portion of the head.

b. *Pan head screws.* Pan head screws shall be threaded to leave a length of unthreaded shank under the head not exceeding twice the pitch. The length of unthreaded shank is defined as the distance from the leading face of a

standard nut or ring gauge without countersink which has been screwed on as far as possible by hand to the underside of the head.

CHAMFERING

10. All nuts shall have a chamfer of approximately 30° on both faces.

COUNTERSINKING

11. All nuts shall be countersunk on one face to the major diameter of the thread at an angle of 90°-120°, as indicated in Figures 4 and 5.

FINISH

12. The screws and nuts shall conform to the protective treatment for the appropriate material specified in Tables 1 and 2.

IDENTIFICATION AND MARKING

13. a. *Screws of No. 4-40 UNC nominal size and larger* shall be identified as having Unified threads by means of the application of either of the following features, details of which are given in Appendix A to this British Standard:

Amendment No. 1, published 6 January 1964
to British Standards
2 A.204, 2 A.206, 2 A.208 and A.217 to A.225 : 1963
Machine screws and nuts (Unified threads)
below $\frac{1}{4}$ inch for aeronautical purposes

Corrigenda

Fig. 1. Reverse the captions of the two lower illustrations.

Table 2. In the footnote insert 'or D.T.D.924' after 'D.T.D.904'.

Table 4. In Column 4, against 'No. 2—64 UNF' delete '0·115' and substitute '0·155'.

Table 6. In Column 1, delete '0·80' and '2·64' and substitute '0-80' and '2-64' respectively.

Appendix A. In Column 1 of the table amend the screw size figures to read '4-40', '6-32', '8-32' and '10-32' respectively.

Appendix C. In the first line of the equations adjacent to the Fig., delete ' $A=2\cdot048$ ' and insert ' $V=2\cdot048$ '.

Addition

Temporary Notice

Due to the current stocks still held of screws to A 205, A 207 and A 209:1957, these specifications may continue to be called up for appropriate use over a limited period to be decided, after which time they are to be replaced by specifications A 217, A 218 and A 219, respectively, herein. Due notification of the withdrawal of A 205, A 207 and A 209 will be given but meanwhile they are to be considered obsolescent.

PD 6167

Amendment No. 2, published 22 May, 1967
to British Standards
2A.204, 2A.206, 2A.208 and A.217 to A.225:1963
Machine screws and nuts (Unified threads)
below $\frac{1}{4}$ inch for aeronautical purposes

Revision

Table 3. Dimensions of countersunk head screws. In Column 11, against No. 0-80 UNF delete '0.007' and substitute '0.010'.

In Column 12, against No. 0-80 UNF delete '0.013' and substitute '0.015'.