



BSI Standards Publication

**Aerospace series — Bolts, with MJ threads,
made of alloy steel, strength class 1 100
MPa — Procurement specification**

National foreword

This British Standard is the UK implementation of ISO 7689:2025. It supersedes BS A 300:1989, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee ACE/12, Aerospace fasteners and fastening systems.

A list of organizations represented on this committee can be obtained on request to its committee manager.

Contractual and legal considerations

This publication has been prepared in good faith, however no representation, warranty, assurance or undertaking (express or implied) is or will be made, and no responsibility or liability is or will be accepted by BSI in relation to the adequacy, accuracy, completeness or reasonableness of this publication. All and any such responsibility and liability is expressly disclaimed to the full extent permitted by the law.

This publication is provided as is, and is to be used at the recipient's own risk.

The recipient is advised to consider seeking professional guidance with respect to its use of this publication.

This publication is not intended to constitute a contract. Users are responsible for its correct application.

© The British Standards Institution 2025
Published by BSI Standards Limited 2025

ISBN 978 0 539 02945 1
ICS 49.030.20

Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 31 May 2025.

Amendments/corrigenda issued since publication

Date	Text affected



International
Standard

ISO 7689

**Aerospace series — Bolts, with
MJ threads, made of alloy steel,
strength class 1 100 MPa —
Procurement specification**

*Série aérospatiale — Vis à filetages MJ, en acier allié, de classe de
résistance 1 100 MPa — Spécification d'approvisionnement*

**Third edition
2025-05**

Reference number
ISO 7689:2025(en)

© ISO 2025  **Documents**
Document Sharing Hub



COPYRIGHT PROTECTED DOCUMENT

© ISO 2025

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

	Page
Foreword	iv
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Quality assurance	3
4.1 General.....	3
4.2 Qualification inspection conditions.....	3
4.3 Acceptance inspection conditions.....	4
4.4 Use of "statistical process control (SPC)".....	4
5 Requirements	4
Annex A (informative) Cross sectional areas and formulae for tensile loads	18
Annex B (informative) Cross sectional areas and formulae for double shear loads	20
Bibliography	21

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

ISO draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). ISO takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, ISO had not received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at www.iso.org/patents. ISO shall not be held responsible for identifying any or all such patent rights.

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 20, *Aircraft and space vehicles*, Subcommittee SC 4, *Aerospace fastener systems*.

This third edition cancels and replaces the second edition (ISO 7689:2008), which has been technically revised.

The main changes compared to the previous edition are as follows:

- new tables for sampling;
- additional requirements in [Table 1](#), item no 2 "Dimensions";
- additional requirements in [Table 1](#), item no .4-1 "Tensile strength";
- additional requirements in [Table 1](#), item no 4-3 "Hardness";
- additional requirements in [Table 1](#), item no 4-4 "Recess removal torque";
- additional values in [Table 8](#) "Minimum loads for tensile and double shear tests" for protruding head;
- update of normative references.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Aerospace series — Bolts, with MJ threads, made of alloy steel, strength class 1 100 MPa — Procurement specification

1 Scope

This document specifies the characteristics and quality assurance requirements for MJ thread bolts made of alloy steel, of strength class 1 100 MPa, for aerospace construction.

It is applicable whenever it is referenced in a definition document.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

ISO 5855-2, *Aerospace — MJ threads — Part 2: Limit dimensions for bolts and nuts*

ISO 6506-1, *Metallic materials — Brinell hardness test — Part 1: Test method*

ISO 6507-1, *Metallic materials — Vickers hardness test — Part 1: Test method*

ISO 6508-1, *Metallic materials — Rockwell hardness test — Part 1: Test method*

ISO 7961, *Aerospace — Bolts — Test methods*

ISO 21920-3, *Geometrical product specifications (GPS) — Surface texture: Profile — Part 3: Specification operators*

AS/EN 9138, *Aerospace Series - Quality Management Systems Statistical Product Acceptance Requirements*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

3.1

production batch

quantity of finished bolts, manufactured using the same process, from a single material cast (single heat of alloy), having the same number of *definition document* (3.3), same thread and diameter code, heat treated together to the same specified condition and produced as one continuous run

3.2

inspection lot

quantity of bolts from a single *production batch* (3.1) having the same number of *definition document* (3.3)

3.3

definition document

document specifying directly or indirectly all the requirements for bolts

Note 1 to entry: The definition document can be an International Standard, an in-house standard or a drawing.

3.4

crack

rupture in the material which may extend in any direction and which may be intercrystalline or transcrystalline in character

3.5

seam

open surface defect

3.6

lap

surface defect caused by folding over metal fins or sharp corners and then rolling or forging them into the surface

3.7

crevice

hollow area at thread crest

3.8

inclusions

non-metallic particles originating from the material manufacturing process

Note 1 to entry: These particles can be isolated or arranged in strings.

3.9

sampling plan

plan according to which one or more samples are taken in order to obtain information and possibly to reach a decision

Note 1 to entry: In this document, each sampling plan specifies the number of bolts to be inspected as a function of the size of the batch and the acceptance number [number of defective items acceptable (Ac)]. See ISO 2859-1.

3.10

simple random sampling

sampling of n items from a population of N items in such a way that all possible combinations of n items have the same probability of being chosen

3.11

major defect

defect, other than critical, that is likely to result in a failure or to reduce materially the usability of the considered product (bolt) for its intended purpose

3.12

minor defect

defect that is not likely to reduce materially the usability of the considered product (bolt) for its intended purpose, or that is a departure from the established specification having little bearing on the effective use or operation of this product

3.13

limiting quality

LQ

<sampling plan (3.9)> quality limit that corresponds to a specified and relatively low probability of acceptance

Note 1 to entry: It is the limiting lot quality characteristic that the consumer is willing to accept with a low probability that a lot of this quality would occur.

Note 2 to entry: For the purposes of this document, the limiting quality quoted in [Table 4](#) to [7](#) corresponds to a probability of acceptance of 10 %.

3.14

acceptable quality limit

AQL

maximum percent defective (or maximum number of defects per hundred units) that, for purposes of sampling inspection, can be considered satisfactory as a process average

Note 1 to entry: Variant: quality limit which in a *sampling plan* ([3.9](#)) corresponds to a specified but relatively high probability of acceptance.

3.15

grip length

shank length

dimension from top of head (flush head bolt) or underhead bearing surface (protruding head bolt) to the end of full cylindrical portion of shank, excluding the thread radius at shank/slope transition

3.16

IRR

initial reliability requirement

inspection reliability requirement

minimum acceptable outgoing yield or probability of conformance

4 Quality assurance

4.1 General

The manufacturer shall be capable of continuous production of bolts complying with the quality requirements specified in this document.

The purpose of qualification inspections¹⁾ of bolts is to check that the design and manufacturing conditions of a bolt allow it to satisfy the requirements of this document.

Quality documentation for parts produced in accordance to this document shall be maintained for a minimum period of 10 years.

The purpose of production acceptance inspection of a bolt is to check, as simply as possible, using a method which is inexpensive but the most representative of the actual conditions of use, with the uncertainty inherent in statistical sampling, that the bolts satisfy the requirements of this document.

Production acceptance inspections shall be carried out by, or under the responsibility of, the manufacturer.

4.2 Qualification inspection conditions

Unless otherwise specified, the inspection shall be carried out on:

- each type and diameter of bolt;
- 25 bolts selected from a single inspection lot by simple random sampling.

The test programme can be reduced, or the qualification granted without inspection; any such decision shall be based on the results obtained on similar types and diameters of bolt provided that the design and manufacturing conditions are identical.

The inspections shall be repeated on any bolt if the manufacturing conditions have been modified.

[Table 2](#) indicates the allocation of bolt samples for the inspections.

1) In order to simplify the text the term "inspections" used in this document also refers to "inspections and tests".