



SLOVENSKI STANDARD
SIST EN 15337:2009
01-februar-2009

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Adhesives - Determination of shear strength of anaerobic adhesives using pin-and-collar specimens (ISO 10123:1990 modified)

Klebstoffe - Bestimmung der Scherfestigkeit von anaeroben Klebstoffen unter Verwendung von Nadel- und Ringprobekörpern (ISO 10123:1990 modifiziert)

Adhésifs- Détermination de la résistance au cisaillement des adhésifs anaérobies sur assemblage type axe-bague (ISO 10123:1990 modifiée)

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Ta slovenski standard je istoveten z: EN 15337:2007

ICS:

83.180 Lepila Adhesives

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EUROPEAN STANDARD

EN 15337

NORME EUROPÉENNE

EUROPÄISCHE NORM

September 2007

ICS 83.180

English Version

Adhesives - Determination of shear strength of anaerobic adhesives using pin-and-collar specimens (ISO 10123:1990 modified)

Adhésifs - Détermination de la résistance au cisaillement des adhésifs anaérobies sur assemblage de type axe-bague (ISO 10123:1990 modifiée)

Klebstoffe - Bestimmung der Scherfestigkeit von anaeroben Klebstoffen unter Verwendung von Bolzen-Hülse-Probekörpern (ISO 10123:1990 modifiziert)

This European Standard was approved by CEN on 28 July 2007.

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This European Standard exists 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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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Foreword

This document (EN 15337:2007) has been prepared by Technical Committee CEN/TC 193 “Adhesives”, the secretariat of which is held by AENOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by March 2008, and conflicting national standards shall be withdrawn at the latest by March 2008.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

Safety statement

Persons using this document should be familiar with the principles of normal laboratory practices. 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 ensure compliance with any regulatory conditions.

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EN 15337:2007 (E)

1 Scope

This European Standard specifies a method for the determination of the shear strength of anaerobic-curing liquid adhesives used for retaining cylindrical assemblies pin-and-collar type, or for locking and sealing threaded fasteners.

This test method may also be used for other adhesives.

The test is for ranking and quality control of adhesives. The result does not necessarily reflect the performance of the materials in service and the test is not suitable for providing numerical data for design purposes.

NOTE Numerical design data may be obtained from tests using the materials and configurations used in the actual structure.

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 ISO 7500-1, *Metallic materials – Verification of static uniaxial testing machines – Part 1: Tension/compression testing machines – Verification and calibration of the force-measuring system (ISO 75001:2004)*

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3 Principle

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The force required to shear the adhesive joint formed between a metal pin and a metal collar is determined. The static shear strength is calculated from this force.

4 Apparatus

4.1 Universal testing machine, complying with EN ISO 7500-1, class 1.

The machine shall be able to apply a compressive force directly or indirectly. An example of a jig for compression testing for use on a pure tensile testing machine is shown in Annex A.

4.2 Test specimen support, made of hardened steel, as shown in Figure 1, for positioning the test specimen on the universal testing machine.

4.3 Non-adhering material sheet (e.g. polyethylene sheet).

5 Preparation of test specimens

5.1 General

Assemble no less than five specimens for each test as described below.

5.2 Each specimen shall be comprised of a pin of diameter $(20 \begin{smallmatrix} -0,020 \\ -0,041 \end{smallmatrix})$ mm and a slip collar $(20 \begin{smallmatrix} 0,021 \\ 0 \end{smallmatrix})$ mm in inside diameter and $18 \text{ mm} \pm 0,05 \text{ mm}$ in width, both components being finished to $0,8 \text{ } \mu\text{m}$ to $1,6 \text{ } \mu\text{m}$ (see Figure 2). The material used for the collar and pin shall be stated in the test report.

NOTE Unless there is a specific requirement to test the adhesive with a specific material, low-grade carbon-steel (complying with grade 2 of ISO 683-9) is generally used and has been found to be satisfactory.

The cutting oil used in the manufacture of specimens and any corrosion protection agent shall be completely soluble in the solvents used for degreasing at room temperature and shall contain no lanolin.

5.3 Clean all pins and collars with suitable cleaning agents to degrease them and allow them to dry. The cleaning agents used shall not leave any visually detectable residue on the surface. Allow the pins and collars to attain (23 ± 2) °C for at least 30 min before proceeding further with assembling, or store them in a desiccator at (23 ± 2) °C. When stored use degreased specimens within four days or discard (oxidation affects the test results after this period of time). In any case, take precautions to avoid contamination in subsequent handling. Do not prime or activate unless specified for the material to be tested (if the specimen is primed or activated, state this in the test report).

5.4 Pre-assemble pins and collars before application of the adhesive, to ensure a smooth and sliding fit.

Disassemble the parts. Apply sufficient adhesive to the surface of each pin, beginning at one end, to completely cover a length corresponding to the width of the collar in its final position. Also apply sufficient adhesive to completely cover the interior of the collar.

Slip the collar over the pin completely, with a helicoidal back-and-forth movement (this operation shall not take longer than 6 s).

5.5 Place the assembly vertically with the fillet upwards on a non-adhering material (e.g. polyethylene sheet) (Figure 3). Take care that the assembly is at the required temperature, and do not place on a hot or cold surface.

5.6 Before application of the adhesive, an activator may be applied as recommended by the manufacturer.

5.7 Cure the adhesive in accordance with the manufacturer's instructions. At the end of the curing period, remove by wiping excess of uncured material from the surfaces of the pin-and-collar assemblies.

6 Procedure

After allowing for cure and any predetermined environmental conditioning, determine the static shear strength as follows: Place the pin-and-collar assembly in the steel specimen support and place the support on the test device (see Figure 4). Load the specimen smoothly using a constant crosshead speed between 1 mm/min and 2 mm/min.

Record the maximum load in Newtons. Calculate the static shear strength τ , expressed in Megapascals, using the equation:

$$\tau = F/A \quad (1)$$

where

F is the maximum load, in Newtons;

A is the bond area, in square millimetres.

Test no fewer than five specimens. The bond area shall be calculated from the dimensions of the pin-and-collar assembly given in Figure 3, while the effective bond length derives to 16 mm from the nominal collar width by subtracting the length of both chamfers.

EN 15337:2007 (E)**7 Precision**

The precision of this test method is not known because inter-laboratory data are not available.

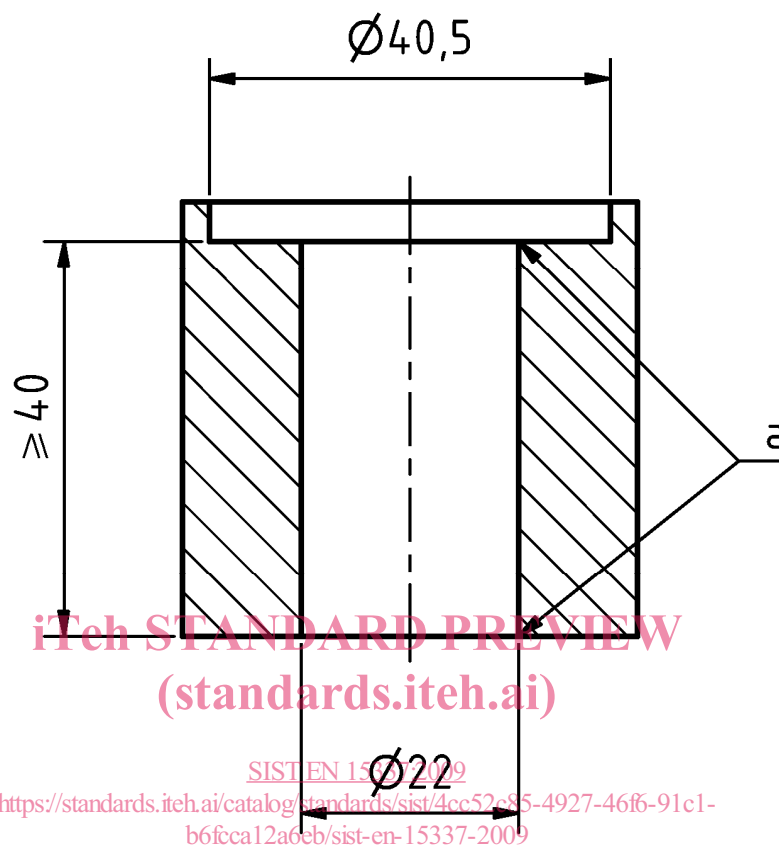
8 Test report

The test report shall include the following information:

- a) reference to this European Standard (EN 15337:2007);
- b) complete identification of the adhesive tested, including type, form, source, date manufactured and manufacturer's code number;
- c) complete identification of the material used and the method of cleaning and surface preparation prior to bonding;
- d) adhesive-application and bonding conditions used in preparing the specimens;
- e) conditioning procedure used for the specimens prior to testing;
- f) number of specimens tested;
- g) crosshead speed;
- h) average value of the maximum load and the standard deviation, as well as the average value and the standard deviation of the shear strength.

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Dimensions in millimetres

**Key**

a Chamfers 0,5 x 45 °

Figure 1 — Test specimen support