

BSI Standards Publication

**Aerospace — Blind fasteners, threaded type, self-locking — Test method for locking torque**

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## National foreword

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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.

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**Aerospace — Blind fasteners,  
threaded type, self-locking — Test  
method for locking torque**

*Aéronautique et espace — Éléments de fixation borgnes, type fileté, à  
freinage interne — Méthode d'essai de couple de freinage*



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

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# Aerospace — Blind fasteners, threaded type, self-locking — Test method for locking torque

## 1 Scope

This document describes the locking torque test method for blind fasteners, threaded type. This test method is used to measure the locking torque of blind fasteners with internal thread and external sleeve. It is applicable to blind fasteners consisting out of four elements (drive nut, nut, sleeve and corebolt) having a cross recess at the top of the nut.

## 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 286-2](#), *Geometrical product specifications (GPS) — ISO code system for tolerances on linear sizes — Part 2: Tables of standard tolerance classes and limit deviations for holes and shafts*

ASME B107.300, *Torque instruments (Mechanical)*

## 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:

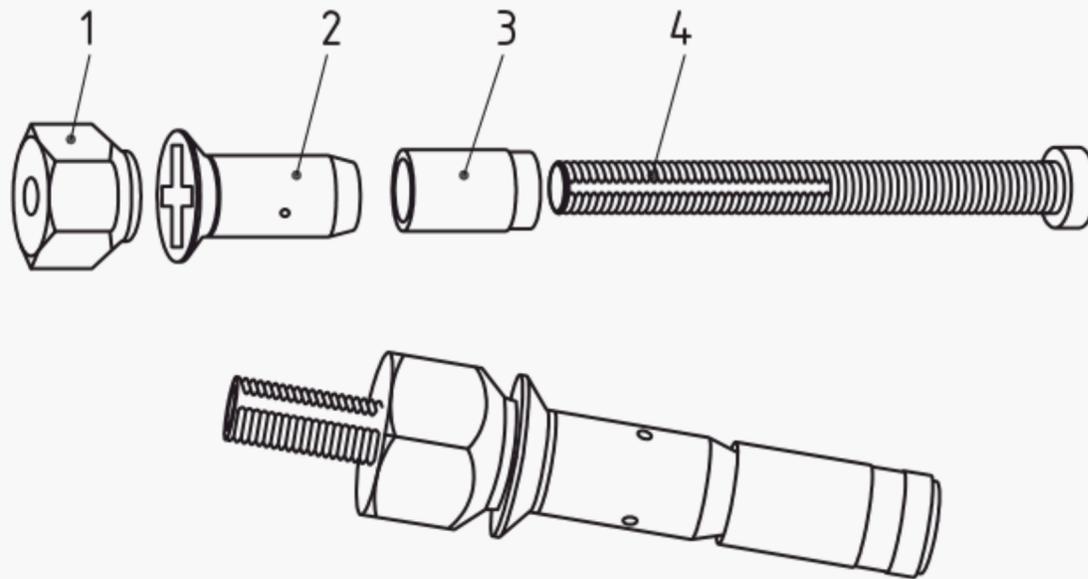
- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

### 3.1

#### **blind fastener, threaded type**

fastener which can be installed from only one side with an internal thread and external sleeve

Note 1 to entry: A blind fastener which can be tested with this document shall consist of four elements: drive nut, nut (with a cross recess), sleeve and corebolt, see [Figure 1](#).



**Key**

- |   |           |   |          |
|---|-----------|---|----------|
| 1 | drive nut | 3 | sleeve   |
| 2 | nut       | 4 | corebolt |

**Figure 1 — Blind fastener, threaded type**

**3.2**

**locking torque**

torque to be measured between nut and corebolt under no axial load at disassembly process after the blind fastener is installed

**4 General requirements**

**4.1 Test apparatus**

**4.1.1 Torque wrenches**

Torque wrenches shall be in accordance with ASME B107.300, Type I, Class A. Torque wrenches shall have been calibrated within 12 months prior to the test. Torque wrenches shall have an accuracy of  $\pm 4\%$ . The torque indicating scale of the torque wrenches shall be selected so that indicated torque readings are within 20 % and 90 % of the scale capacity. If the torque values are not within the limits, the test shall be repeated using an appropriate scale.

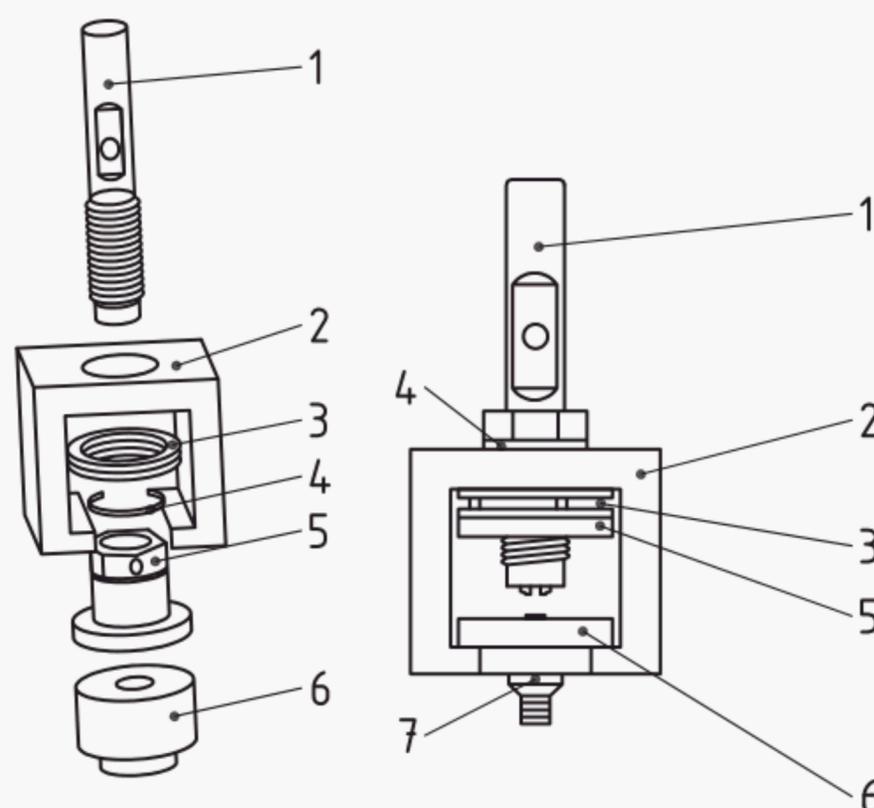
**4.1.2 Torsion machines**

Torsion machines shall have been calibrated 12 months prior to the test. Torsion machines shall have an accuracy of  $\pm 2\%$ . The torque indicating scale of the Torsion machine shall be selected so that indicated torque readings are within 20 % and 90 % of the scale capacity. If the torque values are not within the limits, the test shall be repeated using an appropriate scale.

**4.2 Test fixture**

The blind fastener shall be installed on the test coupon with a specific thickness in accordance with the product specification. Installation hole size of test coupon shall be in accordance with the product specification. If the hole size is not given in the product specification the installation hole size shall be equal to the nominal fastener diameter, tolerance H11 in accordance with [ISO 286-2](#).

A recommended test fixture is shown in [Figure 2](#).



**Key**

- |   |   |   |                             |
|---|---|---|-----------------------------|
| 1 | connecting rod bolt with a cross recess driver at the end | 5 | back nut                    |
| 2 | cradle  | 6 | test coupon                 |
| 3 | bearing   | 7 | blind fastener to be tested |
| 4 | retaining washer  |   |                             |

**Figure 2 — Test fixture**

## 5 Detail requirements

### 5.1 Test procedures

- Blind fastener with the required minimum relevant grip length shall be installed in accordance with the product specification until the fracture of corebolt; the blind side upset diameter shall exceed the minimum diameter, given in the product specification.
- Install the test coupon in the test fixture and fix the nut of the blind fastener with the connecting rod bolt in order to prevent it from rotating.
- Disassemble the blind fastener: test shall be run at a rate slow enough to prevent an excessive increase in temperature of the blind fastener when the torque wrenches were used. Test shall be run at the rate of 2 r/min to 4 r/min using a torsion machine. End load applied to the torque wrench shall be no more than necessary to maintain engagement of the wrenching surfaces.
- The recorded locking torque shall be in accordance with the blind fastener product specification. Continue disassembling the blind fastener until the nut is separated from the corebolt.

### 5.2 Experiment data processing

Record the angle and corresponding torque during the test and record the torque-angle curve, and the locking torque.

### **5.3 Test reports**

The test report shall include the following data:

- a) part number, lot identification and manufacturer of blind fastener;
- b) model, serial number and calibration date of test apparatus;
- c) minimum locking torque at disassembly process;
- d) results.



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