

BS 2A 254 to 2A 259:2019



BSI Standards Publication

AEROSPACE SERIES

Bolts, hexagonal head, close tolerance shank, UNJF threads, split pin & locking wire hole options, titanium alloy, various finishes

Classification: R_m 1 100–1 250 MPa (160 000–180 000 lbf/in²)
at Ambient Temperature | +315°C

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Summary of pages

This document comprises a front cover, an inside front cover, pages i to ii, pages 1 to 12, an inside back cover and a back cover.

Foreword

Publishing information

This British Standard is published by BSI Standards Limited, under licence from The British Standards Institution, and came into effect on 30 September 2019. It was prepared by Technical Committee ACE/12, *Aerospace fasteners and fastening systems*. A list of organizations represented on this committee can be obtained on request to its secretary.

Supersession

BS 2A 254 to 2A 259:2019 supersedes BS A 254, BS A 255, BS A 256, BS A 257, BS A 258, BS A 259:1976, which is withdrawn.

Information about this document

This British Standard has been prepared to provide a range of 160 000 lbf/in² (1 100 MPa) to 180 000 lbf/in² (1 250 MPa) titanium alloy bolts with UNJ profile threads and close tolerance shanks for aerospace use. The lengths of the bolts are in fractional increments.

NOTE The values in imperial units are to be regarded as the standard.

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.

Where words have alternative spellings, the preferred spelling of the Shorter Oxford English Dictionary is used (e.g. “organization” rather than “organisation”).

Requirements in this standard are drafted in accordance with *Rules for the structure and drafting of UK standards*, subclause **G.1.1**, which states, “Requirements should be expressed using wording such as: ‘When tested as described in Annex A, the product shall ...’”. This means that only those products that are capable of passing the specified test will be deemed to conform to this standard.

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 specifies the materials, dimensions, finish and inspection requirements for titanium alloy bolts with hexagonal heads and UNJ thread for aerospace use.

CAUTION. BS A 257 bolts have cadmium as a plating material which has been restricted and/or banned for use in many countries owing to environmental and health concerns; **they should not be used in new product designs.** Local officials should be consulted about any concerns on the use of cadmium-plated parts. In addition, cadmium plating on titanium parts has been documented to result in stress corrosion and also solid metal embrittlement (SME) when exposed to relatively low temperatures. Accordingly, BS A 258 has been introduced as a replacement.

When considering the use of cadmium plated titanium bolts, attention is drawn to Def Stan 00-970 Pt.1/14 Section 4 Leaflet 8 which recommends certain limitations on their use.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes provisions 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 A 101, *General requirements for titanium bolts.*

BS A 242-245, *Hexagonal castle nuts (of class 3B UNJ thread)*

BS A 346 (ISO 3161), *UNJ threads – General requirements and limit dimensions*

BS M 58 (ISO 8080), *Specification for anodic coating of titanium and titanium alloys by the sulphuric acid process*

BS TA 28, *Forging stock and wire of titanium-aluminium-vanadium alloy (tensile strength 1 100–1 300 MPa) (limiting ruling section 20 mm)*

BS EN 2133, *Aerospace series – Cadmium plating of steels with specified tensile strength $\leq 1\,450$ MPa, copper, copper alloys and nickel alloys*

BS EN 2808, *Anodizing of titanium and titanium alloys*

BS EN 3813, *Aerospace series – Titanium alloy Ti-P64001 (Ti-6Al-4V) – Annealed – Bar and wire for forged fasteners – $D_e \leq 50$ mm*

DTD942, *Anodizing of titanium and titanium alloys*

DEF STAN 91-19/1, *Lubricant, solid film, heat cured*

SAE AS5272, *Lubricant, solid film, heat cured, corrosion inhibiting procurement specification*

SAE AMS03-19, *Electro-deposition of cadmium*

SAE AMS 4967, *Titanium alloy, bars, wire, forgings, and rings, 6.0Al – 4.0V, annealed, heat treatable*

SAE ITC RS678, *Fasteners, rolled threads, chamfers, lead threads and runouts*

3 Terms and definitions

No terms and definitions are listed in this document.

4 General requirements

- 4.1** The bolts shall be manufactured, inspected and tested in accordance with BS A 101.
- 4.2** All bolts shall conform to the dimensions and tolerances given in Table 1, Table 2 and Table 4, and Figure 1 and Figure 2. Unless otherwise specified, the dimensions are those before the application of surface treatment. The material requirements shall be as specified (see Table 3).
- 4.3** Dimension values shall be in inches.

Figure 1 — Basic outline

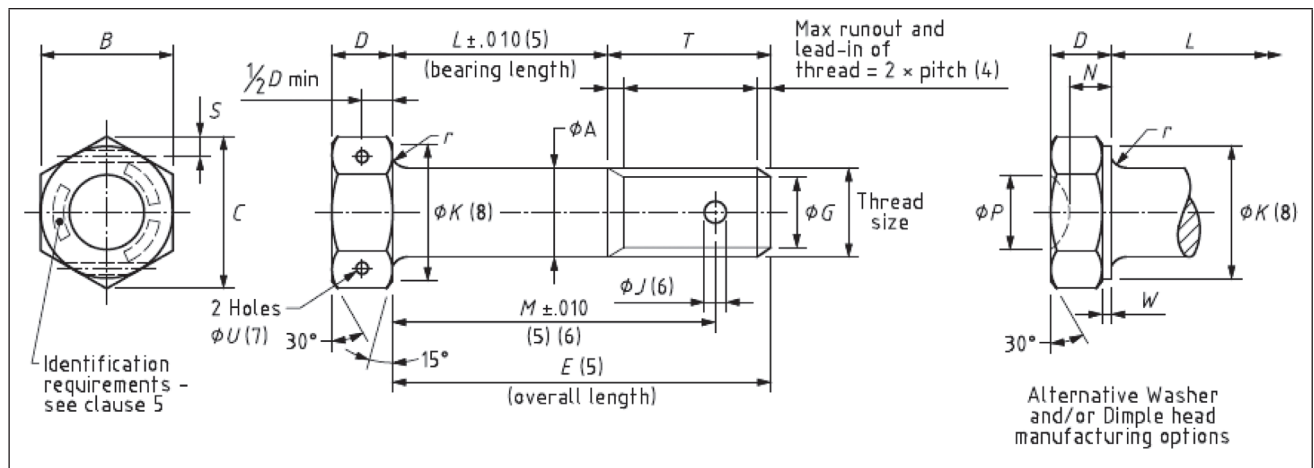


Table 1 — Dimensions (standard shank diameters)

1	2	3	4	5	6	7	8	9	10	11	12
Diameter code	Thread (1)		øA shank				Thread runout 2 x pitch	T	B AF		C AC
	Size UNJF	Decimal equivalent	Type A254 A255 A256 (2)		Type A257 (3) A258 (2)						
	ref	nom ref	min	max	min	max	max	min ref	min	max	min
03	10-32	·190	·1890	·1895	·1885	·1895	·063	·381	·367	·376	·419
04	1/4-28	·250	·2490	·2495	·2485	·2495	·071	·443	·430	·439	·491
05	5/16-24	·3125	·3115	·3120	·3110	·3120	·083	·506	·492	·502	·561
06	3/8-24	·375	·3740	·3745	·3735	·3745	·083	·615	·553	·564	·631
07	7/16-20	·4375	·4365	·4370	·4360	·4370	·100	·631	·679	·690	·775
08	1/2-20	·500	·4990	·4995	·4985	·4995	·100	·757	·741	·752	·845