
**Aerospace — Bolts, with MJ threads,
made of heat and corrosion resisting
steel, strength class 1 100 MPa —
Procurement specification**

*Aéronautique et espace — Vis à filetages MJ, en acier résistant à
la chaleur et à la corrosion, de classe de résistance 1 100 MPa —
Spécification d'approvisionnement*

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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 documents 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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

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

For an explanation on 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 the following URL: www.iso.org/iso/foreword.html.

The committee responsible for this document is ISO/TC 20, *Aircraft and space vehicles*, Subcommittee SC 4, *Aerospace fastener systems*.

This third edition cancels and replaces the second edition (ISO 8168:2008), which has been technically revised and includes the following changes:

- updated normative references;
- updated terminology; and
- editorial modifications.

Aerospace — Bolts, with MJ threads, made of heat and corrosion resisting 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 heat and corrosion resisting 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 2859-1:1999, *Sampling procedures for inspection by attributes — Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection*

ISO 3452-1, *Non-destructive testing — Penetrant testing — Part 1: General principles*

ISO 4288, *Geometrical Product Specifications (GPS) — Surface texture: Profile method — Rules and procedures for the assessment of surface texture*

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

ISO 6892-1, *Metallic materials — Tensile testing — Part 1: Method of test at room temperature*

ISO 7870-1, *Control charts — Part 1: General guidelines*

ISO 7870-2, *Control charts — Part 2: Shewhart control charts*

ISO 7870-3, *Control charts — Part 3: Acceptance control charts*

ISO 7961, *Aerospace — Bolts — Test methods*

ASTM E112:2004, *Standard Test Methods for Determining Average Grain Size*

3 Terms and definitions

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

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

— IEC Electropedia: available at <http://www.electropedia.org/>

— ISO Online browsing platform: available at <http://www.iso.org/obp>

3.1

batch

quantity of finished parts, manufactured using the same process, from a single material cast (single heat of alloy), having the same definition document number, diameter, 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 having the same definition document number

3.3

definition document

document specifying directly or indirectly all the requirements for products

Note 1 to entry: The definition document may 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

longitudinal open surface defect

3.6

lap

surface defect caused by folding over metal fins or sharp corners and then forming 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 may 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 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)].

Note 2 to entry: Ac = acceptance number (supplementary information taken from 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

critical defect

defect that, according to judgement and experience, is likely to result in hazardous or unsafe conditions for individuals using, maintaining or depending upon the considered product, or that is likely to prevent performance of the function of a major end item

3.12

major defect

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

3.13**minor defect**

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

3.14**limiting quality****LQ**

<sampling plan> quality limit which 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](#) corresponds to a probability of acceptance of 10 %.

3.15**acceptable quality level****AQL**

maximum percent defective (or the 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 level, which in a sampling plan, corresponds to a specified but relatively high probability of acceptance.

4 Quality assurance**4.1 General**

The manufacturer shall be capable of providing a continuous production of bolts complying with the quality requirements specified in this document. It is recommended that the manufacturer implement a recognized quality management system.

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 with this document shall be maintained for a minimum period of 10 years.

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

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

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 may possibly be reduced, or the qualification granted, without inspection: any such decision shall be based on the results obtained on similar types and diameters of bolts provided that the design and manufacturing conditions are identical.

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