



SLOVENSKI STANDARD
SIST EN 14173:2002
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Številka: SIST EN 14173:2002

Structural adhesives - T-peel test for flexible-to-flexible bonded assemblies (ISO 11339:1993 modified)

Strukturklebstoffe - T-Schälprüfung für geklebte Verbindungen aus flexiblen Füge­teilen (ISO 11339:1993, modifiziert)

Adhésifs structuraux - Essai de pelage en T d'assemblages collés flexibles-sur-flexibles (ISO 11339:1993 modifiée)

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Ta slovenski standard je istoveten z: **EN 14173:2002**

ICS:

83.180 Lepila Adhesives

SIST EN 14173:2002 **en**

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 14173

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ICS 83.180

English version

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Strukturklebstoffe - T-Schälprüfung für geklebte Verbindungen aus flexiblen Füge-teilen (ISO 11339:1993, modifiziert)

This European Standard was approved by CEN on 11 November 2001.

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. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Management Centre or to any CEN member.

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 Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
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Foreword

This European Standard 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of an identical text or by endorsement, at the latest by July 2002, and conflicting national standards shall be withdrawn at the latest by July 2002.

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

Endorsement notice

The text of the International Standard ISO 11339:1993 was approved by CEN as a European Standard with agreed common modifications as given below :

- the title, has been modified ;
- the normative references have been updated ;
- A "Safety" clause has been introduced.

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EN 14173:2002 (E)**1 Scope**

This ~~European International~~ Standard specifies a 480° T-peel test for the determination of the peel strength of an adhesive by measuring the peeling force of a T-shaped bonded assembly of two flexible adherends.

NOTE This method was originally developed for use with metal adherends, but other flexible adherends may also be used.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

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

~~ISO 472:1988, *Plastics – Vocabulary.*~~

EN 923:1998, *Adhesives – Terms and definitions.*

prEN 13887, *Structural adhesives – Guidelines for surface preparation of metals and plastics prior to adhesive bonding.*

~~ISO 4588:1989, *Adhesives – Preparation of metal surfaces for adhesive bonding.*~~

EN 29142, *Adhesives – Guide to the selection of standard laboratory ageing conditions for testing bonded joints (ISO 9142:1990).*

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

3 Terms and definitions

For the purposes of this ~~European International~~ Standard, the following terms and definitions given in EN 923 ISO 472 and the following terms and definitions apply.

3.1 peel strength

force per unit width necessary to bring an adhesive joint to the point of failure and/or to maintain a specified rate of failure by means of a stress applied in the peeling mode

NOTE The peel strength can be expressed as force per unit peel width.

[EN 923:1998, 2.7.16] [ISO 472]

3.2 flexible adherends

adherends having dimensions and physical properties that permit bending through any angle up to 90° without breaking or cracking

4 Principle

For the 480° T-peel test for a flexible-to-flexible assembly, the force is applied to the unbonded ends of the specimen. The angle between the bond line and the direction of the applied force is not fixed.

Adherends are separated at an approximately steady rate from an open edge of a prepared bond, so that separation occurs progressively along the bond line.

5 Safety

Persons using this standard shall be familiar with normal laboratory practice.

This standard does not purport to address all the safety problems, if any, associated with its use.

It is the responsibility of the user to establish safety and health practices and to ensure compliance with any European or national regulatory conditions.

6 Apparatus

6.1 Tensile testing machine ¹⁾, capable of maintaining a predetermined constant crosshead rate (preferred rate 100 mm/min). It shall be provided with a suitable self-aligning grip to hold the specimen. Each set of jaws of the grip shall firmly engage the outer 25 mm of one of the unbonded ends of the flexible adherend. The grip and attachments shall be constructed in such a way that they will move into alignment with the specimen as soon as the force is applied. The machine shall produce a chart that can be read in terms of millimetres of crosshead movement as a function of the applied force.

The machine shall permit the measurement and recording of the applied force with an accuracy of $\pm 2\%$. All equipment shall be calibrated regularly. It is recommended that inertia-free equipment be used for this test.

6.2 Device for measuring thickness, with an accuracy of $\pm 0,01$ mm or a means of controlling the thickness to that tolerance.

7 Test specimens

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7.1 Test specimens of the dimensions shown in Figure 1 shall be prepared, either individually or cut from bonded laminates. Individual test specimens shall consist of two flexible adherends properly prepared and bonded together.

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7.2 Surface treatment shall be such as to obtain optimum strength in the bonded assembly. The preparation of the surface shall be in accordance with either the adhesive manufacturer's instructions or prEN 13887 ISO 4588 in the case of metal substrates, and the preparation shall be stated in the test report.

The adhesive shall be applied in accordance with the manufacturer's instructions to obtain an optimum bond with minimum variation ; the procedure shall be reported in the test report.

NOTE Direct comparison of different adhesives can be made only when specimen construction, adherend materials and dimensions, and test conditions are identical.

7.3 The thickness of the flexible adherends shall be reported.

NOTE The preferred thicknesses are 0,5 mm \pm 0,02 mm for steel and 0,5 \pm 0,02 mm or 0,7 mm \pm 0,02 mm for aluminium unless otherwise specified.

7.4 Test specimens shall be cut from the bonded panels (see Figure 1) by a method that is not deleterious to the bond.

The width shall be either :

a) 25 mm (preferred width) ;

or

b) any other convenient width, provided that the test equipment is suitably adapted and the width is stated in the test report.

1) See for instance ISO 5893:-, *Rubber and plastics test equipment – Tensile, flexural and compression types (constant rate of traverse) – Description.*

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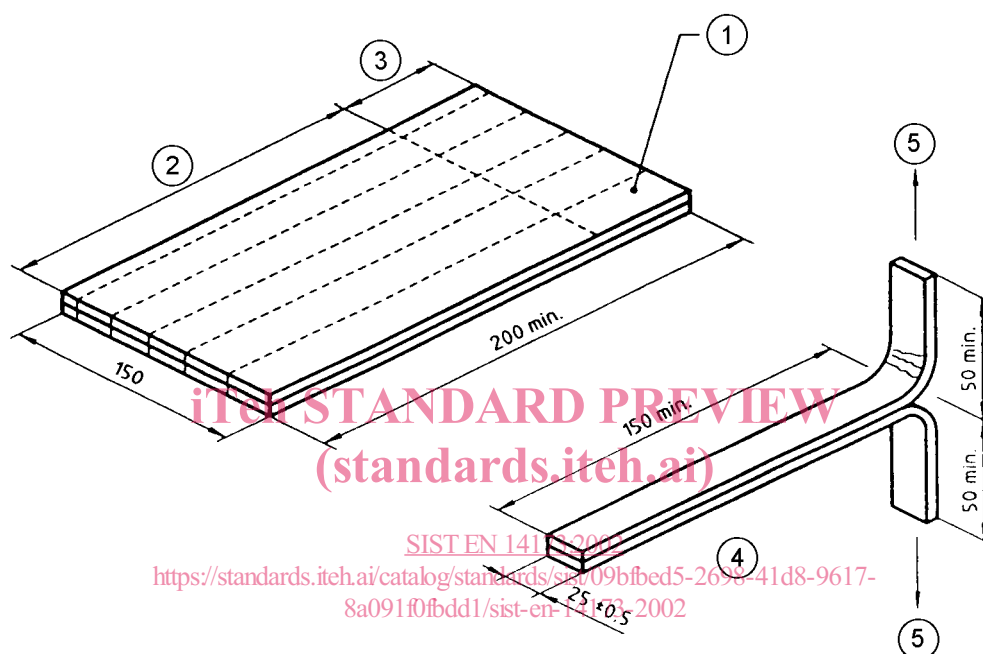
NOTE The method of cutting the specimens is dependent upon the adherend and adhesive compositions and the specimen width tolerance specified in Figure 1. Circular sawing and bandsawing are two methods commonly used for this purpose.

7.5 The two unbonded ends of the flexible adherends shall be bent in opposite directions until each end is perpendicular to the bonded assembly, to form a T-shaped specimen (see Figure 1) for clamping in the grips of the testing machine.

7.6 The number of specimens tested shall be not less than five.

7.7 The specimens shall be conditioned and tested in one of the standard laboratory atmospheres specified in EN 29142 ~~ISO 291~~, which shall be reported in the test report.

Dimensions in millimetres

**Key**

- 1 Specimen cut at panel edge
- 2 150 min. (bonded)
- 3 50 min. (unbonded)
- 4 Specimen
- 5 Direction of pull

Figure 1 — Panel before cutting and individual specimen after cutting

8 Test procedure

On at least five specimens, using the device described in 6.2, measure with an accuracy of $\pm 0,01$ mm the average thickness of the adhesive layer after formation of the bond.

Clamp each unbonded end of the T-shaped specimen in the grips of the testing machine (6.1), taking care that the end is accurately aligned between the grips, so that the tension applied is distributed evenly across the width. If one adherend is more flexible than the other, attach the less flexible adherend to the moveable grip.

Set the machine in motion at the selected separation rate, and record the force applied versus the distance of grip separation.

NOTE A separation rate of 100 mm/min is generally used for metals and 10 mm/min for other adherends.