

Specification for

100° Countersunk head steel bolts (Unified threads and cruciform recesses) for aircraft

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Foreword

This British Standard has been prepared at the request of the aircraft industry to provide for a range of steel bolts with countersunk recessed heads and Unified threads. With the exception of the recesses, the dimensions and tolerances specified are the same as those given in BS 2A 173 for countersunk slotted head bolts.

As in BS 2A 173, the “flushness tolerance” method is adopted for the dimensioning of the countersunk head. The basic principles and advantages of this method, first used in a British Standard for countersunk head fasteners in BS 1981, “*Unified machine screws and machine screw nuts*”, are outlined in Appendix A to this standard, together with suggested methods of gauging. Details of the method of gauging the screw-driver recesses are given in Appendix B.

Reference is made in the standard to the following British Standards:

BS A 100, *Bolts and nuts for aircraft* (general clauses).

BS S 102, *Carbon-molybdenum steel*.

BS S 105, *Carbon steel*.

BS S 147, *Nickel-chromium-molybdenum steel (bar for the manufacture of forged bolts only)*.

BS S 148, *Low nickel-chromium steel (bar for the manufacture of forged bolts only)*.

BS S 149, *1.75 per cent nickel-chromium-molybdenum steel*.

BS S ..., *1 % chromium-molybdenum steel bars for the manufacture of forged bolts and forged nuts*¹⁾.

NOTE The values in British units are to be regarded as the standard. A table is given in Appendix C to provide a ready means of calculating the approximate millimetre equivalents of the inch dimensions. More accurate conversions should be based on the tables in BS 350.

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.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 14, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

¹⁾ In course of preparation.

1 Scope

This British Standard specifies the material, dimensions, finish and inspection requirements for steel bolts with 100° countersunk recessed heads and Unified threads for aircraft.

2 General requirements

The bolts shall comply with the relevant requirements of Part 1 of BS A 100 in respect of manufacture, screw threads, and anti-corrosion treatment.

3 Material and manufacture

a) The bolts shall be forged from material which complies with the latest issue of one of the following British Standards:

BS S 102,
or BS S 105,
or BS S 147
or BS S 148
or BS S 149
or BS S ...²⁾

b) In the finally heat-treated condition, the mechanical properties of the material shall be as follows:

0.1 per cent proof stress	not less than 43 tons/in ² (68 kg/mm ²)
Tensile strength	not less than 55 tons/in ² (87 kg/mm ²)
	not more than 65 tons/in ² (102 kg/mm ²)
Elongation on 4 $\sqrt{\text{area}}$	not less than 18 per cent
Izod impact value	not less than 40 ft lb (6 kg m)

4 Dimensions

a) All finished bolts, after the application of the anti-corrosion coating, shall conform to the dimensions and tolerances given in Table 1 and Table 2.

b) The clamping length M of the bolt shall conform to the dimensions and tolerances given in Table 2, and shall be such that, when a standard nut without countersink or a ring gauge without countersink has been screwed on as far as possible by hand, its leading face is within the distance M from the upper surface of the bolt head. The run-out of thread shall not exceed twice the pitch.

c) The nominal length of the bolt shall be the minimum bearing length L, which is determined by the minimum clamping length M, less two thread pitches.

5 Screw threads

The bolts shall have unified threads of the form and class of fit specified in the relevant requirements of BS A 100, Part 1.

6 Anti-corrosion coating

All finished bolts shall be coated with cadmium.

7 Identification

The British Standard number and part number shall not be applied on the bolts, but shall be clearly marked on the labels of parcels of bolts.

8 Inspection procedure

The bolts shall be inspected in accordance with the relevant requirements of BS A 100, Part 2.

9 Gauging

a) The method of head dimensioning shown in Table 1 defines maximum and minimum head envelopes which control flushness in the manner described in Appendix A.

b) The type of gauge shown in Figure 4 and Figure 5 is recommended as being suitable for flushness measurement, but the type of gauge to be used is not a mandatory requirement of this standard. The gauge shown in Figure 4 and Figure 5 does not control the head angle, which will require to be checked at intervals during production. An additional gauge will be necessary for the absolute minimum head diameter.

c) The penetration of the recess shall be gauged in accordance with Appendix B.

²⁾ In course of preparation.

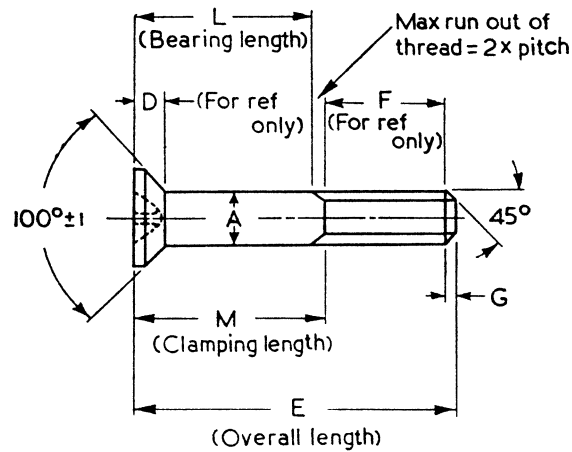


Figure 1 — Dimensions

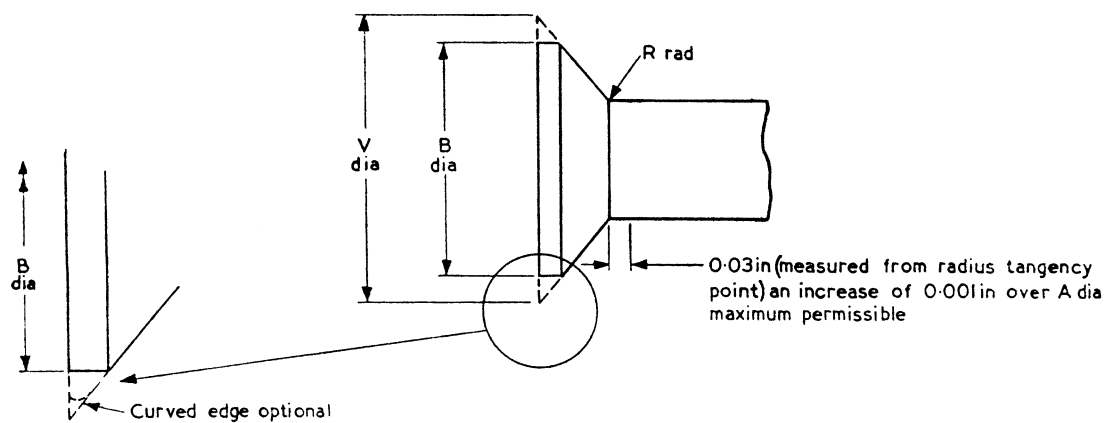
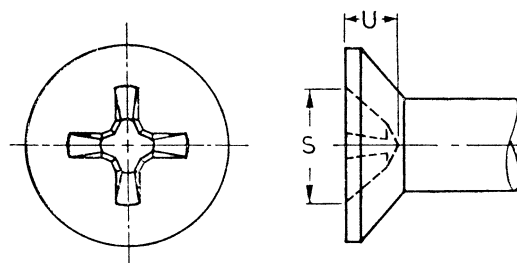


Figure 1a — Enlarged view of head

Figure 1b — Details of recess
Third angle projection