INTERNATIONAL STANDARD

ISO 10964

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1993-08-15

Adhesives — Determination of torque strength of anaerobic adhesives on threaded fasteners

Adhésifs — Détermination des couples fonctionnels sur des fixations filetées collées avec des adhésifs anaérobies

Reference number
ISO 10964:1993(E)

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.

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Adhesives — Determination of torque strength of anaerobic adhesives on threaded fasteners

1 Scope

The test method described in this International Standard is used to make comparative assessments of the securing or locking effect of anaerobic adhesives used in threaded assemblies. This method may be used for other types of adhesives, if considered suitable.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were 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 editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 291:1977, *Plastics — Standard atmospheres for conditioning and testing.*

ISO 898-1:1988, *Mechanical properties of fasteners — Part 1: Bolts, screws and studs.*

ISO 898-2:1992, *Mechanical properties of fasteners — Part 2: Nuts with specified proof load values — Coarse thread.*

3 Definitions

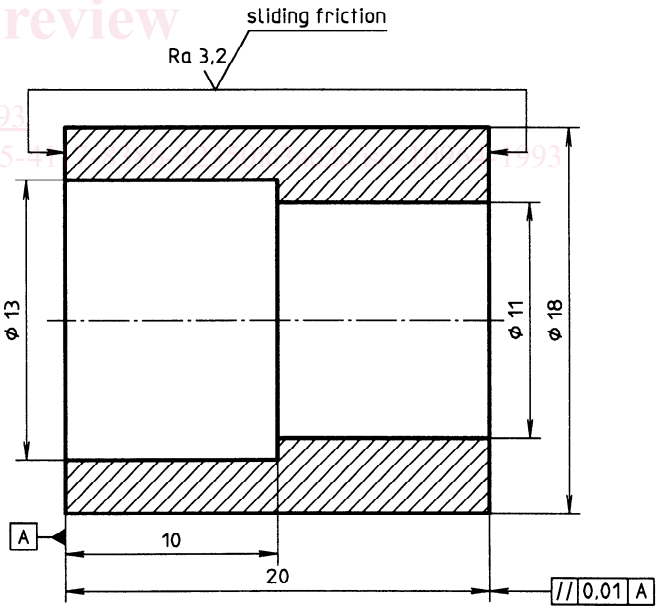
For the purposes of this International Standard, the following definitions apply.

3.1 on torque, T_{ON}: Maximum torque required to screw the nut onto a bolt precoated with adhesive.

3.2 input torque, T_{IN}: Torque applied to introduce or increase the axial load in the assembly. It is used to overcome friction in the thread and under the bolt head.

3.3 breakaway torque, T_{BA}: Initial torque required to break the bond measured at the first movement between the nut and the bolt, when unscrewing an unseated assembly (without spacer sleeve, see figure 1).

Dimensions in millimetres
General tolerances ± 0,2 mm
Roughness value in micrometres



47 HRC to 50 HRC hardness carbon steel.
Surface condition: corrosion and grease-free.

Figure 1 — Spacer sleeve

3.4 breakloose torque, T_{BL}: Initial torque required to decrease or eliminate the axial load in a preloaded assembly.

3.5 prevailing torque, T_P: Torque measured after the initial breakage of the bond at a specified angle of rotation of the nut. For testing against a specification, the angle shall be 180°.

NOTES

1 A round-robin test program, recently performed, showed there is no significant difference between prevailing torque measured at 180° and prevailing torque determined as the mean of the four torque readings determined at 90°, 180°, 270° and 360°.

2 For quality control or purposes other than testing the adhesive against a specification, other angles may be agreed between the manufacturer and the purchaser of the adhesive.

If prevailing torque is measured at an angle other than 180°, the angle shall be denoted by a subscript; i.e. T_{360}. Otherwise, prevailing torque measured at 180° shall be designated by T_P.

NOTE 3 The prevailing torque can be defined as T_{max} when not testing to a specification, T_{max} being the maximum torque measured within the first 360° rotation of the nut after the initial breakage of the bond.

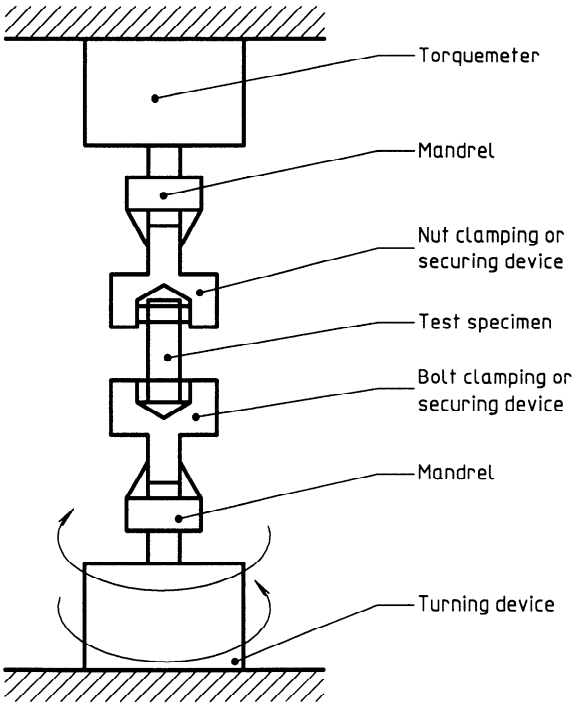


Figure 2 — Example of test apparatus with graphic recording

4 Principle

The test method consists of determining the torque required to unscrew a bonded nut and bolt assembly, including the initial torque required to break the bond, and the torque measured after turning the nut 180°. The torque strengths are determined for unseated assemblies and for seated assemblies preloaded with a specified input torque.

5 Apparatus

5.1 Test machine with graphic recording, consisting of a clamping device to secure the bolt head, a device for turning the nut at a constant speed, a torque-measuring device (see figure 2) and a recorder with a response time of 1 ms or less.

If a recorder is not used, a data storage system shall be employed so that the torque data as a function of the angle of turning can be recalled and plotted at a later time.

5.2 Test machine with direct reading, consisting of a clamping device to secure the head of the bolt, and a torque wrench accurate to ± 5 % (see figure 3).

6 Test specimens

6.1 For testing against a specification, the test specimen shall be an M10 × 38, property class 8.8, zinc-phosphated steel bolt and a similar M10 nut, specified in ISO 898-1 and ISO 898-2.

NOTE 4 Any size and surface finish of fastener combination may be used by agreement between the interested parties.

All fasteners used in unseated assemblies shall have a radial gap of 0,1 mm to 0,2 mm on the minor diameter. The cutting oil used in their manufacture shall be lanolin-free.

6.2 Degrease all nuts and bolts in a permitted cleaning medium, store in a desiccator at 23 °C ± 2 °C, and keep them clean. Use degreased specimens within four days or discard.

6.3 The specimens shall be conditioned and tested in one of the standard laboratory atmospheres specified in ISO 291, which shall be stated in the test report.

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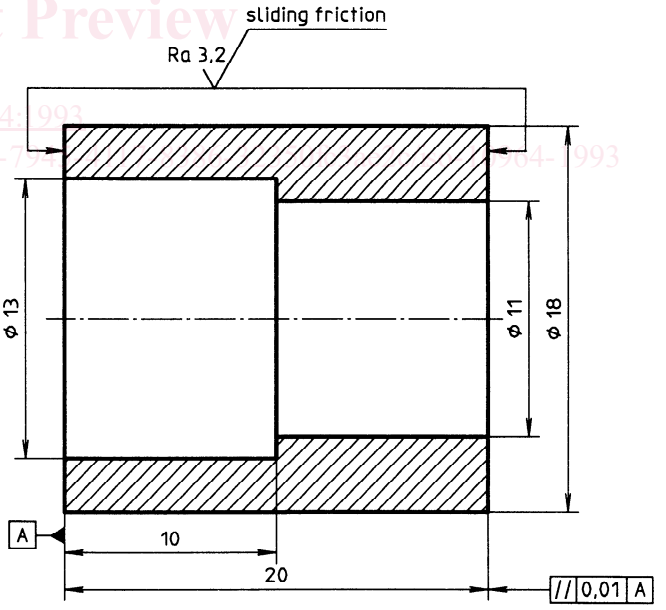

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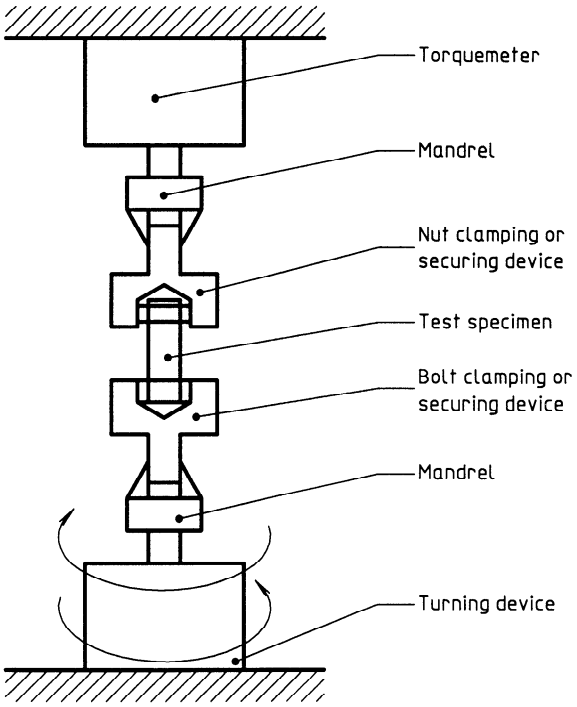

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