SLOVENSKI STANDARD
SIST EN 1464:1998

01-februar-1998

Lepila - Določanje odpornosti proti odluščenju lepljenih stikov visoke trdnosti - Metoda s pomičnimi valji (ISO 4578:1990, spremenjen)

Adhesives - Determination of peel resistance of high-strength adhesive bonds - Floating roller method (ISO 4578:1990 modified)

Klebstoffe - Bestimmung des Schälwiderstandes von hochfesten Klebungen - Rollenschälversuch (ISO 4578:1990 modifiziert)

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Adhésifs - Détermination de la résistance au pelage des assemblages a forte cohésion - Méthode des galets mobiles (ISO 4578:1990 modifiée)

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Ta slovenski standard je istoveten z: **EN 1464:1994**

ICS:

83.180	Lepila	Adhesives

SIST EN 1464:1998 **en**

2003-01.Slovenski inštitut za standardizacijo. Razmnoževanje celote ali delov tega standarda ni dovoljeno.

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EUROPEAN STANDARD **EN 1464**

NORME EUROPÉENNE

EUROPÄISCHE NORM November 1994

ICS 83.180

Descriptors: plastics, adhesives, adhesive bonded joints; tests, adhesion tests, peel tests

English version

Adhesives - Determination of peel resistance of high-strength adhesive bonds - Floating roller method (ISO 4578:1990 modified)

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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.

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CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

Central Secretariat: rue de Stassart,36 B-1050 Brussels

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Foreword

This European Standard has been prepared by the Technical Committee CEN/TC 193 "Adhesives", the secretariat of which is held by AFNOR.

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of an identical text or by endorsement, at the latest by May 1995, and conflicting national standards shall be withdrawn at the latest by May 1995.

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

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1 Scope

This European Standard specifies a floating roller method for the determination of the peel resistance of high-strength adhesive bonds between one rigid adherend and one flexible adherend when tested under specified conditions of preparation and testing.

NOTE : The use the floating roller produces more constant numerical data than other peel methods, but it should not be expected that the flexible adherend will conform to the surface of the roller.

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 lastest edition of the publication referred to applies.

ISO 291	1977	Plastics - Standard atmospheres for conditioning and testing
ISO 4588		Adhesives - Preparation of metal surfaces for adhesive bonding[1)]
ISO 10365	1992	Adhesives - Designation of main failure patterns

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3 Definition

For the purposes of this Standard, the following definition applies :

peel resistance

The average force per unit test specimen width, measured along the bond line, required to separate progressively the two members of a bonded test specimen under specified conditions of test. It is expressed in kilonewtons per metre of width.

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1) Revision in progress.

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4 Apparatus

4.1 Tensile testing machine [2], capable of maintaining a pre-determined constant crosshead rate to be reported in the test report (preferred rate : 100 mm/min). It shall be provided with a suitable self-aligning grip to hold the test specimen. The jaws of this grip shall firmly engage the outer 25 mm of the end of the flexible adherend. The grip and attachments shall be so constructed that they will move into alignment with the test specimen as soon as the force is applied, so that the flexible member of the test specimen will coincide with the direction of the applied pull through the centre line of the grip assembly.

The machine shall be autographic, giving a chart that can be read in terms of millimetres of crosshead movement as one coordinate and applied force as the other coordinate. All equipment shall be calibrated regularly. It is recommended that inertialess equipment be used for this test.

The measured strength shall be between 10 % and 90 % of the capacity of the machine.

The machine shall permit the measurement and recording of the applied force with an accuracy of ± 1 %.

4.2 Peel test fixture, for supporting the test specimen (see figure 1). The fixture shall be attached to one of the cross-arms of testing machine (4.1). The 25 mm diameter rollers on the test fixture shall roll freely. The angle determined by the rollers and the use of dual roller bearings are critical and the rollers shall therefore be carefully maintained.

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5 Test specimens

5.1 Test specimens of the dimensions shown in figure 2 may be prepared individually or cut from bonded panels. Laminated test panels, or individual test specimens, shall consist of two adherends properly prepared and bonded together.

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2) See for instance ISO 5893:1985 "Rubber and plastics test equipment - Tensile, flexural and compression types (constant rate of traverse) - Description".

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5.2 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 ISO 4588 in case of metals or the adhesive manufacturer's instructions and shall be stated in the test report.

The adhesive shall be applied in accordance with the manufacturer's recommendations to obtain an optimum bond with minimum of variations.

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

5.3 The thickness of the flexible adherend shall be 0,5 mm $\pm$ 0,02 mm and that of the rigid adherend shall be 1,6 mm $\pm$ 0,1 mm in the case of metals, or thicker if other adherends are used in order the reduce the deformation of the rigid adherend.

5.4 Test specimens shall be cut from the bonded panels (see figure 2) by a means that is not deleterious to the bond.

The width shall be either :

a) 25 mm (the 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.

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NOTE : The method of cutting the test specimens is dependent upon the adherend and adhesive compositions and the tolerance specified in figure 2. Milling and band-sawing are two methods commonly used for this purpose.

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5.5 The unbonded end of the flexible adherend shall be bent perpendicular to the rigid adherend for clamping in the grip of the testing machine.

5.6 The number of specimens to be tested shall be as specified in the material specification or, if not so specified, shall be not less than five.

6 Conditioning and testing atmosphere

The test specimens shall be conditioned and tested in one of the standard laboratory atmospheres specified in ISO 291.

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7 Procedure

7.1 Insert the test specimen into the peel test fixture (4.2) as shown in figure 1, with the unbonded end of the flexible adherend gripped in the jaw of the testing machine (4.1). Peel the specimen at a constant crosshead separation rate of 100 mm/min ± 5 mm/min, unless otherwise specified. If the rigid adherend bends or is distorted during the test, it is recommended that the specimen be redesigned with a rigid adherend stiff enough to ensure even peeling.

7.2 During the peel test, make an autographic recording of force versus crosshead movement (force versus distance peeled) over a length of a least 115 mm of the bond line disregarding the first 25 mm of peel.

7.3 Disregard the results if failure occurs outside the peeling zone as defined in figure 1.

8 Expression of results

Determine from the autographic curve, for at least 115 mm of peeling (disregarding the first 25 mm and the last 20 mm), the average peeling force, in kilonewtons per metre of the test specimen width, required to separate the adherends. The average force may be determined from the curve by one of the following methods :

a) a planimeter ;

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b) a gravimetric method, as follows :

Cut out the area of the chard paper surrounded by the curve and the base line (abscissa) and weigh it. Determine the area by dividing its mass by the previously determine mass per surface area of the chart paper.

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Divide the area thus found by the length of the base line (corresponding to 80 mm peeling length), to obtain the average height of the curve (and hence the average peeling force) ;

c) by drawing the best straight line through the peeling curve using a straight edge ;

d) by any other method such as computer assisted.

Also record the maximum and minimum forces for each individual specimen.

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9 Test report

The test report shall include the following particulars :

a) a reference to this European Standard ;

b) identification of the adhesive tested, including type, source, manufacturer's code number, batch or lot number, form, etc. ;

c) identification of adherends, including materiel thickness, width and surface preparation ;

d) description of the bonding process, including method of application of adhesive, drying or pre-curing conditions (where applicable), and curing time, temperature and pressure ;

e) average thickness (as precisely as practicable) of the adhesive layer after formation of the bond ;

f) complete description of the test specimen, whether individual or panel, including dimensions and construction of the test specimen, conditions used for cutting individual test specimens, number of test panels represented and number of individual test specimens (when edge specimens are tested they shall be designated "edge specimens") ;

g) conditioning procedure prior to testing and the test conditions :

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h) if the crosshead separation rate is other than 100 mm/min, the actual crosshead separation used ;

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j) method of determining the average force ;

k) average, maximum and minimum peeling force values, in kilonewtons per metre of test specimen width, for each individual specimen (edge samples shall be reported separately) ;

l) type of failure according to with ISO 10365.

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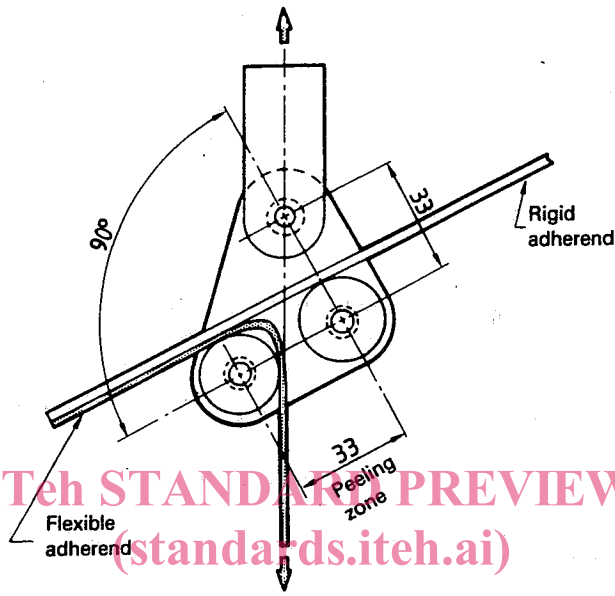
Dimensions in millimetres



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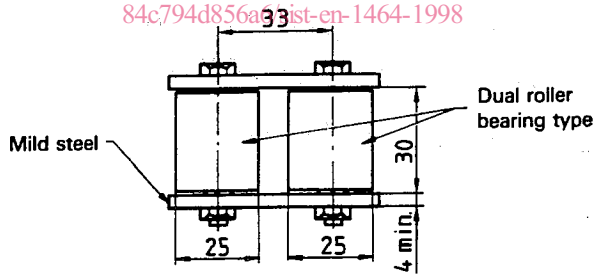

Figure 1 : Peel test fixture for supporting test specimen

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Dimensions in millimetres

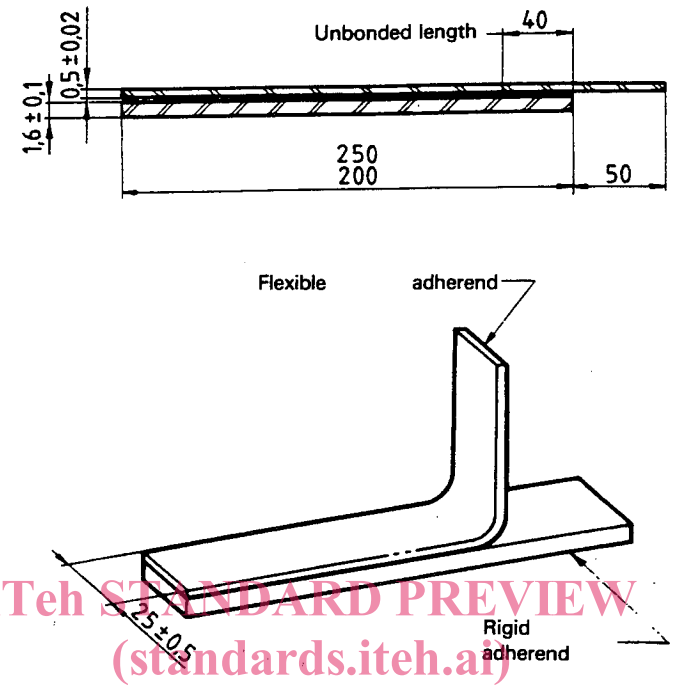

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Figure 2 : Test specimen