INTERNATIONAL STANDARD

ISO 7322

Second edition
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Composition cork — Test methods

Aggloméré composé de liège — Méthodes d'essai

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 7322 was prepared by Technical Committee ISO/TC 87, *Cork*.

This second edition cancels and replaces the first edition (ISO 7322:1986). Technical changes have been introduced in the sampling and preparation of test specimens. The test method to evaluate the behaviour in boiling hydrochloric acid has been removed.

Introduction

Composition cork is a material obtained by bonding cork granules with an adhesive. It may have different compositions and applications.

The aim of this International Standard is to indicate general test methods in order to enable its minimum characterization.

Specific test methods directly concerning composition cork performance in a specific application are stated in separate standards, in accordance with the intended use, e.g. ISO 3867 and ISO 4708.

Composition cork of low thickness may be produced as such by direct compression or may be obtained either by reslicing blocks or by unwinding and cutting cylindrical rolls.

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 the form of sheets or rolls.

2 Normative reference

The following normative document contains provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, of this publication do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent edition of the normative document indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

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 International Standard, the following terms and definitions apply.

3.1
composition cork
agglomerated composition cork
product obtained from the agglutination of cork granules with the addition of a binder which is 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 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 accurate to ± 1 N.

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

4.3 Balance, capable of being read to ± 0,01 g.

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

4.5 Vernier gauge, with a constant contact force, and capable of being read to ± 0,1 mm.

4.6 Metal ruler, capable of being read the nearest 1 mm.

4.7 Chronometer, capable of being read to the nearest 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 be in accordance with 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 a relative humidity of (50 ± 5) % for 48 h. Unless otherwise specified, the tests shall be carried out under 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 diameter of 28,7 mm)	3 (single ply) 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 on 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 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:

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

where

m is the mass of the test specimen, expressed in grams, 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 the formula:

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

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 shall be as 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 may also be compensated for 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
Agglomerated composition cork	28,7	4,5	400	445	700
Composition cork with cellular rubber	28,7	4,5	400	445	700
Rubbercork	12,8	4,5	351	355	2 750

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) on 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) from the dial gauge. Immediately remove the major load. After 60 s, read from the dial gauge the new thickness (d_3) under the preload.

6.4.2 Calculation and expression of results

The compressibility of each test specimen, expressed in percent, is given by the formula:

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

The recovery of each test specimen, expressed in percent, is given by the formula:

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

where

d_1 is the reading on 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 on the dial gauge, for each test specimen after 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 percent rounded to the nearest integer.