



SLOVENSKI STANDARD SIST EN 1392:1999

01-maj-1999

Adhézivni spojevi za kožo in obutvene materiale - Toplotno raztopljivi in disperzijski spojevi -
Metode preskušanja za merjenje trdnosti spojev pod določenimi pogoji

Adhesives for leather and footwear materials - Solvent-based and dispersion adhesives -
Test methods for measuring the bond strength under specified conditions

Klebstoffe für Leder und Schuhwerkstoffe - Lösemittel- und Dispersionsklebstoffe -
Prüfverfahren zur Messung der Festigkeit von Klebungen unter festgelegten
Bedingungen

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Adhésifs pour cuir et matériaux de la chaussure - Adhésifs à base de solvants ou à
dispersion - Méthodes d'essai de la résistance pour mesurer la résistance de collage
dans certaines conditions spécifiées

Ta slovenski standard je istoveten z: EN 1392:1998

ICS:

61.060	Obuvala	Footwear
83.180	Lepila	Adhesives

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EUROPEAN STANDARD

EN 1392

NORME EUROPÉENNE

EUROPÄISCHE NORM

February 1998

ICS 61.060; 83.180

Descriptors: adhesives, footwear, materials, leather, rubber, polyvinyl chloride, bonding, destructive test, bond strength, peel test, shear test, creep test at elevated temperature, test method, testing conditions, classification

English version

Adhesives for leather and footwear materials - Solvent-based and dispersion adhesives - Test methods for measuring the bond strength under specified conditions

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Klebstoffe für Leder und Schuhwerkstoffe - Lösemittel- und Dispersionsklebstoffe - Prüfverfahren zur Messung der Festigkeit von Klebungen unter festgelegten Bedingungen

This European Standard was approved by CEN on 24 January 1998.

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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

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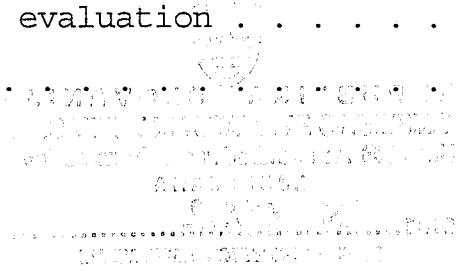
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Foreword

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 August 1998, and conflicting national standards shall be withdrawn at the latest by August 1998.

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, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

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1 Scope

This Standard specifies test methods to measure some strength properties of bonds of leather and footwear materials, in stuck-on assemblies using solvent-based and dispersion adhesives, under different conditions. These can be chosen taking into account the different stresses that such bonds are subjected to, depending on the type of footwear, under different external conditions in service.

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.

EN 923	Adhesives - Terms and definitions
EN 1066	Adhesives - Sampling
EN 1067	Adhesives - Examination and preparation of samples for testing
EN 10002-2	Metallic materials - Tensile testing - Part 2: Verification of the force measuring system of the tensile testing machines
EN 29142	Adhesives - Guide to the selection of standard laboratory ageing conditions for testing bonded joints (ISO 9142:1990)
EN ISO 10365	Adhesives - Designation of main failure patterns (ISO 10365:1992)
ISO 554	Standard atmospheres for conditioning and/or testing - Specifications
ISO 868	Plastic and ebonite - Determination of indentation hardness by means of a durometer (Shore hardness)
ISO 2602	Statistical interpretation of test results - Estimation of the mean - Confidence interval

3 Definitions

For the purposes of this standard, the definitions in accordance with EN 923 and the following definitions apply:

3.1 leather: Tanned animal skin, usually free of hair [EN 1391].

3.2 footwear materials: Natural and synthetic materials which are suitable for footwear manufacture or repair and have adequate wear properties as upper or sole material [EN 1391].

3.3 adhesives for leather and footwear materials: Adhesives which are intended to produce firm and durable bonds with leather and footwear materials.

4 Principle

The surface of the leather or the footwear material used shall be treated specifically to the nature of the material. Strips of specified length and width shall be cut from the treated material.

Two of these strips or one strip of the above mentioned material together with one strip of a suitable different material shall be bonded by an adhesive to test pieces of specified form.

The test pieces shall be stored under specified conditions and their bond strength determined under specified conditions.

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 Test methods

6.1 Types of tests

6.1.1 Peel test at (23 ± 2) °C
See 6.4.2

6.1.2 Shear test at (23 ± 2) °C
See 6.4.3

6.1.3 Peel test under constant load and at a constant elevated temperature ("creep test")
See 6.4.4

6.2 Adhesives and materials

6.2.1 Footwear adhesive

The adhesive used shall be identified in the test report, in particular note name and/or designation, manufacturer, date of manufacture/supply and/or lot number, main polymer and colour. For two-part adhesives the nature of the crosslinking agent and the mixing ratio of the components shall be identified.

Reference footwear test adhesives are one or two-part adhesives with specified properties (e.g. Test adhesive CR 1, Test adhesive

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CR 2, Test adhesive PU 1, Test adhesive PU 2). The designation of the reference test adhesive, if used, shall be recorded in the test report.

6.2.2 Footwear materials

The footwear material(s) used in the test report shall be identified.

The name and/or designation, manufacturer, date of manufacture/supply, type of leather or of footwear material, e.g. soling or upper material shall be recorded. For leathers list colour, thickness and type of tannage (if known), for rubber and plastic materials colour, polymer base and Shore-hardness in accordance with ISO 868. The identification of this material shall be included in the test report.

Reference footwear test materials are footwear materials with specified properties (e.g. Test leather 1, Test leather 2, Test material SBR 1, Test material SBR 2, Test material NBR, Test material SBSR or Test material PVC). The designation of the reference footwear test materials, if used, shall be included in the test report.

6.3 Apparatus iTeh STANDARD PREVIEW

The items required shall depend on the types of materials used: <https://standards.iteh.ai/catalog/standards/sist/cfee7dc4-f95b-444a-a914-1c63720c3a97/sist-en-1392-1998>

6.3.1 Cutting knife

Sharp knife, for cutting test pieces in accordance with 6.6.2. The angle between the inner and outer cutting surface shall be approximately 20°.

6.3.2 Splitting machine

For splitting bottom leather.

6.3.3 Roughing machine

A rotary wire brush with a wire diameter between 0,1 mm and 0,4 mm. The linear speed of revolution shall be between 10 m/s and 25 m/s.

6.3.4 Scouring machine

A drum covered with emery paper or emery cloth of 40 grit size and a linear speed of revolution of between 10 m/s and 20 m/s.

6.3.5 Hard felt disc

Made from wool for removing thin polyvinyl chlorid (PVC), coats from PVC upper materials.

6.3.6 Hand brush

Mechanical device for removing the dust from strips of material, after roughing.

6.3.7 Material for solvent wiping

A lint free fabric or cotton wool unaffected by the solvent used of about 150 mm x 150 mm in size.

6.3.8 Solvents

Ethyl acetate or acetone and light petroleum, boiling range 80 °C to 110 °C.

6.3.9 Halogenation agent, solvent borne, 1- or 2-part

For treating rubber surfaces.

6.3.10 Brushes

Brush with a non-metallic bristle holder for halogenation and the bristle shall be (20 ± 5) mm long.

6.3.11 Adhesive applicator

Brush, roller, coating machine, etc. to apply a uniform coating of the adhesive under test.

6.3.12 Heat activator

For heating adhesive coats to the required temperature.

6.3.13 Equipment for measurement of temperature

Thermocouple, thermoindicator or melting powders for measuring the temperature of activated adhesive coats.

6.3.14 Pressing device

Providing an even pressure of up to 0,6 MPa over the whole of the surface to be bonded.

6.3.15 Tensile testing machine

For measuring maximum separation forces up to 10 kN and suitable force measurement ranges in accordance with class 2 of EN 10002-2.

To record automatically the separation forces determined, and adjustable to a constant rate of traverse of (100 ± 10) mm/min during the test.

6.3.16 Oven

With forced ventilation capable of storing test pieces at (50 ± 2) °C.

6.3.17 Warm air cabinet

With forced ventilation capable of maintaining the contents at temperatures between (40 ± 2) °C and (100 ± 2) °C and suitable for testing test pieces. The test cabinet shall be fitted with a window and devices for clamping five test pieces. These devices shall consist of upper clamps fixed on a metal bar in the cabinet and

lower clamps which shall have means for attaching weights which pass through cylindrical holes in the base of the cabinet. All lower clamps shall be of the same mass and capable of being loaded with weights so that total loads applied by the individual clamps are 0,5 kg, 1,0 kg, 1,5 kg, 2,0 kg and 2,5 kg.

6.3.18 Weights

For applying loads of 0,5 kg, 1,0 kg, 1,5 kg, 2,0 kg and 2,5 kg, (with a tolerance of $\pm 1\%$) including the weight of a clamp to the test pieces.

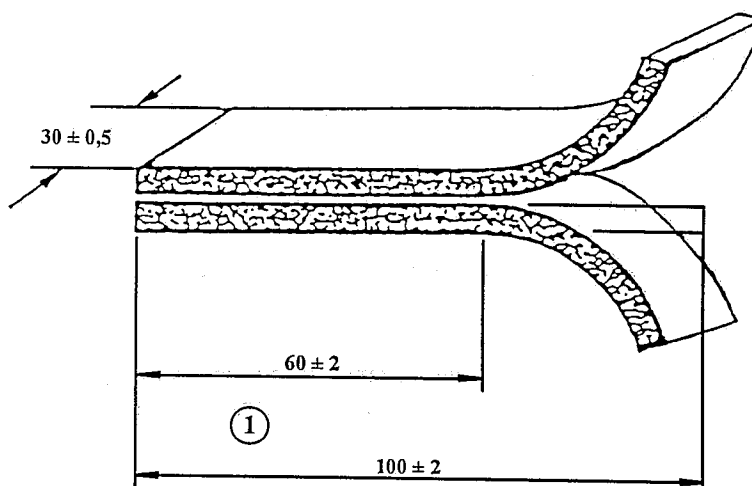
6.4 Form of test pieces

6.4.1 General

Prepare from the footwear materials, strips as specified in 6.6.1 to 6.6.3. Alternatively, if a material does not allow the cutting of strips of the required dimensions, smaller and/or shorter strips can be used for preparing test pieces of the specified form, subject to the recording of their dimensions and overlap in the test report.

6.4.2 Peel test at $(23 \pm 2) ^\circ\text{C}$

Bond two strips of material not greater than (100 ± 2) mm long and $(30 \pm 0,5)$ mm wide to cover each other over a length of at least (60 ± 2) mm (see figure 1).

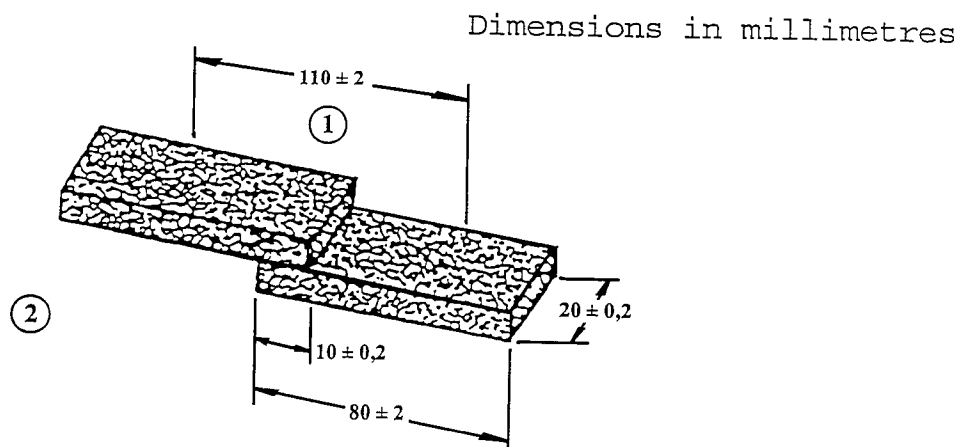


1 Length of the bond

Figure 1: Form and dimensions of test pieces for the peel tests

6.4.3 Shear test at $(23 \pm 2) ^\circ\text{C}$

Bond two strips of material, (80 ± 2) mm long and $(20 \pm 0,2)$ mm wide with an overlap of $(10 \pm 0,2)$ mm (see figure 2).



- 1 Test length
2 Shear section $\approx 200 \text{ mm}^2$

Figure 2: Form and dimensions of test pieces for shear tests

6.4.4 Peel test under constant load and at a constant elevated temperature ("creep test")

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Use the test pieces specified in 6.4.1

6.5 Number of test pieces

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Prepare for every test and storage condition chosen not less than three peel or three shear test pieces. For creep tests:

- 1) 15 test pieces for the preliminary tests necessary for assessing the test temperature (five for each preliminary test);
- 2) 15 test pieces for creep tests (five for the creep test at each chosen test weight)

6.6 Preparation of test pieces

6.6.1 General

Condition all leathers and footwear materials to an equilibrium state in the standard atmosphere 23/50 in accordance with ISO 554.

6.6.2 Cutting of material strips

When cutting the materials for test pieces, the surface that is to be bonded shall be uppermost. The inner surface of the knife shall be at right angles to the plane of the material to be cut. The depth of the cut shall be greater than the thickness of the material being cut.

NOTE: It is recommended that a thick sheet of paper be laid between the material and the cutting block.