SLOVENSKI STANDARD
kSIST FprEN 14869-1:2010

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Konstrukcijska lepila - Določanje strižnih lastnosti konstrukcijskih spojev - 1. del: Torzijski preskus z uporabo čelno lepljenih votlih cilindrov (ISO 11003-1:2001, spremenjen)

Structural adhesives - Determination of shear behaviour of structural bonds - Part 1: Torsion test method using butt-bonded hollow cylinders (ISO 11003-1:2001 Modified)

Strukturklebstoffe - Bestimmung des Scherverhaltens struktureller Klebungen - Teil 1: Torsionsprüfverfahren unter Verwendung stumpf verklebter Hohlzylinder (ISO 11003-1:2001, modifiziert)

Adhésifs structuraux - Détermination du comportement en cisaillement de collages structuraux - Partie 1 : Méthode d'essai en torsion de cylindres creux collés bout à bout (ISO 11003-1:2001 Modifié)

Ta slovenski standard je istoveten z: **FprEN 14869-1**

ICS:

83.180	Lepila	Adhesives

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If this draft becomes a European Standard, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

This draft European Standard was established by CEN in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN Management Centre has the same status as the official versions.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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Foreword

This document (FprEN 14869-1:2010) has been prepared by Technical Committee CEN/TC 193 “Adhesives”, the secretariat of which is held by AENOR.

This document is currently submitted to the Unique Acceptance Procedure.

This document will supersede EN 14869-1:2004.

SAFETY STATEMENT — Persons using this document should be familiar with the normal laboratory practice, if applicable. This document does not purport to address all of the safety problems, if any, associated with its use. It is the responsibility of the user to establish appropriate safety and health practices and to ensure compliance with any regulatory conditions.

ENVIRONMENTAL STATEMENT — It is understood that some of the material permitted in this standard may have negative environmental impact. As technological advantages lead to acceptable alternatives for these materials, they will be eliminated from this standard to the extent possible.

At the end of the test, the user of the standard should take care to carry out an appropriate disposal of the wastes, according to local regulation.

1 Scope

This European Standard specifies a shear test for the characterization of adhesives in a bond. The shear stress/strain properties of the adhesive (including the shear modulus) are useful for advanced design work, e.g. in finite element analysis methods.

2 Normative references

The following referenced documents are indispensable for the application 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.

EN 923:2005+A1:2008, *Adhesives — Terms and definitions*

EN 13887, *Structural Adhesives — Guidelines for surface preparation of metals and plastics prior to adhesive bonding*

EN ISO 291, *Plastics — Standard atmospheres for conditioning and testing (ISO 291:2008)*

EN ISO 10365, *Adhesives — Designation of main failure patterns (ISO 10365:1992)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 923:2005+A1:2008 apply.

4 Principle

The shear deformation of the adhesive in an annular bond between two hollow cylinders, and the corresponding torque, are measured and recorded up to failure of the joint.

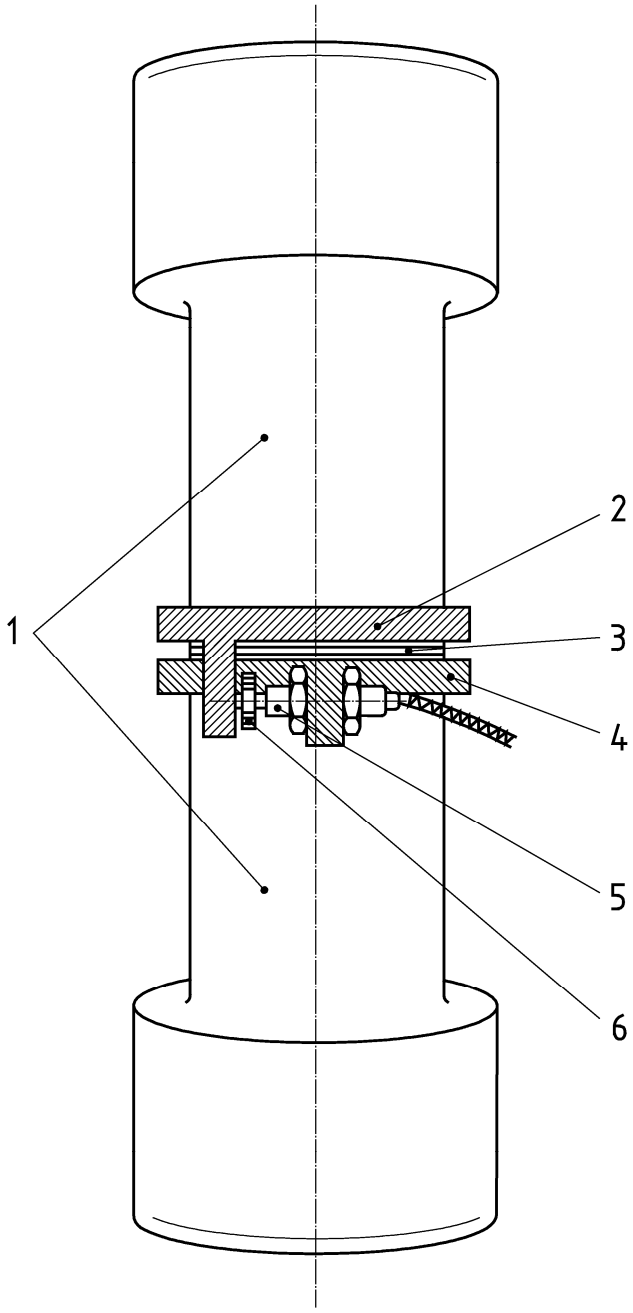
5 Apparatus

5.1 Torsion-testing machine, with a capacity of at least 300 N·m and preferably of 1 000 N·m.

Alternatively, a suitably adapted tensile-testing machine may be used. The machine shall include equipment for recording the torque instantaneously with an error of less than 1 %. The gripping heads shall be accurately aligned and, if no hydraulic gripping mechanism is available, all bolts and holes shall be precisely machined so that the specimens are mounted in the apparatus and tested free of uncontrolled loads. The machine shall be equipped with an adequately thermostatted chamber if tests are to be carried out at temperatures different from the ambient temperature.

5.2 Displacement sensor (see Figure 1), capable of measuring, as near as possible to the bond line, the displacement of the two adherends relative to each other and hence the deformation of the adhesive.

The sensor and its associated target shall be rigidly mounted on the two adherends as shown in Figure 1. The range of the displacement-measuring equipment shall be adjustable to permit the full-scale reading to be varied between 2 µm and 1 000 µm. The equipment shall be capable of measuring displacements to an accuracy of ± 1 µm. The sensor shall be of lightweight and robust construction since it is subjected to high accelerations on failure of the specimen.



Key

1 Adherends
2 Target support (on upper adherend)
3 Butt joint
4 Sensor support (on lower adherend)
5 Displacement sensor
6 Target

Figure 1 — Adhesive-layer specimen with displacement sensor mounted in the test apparatus

6 Test specimen

6.1 Preparation

6.1.1 Substrate material

Aluminium alloy or steel are suitable materials for the adherends. Other materials are acceptable provided the material (including pre-treated surface layers) has a shear modulus at least ten times higher than that of the adhesive.

6.1.2 Preparation of the surface

The surfaces to be bonded shall be prepared in accordance with EN 13887 or by any method leading to a cohesive failure within the adhesive layer.

6.1.3 Bonding

Prepare the specimens in accordance with the instructions of the manufacturer of the adhesive. Information about conditioning of the specimen shall be included in the test report.

A joint completely filled with adhesive is essential for the reliability of the test. The two adherends shall be bonded coaxially, with a maximum lateral displacement between their two axes of 0,002 r_o (= outer radius), and a maximum angular deviation so that the bond line thickness varies by no more than 5 % of the recommended thickness. The joining device shall prevent the adhesive from running out of the joint and any displacement of the two adherends during curing.

NOTE To achieve this, the two hollow cylinders may be aligned with the help of a plug made of polytetrafluoroethylene (PTFE) or any other suitable device. A temperature-resistant O-ring, inserted into the PTFE plug and placed just below the bond, stops the adhesive from running out of the joint. At the other ends of the adherends, two plates fastened to a threaded rod passing through the PTFE plug prevent any displacement during curing (see Figure 2).