

Specification for

**Steel bolts
(Unified hexagons and
unified threads) for
aircraft**

[UDC 621.882.212.082.3:669.14:629.13]

Foreword

This revision of BS 2A 102:1956 has been prepared to relate the standard to the relevant requirements of BS A 100. Additionally, provision has been made for the use of alternative materials for forged bolts of nominal sizes below ½ in, and for the use of BS S 96 material for machined bolts.

Reference is made in the standard to the following British Standards:
BS A 100, *Bolts and nuts for aircraft (general clauses)*.

BS S 95, *55 ton, 1½ per cent nickel-chromium-molybdenum steel*.

BS S 102, *Carbon-molybdenum steel*.

BS S 105, *Carbon steel*.

BS S 114, *55 ton manganese-molybdenum steel*.

BS S 116, *55 ton carbon steel*.

BS S 117, *55 ton, 1 per cent chromium 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 154, *2½ % nickel-chromium-molybdenum steel billets, bars, forgings and parts (880 – 1 080 MPa: limiting ruling section 150 mm)*.

BS S 158, *1 % chromium-molybdenum steel bars for the manufacture of forged bolts and forged nuts*.

NOTE 1 The values in British units are to be regarded as the standard. A table is given in the Appendix 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.

NOTE 2 In place of the customary, but incorrect, use of the ton as a unit of force, the unit called a ton force (abbreviation tonf) has been used in this standard. It is the force which, when acting on a body of mass one ton, gives an acceleration equal to that of standard gravity.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself 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 10, 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.

Amendments issued since publication

Amd. No.	Date of issue	Comments
4663	October 1962	
5304	August 1964	
2113	October 1976	
5388	August 1988	Indicated by a sideline in the margin

This British Standard, having been approved by the Aircraft Industry Standards Committee and endorsed by the Chairman of the Engineering Divisional Council, was published under the authority of the General Council of the Institution on 4 June 1962

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The following BSI references relate to the work on this standard:
Committee reference ACE/12
Draft for comment AB (ACE) 2149

ISBN 0 580 34559 9

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1 Scope

This British Standard specifies the materials, dimensions finish and inspection requirements for steel bolts with Unified hexagons 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, anti-corrosion treatment, identification and marking.

3 Material and manufacture

a) The bolts shall be manufactured by one of the following methods:

i) Machined from bright drawn bars which comply with the latest issue of one of the following British Standards:

BS S 95

or BS S 114

or BS S 116 *Bolts up to and including $\frac{3}{8}$ in diameter;*

or BS S 117

or BS S 154

NOTE BS S 96 material may be used until stocks are exhausted.

ii) Forged from material which complies with the latest issue of one of the following British Standards:

BS S 102

or BS S 105 *Bolts up to and including $\frac{1}{2}$ inch diameter only;*

or BS S 147

or BS S 148

or BS S 149

or BS S 158

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

0.1 per cent proof stress not less than 43 tonf/in²
(664 MPa)

Tensile strength not less than 55 tonf/in²
(850 MPa)

not more than 65 tonf/in²
(1 003 MPa)

Elongation on 4√/area not less than 18 per cent

Izod impact value not less
than 40 ft lbf (54 J).

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 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 ring gauge without countersink has been screwed on as far as possible by hand, its leading face is within the distance M from the underside of the bolt head. The runout 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 treatment

All finished bolts shall be coated with cadmium.

7 Inspection procedure

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