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Composition cork — Test methods

Aggloméré composé de liège — Méthodes d'essai

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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 third edition cancels and replaces the second edition (ISO 7322:2000). Minor editorial details have been introduced in this edition.

Composition cork — Test methods

1 Scope

This International Standard specifies test methods for the determination of the following characteristics of composition cork:

— thickness,

— apparent density,

— tensile strength,

— compressibility and recovery,

— resistance to boiling water.

This International Standard is applicable to the product in sheet or roll form.

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 2859-1, *Sampling procedures for inspection by attributes — Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
composition cork
product obtained from the agglutination of cork granules with the addition of a binder generally not derived from cork cells

3.2
rubbercork
product manufactured as a compound of cork granules and rubber, which can be used either in the form of granules or as a binder

4 Apparatus

4.1 Static load press, with flat parallel plates of dimensions greater than those of the test specimens to be tested, one fixed and the other mobile to enable the load application at a constant rate, and equipped with the following items.

4.1.1 Cylindrical indentors, made of stainless steel having the following diameters:

— 28,7 mm, for testing composition cork,

— 12,8 mm, for testing rubbercork.

4.1.2 Dial gauge, attached to the movable plate, capable of being read to the nearest 0,02 mm.

4.1.3 Weights, for adjusting the applied load, having masses accurate to ± 1 %.

4.2 Tensile testing machine, with one fixed jaw and one mobile jaw 12 mm apart (to test composition cork) or 50,8 mm apart (to test rubbercork), with readings are accurate to ± 1 N.

The mobile jaw shall move unloaded at a speed of 300 mm/min.

4.3 Balance, with a resolution of 0,01 g.

4.4 Oven or climatic room, with temperature and humidity controls.

4.5 Vernier gauge, with a constant contact force, and a resolution of 0,1 mm.

4.6 Metal ruler, with a resolution of 1 mm.

4.7 Chronometer with a resolution of 1 s.

4.8 Cutting system, to cut the test specimens.

4.9 Open container, for water.

5 Sampling and preparation of test specimens

5.1 Sampling

From each lot, the number of packages, at least three, and the quantity of material to be taken from the sample shall follow ISO 2859-1 for the inspection level agreed between parties.

5.2 Preparation of test specimen

From each sheet of the material, cut the test specimens as indicated in Table 1, at least 100 mm away from the edges. Each test specimen shall be squarely cut with the edges perpendicular to its surface, showing no cracks or folds.

5.3 Conditioning

Test specimens shall be conditioned for 48 h at 23 °C. In case of dispute, the test specimens shall be conditioned at a temperature of (23 ± 2) °C and (50 ± 5) % of relative humidity, for 48 h. Unless otherwise specified, the tests shall be carried out at the same temperature and humidity conditions.

Table 1 — Dimensions and number of test specimens

Test	Dimensions of test specimens mm	Number of test specimens	Notes
Thickness	100 × 50	5	
Apparent density	100 × 50	5	The test specimens for the thickness test may be used.
Tensile strength	100 × 50	3	If the composition cork was produced in rolls, take 3 test specimens in the direction of the compression plus 3 test specimens in the perpendicular direction.
Compressibility and recovery	50 × 50 or circular with Ø = 28,7	3 test specimens (in the case of single sampling) or 3 groups of *n* test specimens	
Resistance to boiling water	50 × 50	3	

6 Tests

6.1 Thickness

6.1.1 Procedure

Place one test specimen on the fixed plate of the static press (4.1). Apply the indentor (4.1.1) without shock at the centre of the test specimen and apply the mass defined in Table 2, in accordance with the type of composition cork concerned. After 15 s, read the thickness in the dial gauge (4.1.2).

For test specimens with thicknesses greater than 10 mm, a Vernier gauge (4.5) shall be used.

6.1.2 Calculation and expression of results

The thickness of the sample is the average of the results obtained for each test specimen. Express the results in millimetres, rounded off to the nearest 0,1 mm.

Table 2 — Applied masses for the thickness measurement

Material	Diameter of the indentor mm	Mass g	Force N	Pressure kPa
composition cork	28,7	450	4,4	6,8
rubbercork	12,8	450	4,4	34,3

6.2 Apparent density

6.2.1 Procedure

Use the Vernier gauge (4.5) or a metal ruler (4.6) to determine the length and the width of each test specimen, in millimetres, to the nearest 0,1 mm and record the values obtained. Determine the mass of each test specimen to the nearest 0,1 g and record the values obtained.

6.2.2 Calculation and expression of results

The apparent density of each test specimen, expressed in kilograms per cubic metre, is given by the Formula (1):

$$\frac{m}{l \times b \times d} \times 10^6 \tag{1}$$

where

m is the mass of the test specimen, expressed in gram, rounded to the nearest 0,1 g;

l is the length of the test specimen, expressed in millimetres, rounded to the nearest integer;

b is the width of the test specimen, expressed in millimetres, rounded to the nearest integer;

d is the thickness of the test specimen, obtained from 6.1, expressed in millimetres, rounded to the nearest 0,1 mm.

The apparent density of the sample is the average of the results obtained for each test specimen rounded off to the nearest integer.

6.3 Tensile strength

6.3.1 Procedure

Clamp one test specimen in the machine jaws so that the force is exerted on the length of the test specimen. Set the machine in operation and record the force (F) at which rupture occurs.

Any test specimen for which rupture occurs at the jaw level shall be eliminated and replaced by a new test specimen.

6.3.2 Calculation and expression of results

The tensile strength of each test specimen, expressed in kilopascals, is given by Formula (2):

$$\frac{F}{b \times d} \times 10^3 \tag{2}$$

where

F is the force at which rupture occurs, expressed in newtons, rounded to the nearest integer;

b is the width of the test specimen, expressed in millimetres, rounded to the nearest integer;

d is the thickness of the test specimen, expressed in millimetres, rounded to the nearest 0,1 mm.

The tensile strength of the sample is the average of the results obtained for each test specimen rounded to the nearest integer.

6.4 Compressibility and recovery

6.4.1 Procedure

The dimensions of test specimens are specified in Table 1.

Test specimens shall consist in a single ply or a number of superimposed plies to give a minimum test thickness of 3,2 mm.

Determine the deflection of the indentor for each load specified in Table 3 without any test specimen. Subtract any measurable value occurring on the static press from the thickness under total load. This value shall be subtracted from the readings with the test specimen.

NOTE The deflection in the testing apparatus can also be compensated by setting the dial gauge on the negative side of zero at a reading equal to the deflection.

Table 3 — Applied loads and corresponding pressures

Type of material	Diameter of the indentor mm	Preload N	Major load N	Total load N	Total pressure kPa
composition cork	28,7	4,5	440	445	700
composition cork with cellular rubber	28,7	4,5	440	445	700
rubbercork	12,8	4,5	351	355	2750

Centre the test specimen on the base of the press (4.1) and apply the preload; maintain this load for 15 s. Record the reading (d_1) in the dial gauge under the action of the preload.

Immediately and without shock, apply the major load so that the total load is reached in 10 s; maintain the total load for 60 s and record the thickness of the test specimen (d_2) in the dial gauge. Immediately remove the major load. After 60 s read the new thickness (d_3) under the preload.

6.4.2 Calculation and expression of results

The compressibility of each test specimen, expressed in percentage, is given by Formula (3):

$$\frac{d_1 - d_2}{d_1} \times 100 \tag{3}$$

The recovery of each test specimen, expressed in percentage, is given by Formula (4):

$$\frac{d_3 - d_2}{d_1 - d_2} \times 100 \tag{4}$$

where

d_1 is the reading in the dial gauge, for each test specimen under the preload, expressed in millimetres, rounded to the nearest 0,1 mm;

d_2 is the reading in the dial gauge, for each test specimen under total load, expressed in millimetres, rounded to the nearest 0,1 mm;

d_3 is the reading in the dial gauge, for each test specimen after the recovery and under the preload, expressed in millimetres, rounded to the nearest 0,1 mm.

The test result is the average of the results obtained for each test specimen, expressed in percentage rounded to the nearest integer.

6.5 Resistance to boiling water

6.5.1 Procedure

Boil the water in a container (4.9). Place the test specimens and keep the water boiling for 3 h. Remove the test specimens and make their visual examination.

6.5.2 Expression of result

Express the test results by stating the existence or absence of disaggregation[1)] of the sample.

7 Test report

The test report shall include the following information:

a) reference to this International Standard, i.e. ISO 7322;

b) the complete identification of the product tested, including the type, source and the manufacturer's references;

c) sampling report;

d) results obtained;

e) any deviation from this International Standard that may have affected the results.

1) A test specimen is said to disaggregate if it splits open and/or if it shows substantial loss of particles during the test.

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