INTERNATIONAL STANDARD

ISO 9986

Second edition
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Composition cork for shoe outsoles

Aggloméré composé de liège pour semelles extérieures pour chaussures

Reference number
ISO 9986:2014(E)

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 87, *Cork*.

This second edition cancels and replaces the first edition (ISO 9986:1990), which has been technically revised.

Composition cork for shoe outsoles

1 Scope

This International Standard specifies requirements for test methods as regards composition cork for the manufacture of outsoles of shoes and boots.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 4714, *Composition cork — Specifications, sampling, packaging and marking*

ISO 7322, *Composition cork — Test methods*

3 Requirements

3.1 Dimensions and tolerances

Unless otherwise agreed, the nominal dimensions of composition cork for the manufacture of outsoles are as follows:

blocks: 1 025 mm × 525 mm × 200 mm

slabs: 1 025 mm × 525 mm × 30 mm

1 025 mm × 525 mm × 60 mm

1 025 mm × 525 mm × 100 mm

The tolerances on these dimensions are specified in ISO 4714.

3.2 Density

Blocks or slabs tested in accordance with 5.3.2 shall have a density not less than 250 kg/m^3.

3.3 Moisture content

The moisture content of composition cork tested in accordance with 5.3.3 shall not be higher than 8 %.

3.4 Resistance to boiling water

Composition cork tested in accordance with 5.3.4 shall not show signs of disintegration.

3.5 Water retention and loss

Composition cork tested in accordance with 5.3.5 shall not exhibit water retention greater than 30 % and shall show a water loss greater than 40 %.

3.6 Resistance to bending

Blocks or slabs tested in accordance with 5.3.6 shall not exhibit cracks when under a flexion of 10 daN/cm^2 before being immersed in water and of 5 daN/cm^2 after immersion in water.

3.7 Resistance to mould

Composition cork tested in accordance with 5.3.7 shall not exhibit the development of mould.

3.8 Tensile strength

The tensile strength of the composition cork determined in accordance with 5.3.8 shall be at least of 200 kPa (see ISO 4714).

4 Sampling

From each homogeneous lot of up to 500 units, take at random 1 % of the blocks or slabs. From each homogeneous lot of more than 500 units, take 0,2 % of the blocks or slabs up to a maximum of 10 blocks or slabs.

The number of the blocks or slabs to be taken shall be rounded off to the nearest higher unit.

Table 1 — Dimensions and number of test pieces

Test	Dimensions of test pieces (mm)	Number of test pieces	Remarks
Dimensions	Block or slab itself	According to sampling	—
Density	Unit obtained from lamination of the block or slab	3	—
Moisture content	50 × 50 × 25	3	—
Resistance to boiling water	50 × 50 × 25	3	—
Water retention and loss	175 × 75 × 25	(3*)	Test pieces are later submitted to the test for resistance to bending
Resistance to bending	175 × 75 × 25	3 + (3*)	(3*) from the previous test
Resistance to mould	50 × 50 × 25	5	
Tensile strength	100 × 50 × 25	3	

5 Test methods

5.1 Apparatus

See Annex A and ISO 7322.

5.1.1 Vernier gauge, with a resolution of 0,1 mm.

5.1.2 Container, to carry out the test of retention and loss of water.

5.1.3 Electrical disc saw.

5.2 Test pieces

5.2.1 Preparation

Laminate the blocks or slabs to obtain test samples with thickness of 25 mm.

Using a saw, cut each sample at the extremities and in the middle to obtain the dimensions and number of test pieces as indicated in Table 1.

5.2.2 Conditioning

The tests shall be carried out at room temperature, using test pieces previously conditioned for 24 h in a conditioning chamber at a temperature of 23 °C ± 2 °C and a relative humidity of 50 % ± 5 %.

5.3 Determinations

5.3.1 Dimensions

Each of the dimensions of the blocks or slabs, determined by means of a metal ruler, shall be the arithmetic average of three measurements taken on the edges and in the middle of the corresponding face.

Express the results, in millimetres, rounded off to the nearest unit.

5.3.2 Density

Determine the density of the test pieces in accordance with ISO 7322.

5.3.3 Moisture content

Determine the moisture content of the test pieces by drying them in the oven at 103 °C ± 2 °C to constant mass.

5.3.4 Resistance to boiling water

Determine the resistance of the test pieces to boiling water in accordance with ISO 7322.

5.3.5 Water retention and loss

5.3.5.1 Procedure

Determine the mass of a test piece (m_0).

Immerse the test piece for three days in a container containing distilled water.

Remove excess water with filter paper and weigh again (m_1).

Leave the test piece for 16 h at the ambient temperature and weigh once again (m_2).

Repeat these operations for all the test pieces.

5.3.5.2 Expression of results

Calculate the water retention, R, and loss, P, related to the initial mass of each test piece, expressed as a percentage and rounded off to the nearest 0,1, using Formula (1) and Formula (2):

$$R = \frac{m_1 - m_0}{m_0} \times 100 \qquad (1)$$

$$P = \frac{m_1 - m_2}{m_1 - m_0} \times 100 \quad (2)$$

where

m_0 is the initial mass of the test piece, expressed in grams, rounded off to the nearest 0,1 g;

m_1 is the mass of the test piece after immersion, expressed in grams, rounded off to the nearest 0,1 g;

m_2 is the final mass of the test piece, expressed in grams, rounded off to the nearest 0,1 g.

Calculate the water retention and water loss based on the arithmetic averages of the results obtained for all test pieces.

Express the results as percentage, rounded off to the nearest integer.

5.3.6 Resistance to bending

Determine the resistance of the test pieces to bending in accordance with the method given in Annex A.

The test shall be carried out both on test pieces as prepared, and on test pieces previously tested as in 5.3.5.

5.3.7 Resistance to mould

5.3.7.1 Procedure

Place the test pieces for 7 d in a conditioning chamber with a temperature of 35 °C ± 5 °C, and with a relative humidity higher than 90 %.

Remove the test pieces and observe them with the naked eye.

5.3.7.2 Expression of results

Express the results by reporting the presence or absence of mould.

5.3.8 Tensile strength

Determine the tensile strength of the test pieces tested in accordance with ISO 7322.

5.4 Test report

The test report shall include the following information:

a) a reference to this International Standard (i.e. ISO 9986:2014);

b) all details required to identify the sample;

c) the results obtained;

d) all details of procedure not specified in this International Standard or any optional operations;

e) any occurrences that may have affected the results.

Annex A
(normative)

Determination of the modulus of rupture by bending

A.1 Apparatus

A.1.1 Bending machine, accurate to 1 N, provided with a fixed head and a mobile head, the late moving vertically at a speed of 30 cm/min.

The fixed head has two cylindrical steel supports with a diameter of (20 ± 2) mm on which the test piece is freely placed, the distance between them being adjustable. The mobile head has a fitting similar to each of the supports and parallel to and equidistant from them.

A.1.2 Metal rule, graduated in 0,5 mm.

A.2 Procedure

Make the tests at room temperature and humidity.

After having measured the linear dimensions with the ruler, place each test piece on the fixed support of the bending machine, the axis-to-axis distance of which shall be equal to five times the nominal thickness of the board.

Apply the mobile head on the test piece and record the value of the force which produces rupture.

A.3 Expression of results

The modulus of rupture by bending for the test piece, in megaPascal, to the nearest 0,01 MPa, is given by Formula (A.1):

$$\frac{3\times F\times l}{2\times b\times \delta^2}\times 10 \qquad \text{(A.1)}$$

where

F is the breaking force in Newton to the nearest unit;

l is the distance between the supports in millimetre, to the nearest unit;

b is the breadth of the test piece in millimetre, to the nearest unit;

δ is the thickness of the test piece, in millimetre to the nearest unit.

Take the average of the three tests as the results.