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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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 7961 was prepared by Technical Committee ISO/TC 20, *Aircraft and space vehicles*, Sub-Committee SC 4, *Aerospace fastener systems*.

Annexes A and B form an integral part of this International Standard. Annex C is for information only.

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Aerospace — Bolts — Test methods

1 Scope

This International Standard specifies test methods for bolts for aerospace constructions.

It is applicable whenever quoted in reference.

2 Normative reference

The following standard contains provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent edition of the standard indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 7500-1:1986, *Metallic materials — Verification of static uniaxial testing machines — Part 1: Tensile testing machines*.

3 Tests

3.1 Tensile test at ambient temperature

3.1.1 Apparatus

3.1.1.1 Test device (see figure 1).

The test device shall be centred such that the stress at four equi-spaced points around the test sample is uniform within 1 %, or such that the coaxiality between the bolt and the clearance holes is less than or equal to 0,025 mm to ensure the application of the tensile load along the axis of the bolt¹⁾.

Other types of device may be used provided they respect the requirements of figure 3.

3.1.1.1.1 Cups, fixed or removable, in conformity with figure 3, which specifies only functional requirements.

3.1.1.1.2 Test nut (free-running or self-locking) or **threaded part** (assuming the role of a nut), of sufficient strength to guarantee bolt failure.

3.1.1.2 Tapered spacer, placed under the head during the test, when required by the procurement specification or definition document to evaluate the effect of angularity. The minimum clearance between the hole and the bolt shank shall be 0,13 mm. At least 90 % of the bolt bearing area shall be supported by the spacer which shall have a diameter sufficient to support the width across the corners of the bolt. The tolerance on the hole diameter in the spacer shall be $\pm 0,05$ mm.

3.1.1.3 Washers, used under bolt heads or nuts only in the case outlined in 3.1.1.2.

3.1.1.4 Tensile or compressive test machine, depending on the fixture, capable of applying the test loads.

3.1.2 Procedure

3.1.2.1 Assemble the bolt in the test device (3.1.1.1) as shown in figure 1. Install the nut (3.1.1.1.2) as shown in figure 2. Place the complete assembly between the loading platens of the machine.

3.1.2.2 Apply the load specified in the procurement specification or definition document at the rate specified in table 1¹⁾, in a controlled way.

1) Calibration requirements: see ISO 7500-1:1986 and annex A of this International Standard.