DEUTSCHE NORM October 1999

Test method for adhesives for floor and wall coverings

Peel test

English version of DIN EN 1372

DIN EN 1372

ICS 83.180

Klebstoffe – Prüfverfahren für Klebstoffe für Boden- und Wandbeläge – Schälversuch

European Standard EN 1372 : 1999 has the status of a DIN Standard.

A comma is used as the decimal marker.

National foreword

This standard has been prepared by CEN/TC 193.

The responsible German body involved in its preparation was the *Normenausschuß Materialprüfung* (Materials Testing Standards Committee), Technical Committee *Prüfung von Klebstoffen für Bodenbeläge, Wand- und Deckenbekleidung*.

DIN 50014 and DIN 50013 are the standards corresponding to International Standards ISO 554 and ISO 3205, respectively, referred to in clause 2 of the EN.

National Annex NA

Standards referred to

(and not included in **Normative references**)

DIN 50013 Artificial climates in technical applications – Preferred temperatures

DIN 50014 Artificial climates in technical applications – Standard atmospheres

EN comprises 9 pages.

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NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 1372

June 1999

ICS 83.180

English version

Adhesives

Test method for adhesives for floor and wall coverings

Peel test

Adhésifs – Méthode d'essais d'adhésifs pour revêtements de sols et muraux – Essai de pelage

Klebstoffe – Prüfverfahren für Klebstoffe für Boden- und Wandbeläge – Schälversuch

This European Standard was approved by CEN on 1999-05-06.

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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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Ref. No. EN 1372 : 1999 E

Contents

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of an identical text or by endorsement, at the latest by December 1999, and conflicting national standards shall be withdrawn at the latest by December 1999.

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.

1 Scope

This standard specifies a test method to measure the adhesion of a resilient or textile floor covering or wall covering bonded to a given substrate under peel forces. The term "wall covering" does not include any type of wallpaper.

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 29142:1993	Adhesives - Guide to the selection of standard laboratory ageing conditions for testing bonded joints (ISO 9142:1990)
ISO 554	Standard atmospheres for conditioning and/or testing - Specifications
ISO 3205	Preferred test temperatures

3 Definitions

For the purposes of this standard the following definitions and those given in EN 923, apply:

3.1 covering: Flexible resilient or textile floor covering or wall covering.

3.2 adhesives for coverings: Adhesives which are intended to produce firm and durable bonds between coverings and various substrates.

4 Principle

The adhesion is determined by measuring the resistance to peeling under specified conditions before and after storing the bonds at 23 ºC or 50 ºC 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 and national regulatory conditions.

6 Apparatus and material

6.1 Adhesive applicator, serrated blade with a notch size specified by the adhesive manufacturer (see figure 1).

Dimensions in millimetres

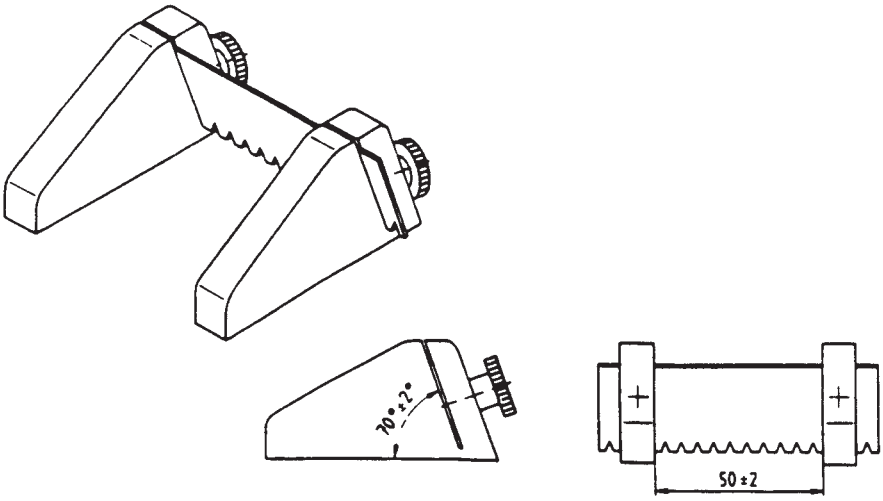


Figure 1: Adhesive applicator

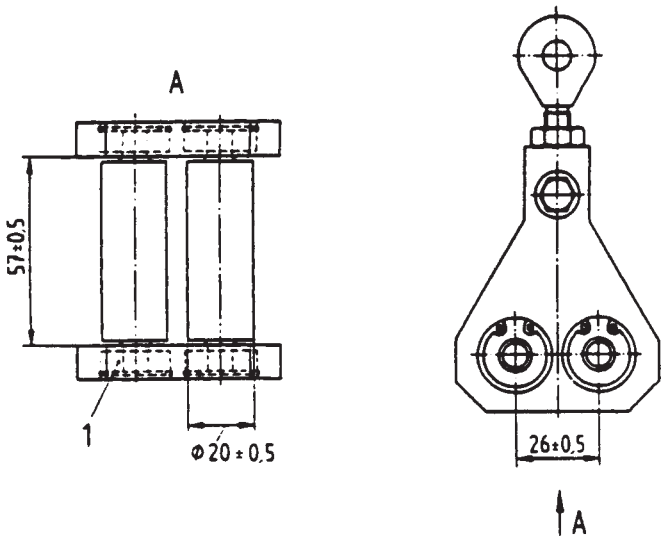
6.2 **Roller**, of width (60 ± 1) mm, diameter (92 ± 1) mm and total mass (3,5 ± 0,01) kg with handle at 90 º to the axis.

6.3 **Heating oven**, with air circulation conforming to 5.2 of EN 29142:1993.

6.4 **Tensile testing machine**, conforming to EN 10002-2, class 1.

6.5 **Peeling device**, with rolls as shown in figure 2.

Dimensions in millimetres



1 bearing

Figure 2: Peeling device

6.6 **Test covering.** Five test pieces for each conditioning sequence of dimensions 250 mm x 50 mm, the 250 mm long side running in the machine direction (where this can be identified) and shall be taken at least 10 mm from the edge.

6.7 Uncoated fibre cement panels, fully compressed and autoclaved, asbestos free. Five fibre cement panels for each conditioning sequence of dimensions 150 mm x 50 mm x 7,5 mm.

7 Preparation of the test specimens

7.1 Cleaning

Ensure that all test coverings and fibre cement panels are clean and free from dust, loose particles or other contamination.

7.2 Sampling and examination of adhesive

Take a sample of the adhesive to be tested in accordance with EN 1066, examine and prepare it for testing in accordance with EN 1067.

7.3 Conditioning of adhesive, coverings and uncoated fibre cement panels

Condition all the components used in a standard atmosphere 23/50 in accordance with ISO 554 for at least 24 h before making the test specimens.

7.4 Application of adhesive

Place masking tape across one end of the less shiny side of each fibre cement panel so as to leave 120 mm length to be coated with adhesive.

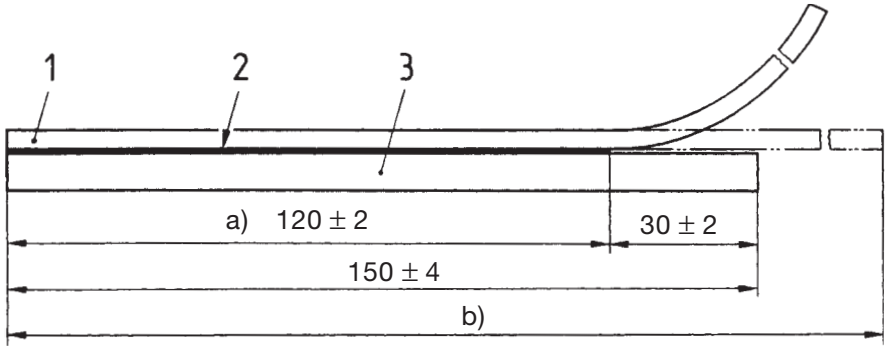
Then apply the adhesive under test across the full width of the fibre cement panel and draw the applicator (see 6.1) steadily down the length of the panel to provide a uniform adhesive application.

Remove the masking tape when the adhesive has been applied. When applying the adhesive, it is essential that the serrated blade is kept clean and free of adhesive build-up. Clean the blade regularly (no more than five fibre cement panels to be prepared without cleaning). In addition, regularly check the notch size and depth, especially where non-hardened steel blades are in use.

7.5 Bonding of the test covering

After a minimum open time, in accordance with EN 923, as indicated by the adhesive manufacturer, and recorded in test report, place the test covering (see 6.6) onto the uncoated fibre cement panel such that one end of the test covering is coincident with the end of the panel coated with the adhesive. Then align the test covering with the panel to produce a bonded area of 120 mm x 50 mm (see figure 3).

Dimensions in millimetres



a) length of the bonding
b) length of the test panel

1 covering
2 adhesive
3 fibre cement panel

Figure 3: Peel test specimen

Immediately after positioning the test covering, roll the test specimen with a roller (see 6.2) by passing forward and backward once along the test specimen without any additional pressure being applied.

Remove any excess adhesive carefully form the edges of the test specimen with a clean tissue. Do not stack more than five test specimens.

NOTE: For coverings which show a tendency to curl after rolling, a dead load of (2 ± 0,1) kg mass can be applied (3 ± 0,5) h onto a stack of five test specimens. The load is spread evenly over the whole surface thus ensuring a contact over the total bonded area of each test specimen. The procedure applied should be recorded in the test report [see 11 h)].

8 Conditioning of the test specimens

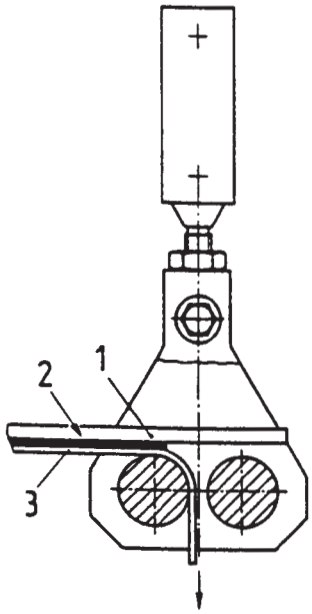
After assembly, expose the test specimens to the conditions as given in table 1.

Table 1: Conditioning

Control test	Test I	Test II[1)]
28 days at a standard atmosphere of 23/50 (see ISO 554)	7 days at a standard atmosphere of 23/50 (see ISO 554)	
	20 days at (50 ± 2) ºC (see ISO 3205)	41 days at (50 ± 2) ºC (see ISO 3205)
	1 day at a standard atmosphere of 23/50 (see ISO 554)	
[1)]This test to be optional for determining the effect of any type of interaction between an adhesive and a covering.		

9 Test procedure

Fix the peeling device (6.5) into the upper grip of the tensile testing machine (6.4) and place the test specimen such that the free end of the covering is between the rolls. Clamp the free end in the lower grip of the test machine (figure 4).



1 fibre cement panel
2 adhesive
3 covering

Figure 4: Clamping of peel test specimens

Set the tensile testing machine to operate with a crosshead movement of (100 ± 10) mm/min.

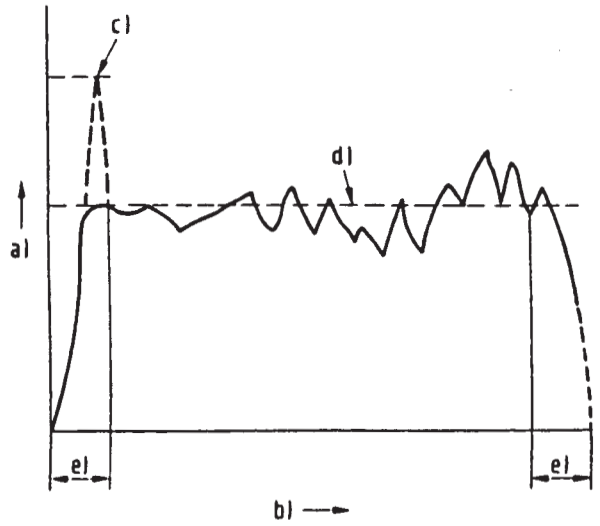
10 Evaluation and expression of results

Peel resistance in Newton per millimetre (N/mm) is the mean value of peel force in newtons (N) obtained from the trace over the course of separation per unit width in millimetres (mm) of the test specimen:

$$\text{Peel resistance} = \frac{\text{Mean peel force during separation, in N}}{\text{Width of test piece, in mm}}$$

Obtain the mean value of peel force (see figure 5) ignoring the first and last 10 mm of the bond, i.e. taking into account only the middle 100 mm of the bond.

NOTE: The mean value of peel force can be determined by means of an integrator or by means of a graphical method, e. g. lay a transparent plate with the length axis drawn on it, onto the curve in such a way that the straight line is at right angles to the axis of the peel force and move it along sideways until the areas above and below are equal.



a) peel force, in newtons
b) peel length of bond, in millimetres
c) initial peak value of peel force
d) mean peel force value after initial peak (if any)
e) first and last 10 mm are ignored.

Figure 5: Determination of mean peel force

Record the peel resistance for each test specimen and calculate the mean value for all five test specimens. Any result which differs by more than 15 % from this value shall be discarded and a second mean value calculated from the remaining results. If more than two results are outside the range, discard the highest and the lowest value and calculate the mean of the remaining three results.

11 Test report

The test report shall include:

a) a reference to this European Standard;

b) the designations of the adhesive, the covering, fibre cement panel, together with their batch number;

c) the notch size of the adhesive applicator;

d) the open time allowed;

e) the conditioning sequences used;

f) the mean value for peel resistance in N/mm for each conditioning sequence and the type of failure, e. g. failure in adhesion, in cohesion of adhesive or in adherent. Report the method of evaluations in accordance with clause 10;

g) any physical changes or abnormalities observed in the bonded test specimen after accelerated ageing conditions;

h) any factors that have affected the result;

i) the date of test.