BRITISH STANDARD

BS EN 13415:2010

Test of adhesives for floor covering — Determination of the electrical resistance of adhesive films and composites

ICS 83.180

National foreword

This British Standard is the UK implementation of EN 13415:2010. It supersedes BS EN 13415:2002 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee PRI/52, Adhesives.

A list of organizations represented on this committee can be obtained on request to its secretary.

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English Version

Test of adhesives for floor covering - Determination of the electrical resistance of adhesive films and composites

Essai des adhésifs pour revêtements de sol - Détermination de la résistance électrique des composites et films d'adhésif

Prüfung von Klebstoffen für Bodenbeläge - Bestimmung des elektrischen Widerstandes von Klebstoff-Filmen und Verbunden

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Foreword

This document (EN 13415:2010) 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of an identical text or by endorsement, at the latest by July 2010, and conflicting national standards shall be withdrawn at the latest by July 2010.

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1 Scope

This European Standard specifies a test method to measure the electrical resistance as a material physical parameter of an adhesive film and composites of floor covering material and adhesive film. The electrical resistance is reciprocal to the electrical conductivity. This laboratory method does not take account of all influences which may occur in practice.

In contrast to EN 1081, which applies to the determination of the electrical resistance of resilient floor coverings R_1, R_2 and R_3 (see Clause 3), this method applies to the determination of the electrical resistance of adhesive films on glass and of composites of floor coverings, adhesively bonded to a fibre cement substrate R_4 and R_5 (see Clause 3).

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 923:2005+A1:2008, *Adhesives — Terms and definitions*

EN 1067, *Adhesives — Examination and preparation of samples for testing*

EN 1081:1998, *Resilient floor coverings — Determination of the electrical resistance*

EN ISO 9142, *Adhesives — Guide to the selection of standard laboratory ageing conditions for testing bonded joints (ISO 9142:2003)*

EN ISO 15605, *Adhesives — Sampling (ISO 15605:2000)*

ISO 554, *Standard atmospheres for conditioning and/or testing — Specifications*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 923:2005+A1:2008 and the following apply.

3.1
vertical resistance of floor covering
R_1
electrical resistance, measured at an unbounded floor covering sample between the tripod electrode on the surface of the floor covering and a second electrode on the opposite underside

3.2
resistance to ground
R_2
electrical resistance, measured at a bonded floor covering between a tripod electrodes on the surface of the floor covering and ground

3.3
point to point resistance
R_3
electrical resistance measured on the surface of a bonded floor covering between two tripod electrodes in a distance of 100 mm

3.4
adhesive resistance
R_4
electrical resistance of a cured adhesive film, measured between two copper strips in a distance of 500 mm to each other

3.5
vertical resistance of composite
R_5
electrical resistance of a bonded floor covering, measured between a tripod electrode on the surface of the floor covering and a copper strip on the underside in a distance of 500 mm to each other

4 Apparatus and materials

4.1 Glass plate, dimensions: approximately 600 mm × 120 mm × 4 mm.

4.2 Uncoated fibre cement panels, fully compressed and autoclaved, asbestos free, with dimensions of approximately 750 mm × 300 mm × 6 mm.

4.3 Adhesive applicator with an opening of (1,0 ± 0,1) mm height and a width of (100 ± 1) mm (see Figure 1).

Dimensions in millimetres

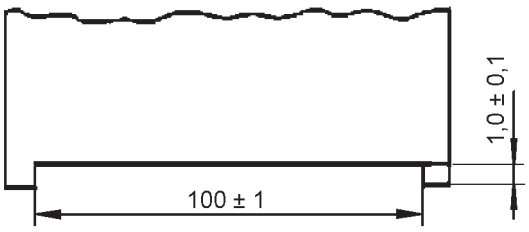


Figure 1 — Opening dimensions of the adhesive applicator

4.4 Adhesive trowel, serrated blade with a notch size specified by the adhesive manufacturer.

4.5 Three copper strips, preferably self-adhesive, dimensions: approximately 120 mm x 10 mm x 0,08 mm.

4.6 Conductive floor covering, dimensions: approx. 700 mm x 250 mm.

4.7 Roller, of width (60 ± 1) mm, diameter (95 ± 1) mm and total mass (3,5 ± 0,1) kg with handle at 90° to the axis (see Figure 2).

Dimensions in millimetres

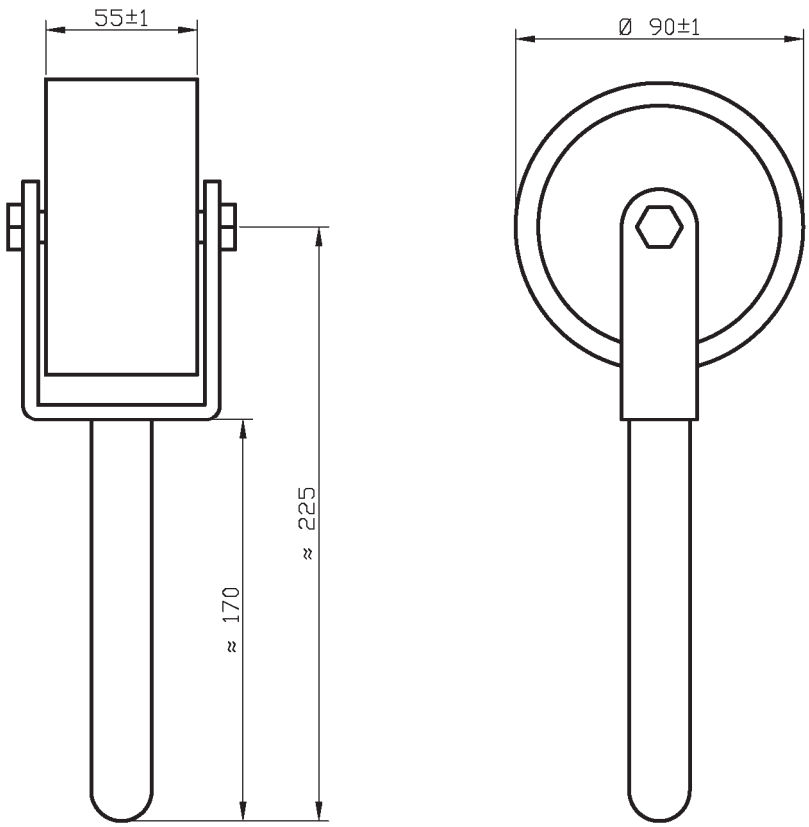


Figure 2 — Roller

4.8 Tripod electrode in accordance with EN 1081:1998 (see EN 1081:1998, 5.1 and Figure 1).

4.9 Load able to apply at least 300 N to the tripod electrode.

4.10 Resistance meter, calibrated, with an accuracy of ± 5 % for *R* values in the range of 10^3 Ω to 10^{10} Ω, and of ± 10 % for more than 10^{10} Ω.

For resistances less than or equal to 10^6 Ω the open circuit voltage shall be 10 V d.c., for resistances greater than 10^6 Ω but not exceeding 10^{10} Ω it shall be 100 V and for resistances greater than 10^{10} Ω it shall be 500 V.

NOTE Recommended is a resistance meter with an inside resistance of 100 kΩ and an inside circuit according to IEC 60093:1980, A.2.2.

4.11 Dry heat chamber, ventilated and adjustable to a temperature between 20 °C and 200 °C according to EN ISO 9142.

5 Preparation of test specimens

5.1 Preparation of test specimens for determination of adhesive resistance R_4

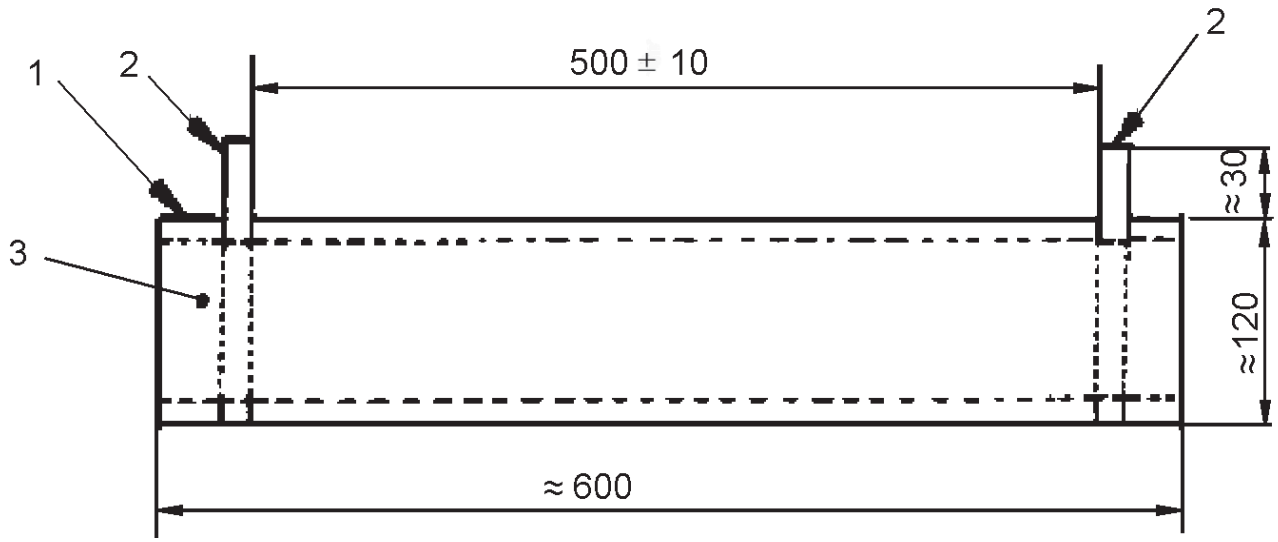
The side of the glass plate (4.1) intended for applying the adhesive shall be free of grease, dust and other contamination.

Take a sample of the adhesive to be tested in accordance with EN ISO 15605, examine and prepare it for testing in accordance with EN 1067.

Two copper strips (4.5) shall be affixed (500 ± 10) mm away from each other in parallel to the shorter edges on the glass plate, making sure they protrude about 30 mm beyond the edge of the plate.

Apply adhesive to produce a uniform thickness of 1 mm. A sufficient quantity of adhesive shall be applied to the prepared surface on one shorter edge of the plate. The adhesive shall be spread evenly using the applicator in accordance with 4.3, in parallel to the longer edge glass plate (see Figure 3).

Dimensions in millimetres



Key
1 Glass plate
2 Copper strip
3 Adhesive film area

Figure 3 — Arrangements of the copper strips

5.2 Preparation of test specimens for determination of vertical resistance of composite R_5

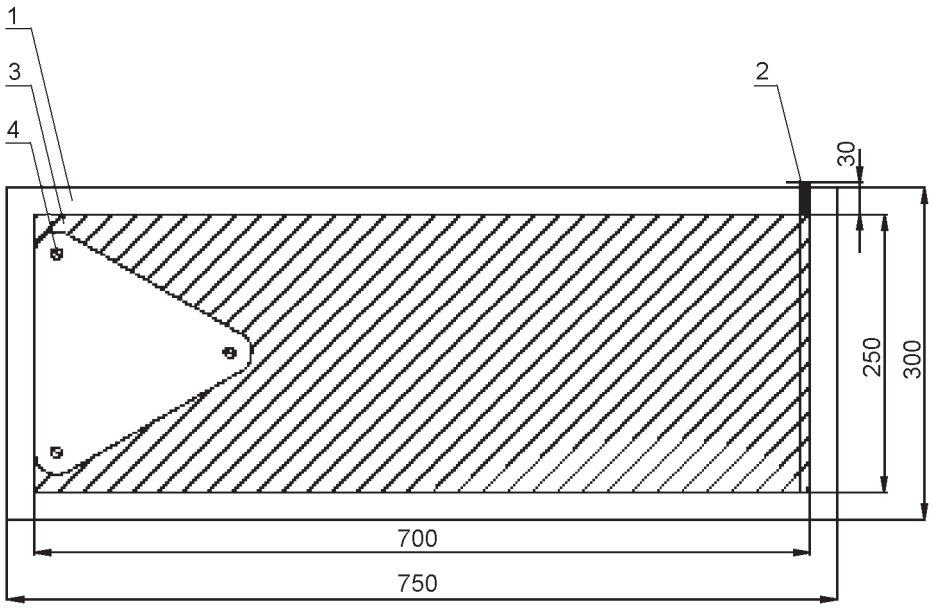
The fibre cement panel (4.2) shall be likewise free of dust and other contamination, and before the adhesive is applied be conditioned for 120 h at (50 ± 3) °C in a dry-heat chamber (see 4.11) and reconditioned for at least 8 h at standard atmosphere 23/50 according to ISO 554.

Take a sample of the adhesive to be tested in accordance with EN ISO 15605, examine and prepare it for testing in accordance with EN 1067.

A copper strip (4.5) shall be affixed parallel to the shorter edge of the fibre cement panel at the end of the panel making sure it protrudes about 30 mm beyond the edge of the panel. A sufficient quantity of adhesive shall be applied to the prepared surface on one shorter edge of the plate. The adhesive shall be spread evenly using the applicator in accordance with 4.4, in a width of 200 mm in the middle and parallel to the longer edge of cement panel.

After the open time specified by the adhesive's producer, the conductive floor coverings (see 4.6) being tested shall be laid into the adhesive bed flush against one short side, just in the middle of the two long sides of the carrier slab, and rolled on using the roller (4.7) by rolling it evenly back and forth three times without additional pressure (see Figure 4).

Dimensions in millimetres



Key
1 Support (fibre cement panel)
2 Copper strip
3 Adhesive film covered with floor covering
4 Tripod electrode

Figure 4 — Fibre cement panel with bonded floor covering

6 Storing the specimens

6.1 Storing the specimens for determination of adhesive resistance R_4

The samples are stored as follows:

a) ~ 24 h at standard atmosphere 23/50 according to ISO 554; plus

b) 24 h at (40 ± 3) °C in a dry-heat chamber (see 4.11); plus

c) 48 h at standard atmosphere 23/50 according to ISO 554.

6.2 Storing the specimens for determination of vertical resistance of composite R_5

The samples are stored as follows:

a) ~ 24 h at standard atmosphere 23/50 according to ISO 554; plus

b) 96 h at (40 ± 3) °C in a dry-heat chamber (see 4.11); plus

c) 48 h at standard atmosphere 23/50 according to ISO 554.

7 Test procedure

7.1 General

The electrical resistances shall be measured following the storage period (6.1 and 6.2).

7.2 Adhesive resistances, R_4

The two copper strips are connected to the resistance meter (4.10).

Testing begins with 100 V test voltage, (15 ± 2) s after applying the test voltage the electrical resistance in ohms (Ω) shall be read. If the value exceeds 10^{10} Ω, the measuring shall be repeated with 500 V test voltage.

7.3 Vertical resistance of composite, R_5

The tripod electrode (see 4.8) is placed on the narrow side of the floor covering (see Figure 4) and loaded with at least 300 N. The electrode and the copper strip on the opposite underside are connected with the resistance meter. Testing begins with 10 V test voltage, (15 ± 2) s after applying the test voltage the electrical resistance in ohms (Ω) shall be read. If the value exceeds 10^6 Ω the measuring shall be repeated with 100 V test voltage. If the value exceeds 10^{10} Ω the final measuring shall be carried out with 500 V test voltage.

8 Test report

The test report shall include, at least, the following information:

a) reference to this European Standard, i.e. EN 13415;

b) designation and the adhesive batch number;

c) designation of the floor covering;

d) the conditioning sequences used;

e) glass plate or fibre cement panel in accordance with 4.1 or 4.2;

f) type of trowel used;

g) open time in minutes (min);

h) measuring electrodes used in accordance with 4.8;

i) electrical resistance of the adhesive film R_4 in ohms (Ω);

j) electrical resistance of composite R_5 in ohms (Ω);

k) deviations from this standard;

l) date of test.

Bibliography

[1] IEC 60093:1980, *Methods of test for volume resistivity and surface resistivity of solid electrical insulating materials*

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