
INTERNATIONAL STANDARD



3810

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Cork — Floor tiles of agglomerated cork — Methods of test

Liège — Dalles d'aggloméré pour revêtements de sol — Méthodes d'essai

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FOREWORD

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO member bodies). The work of developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been set up 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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 3810 was drawn up by Technical Committee ISO/TC 87, *Cork*, and was circulated to the member bodies in April 1975.

It has been approved by the member bodies of the following countries:

Australia	Italy	Spain
Czechoslovakia	Pakistan	Turkey
France	Portugal	United Kingdom
Germany	Romania	Yugoslavia
Hungary	South Africa, Rep. of	

No member body expressed disapproval of the document.

Cork — Floor tiles of agglomerated cork — Methods of test

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies methods of test for determining the following characteristics of agglomerated cork floor tiles : dimensions, apparent density, tensile strength, initial and residual indentation, ash content and behaviour in fuming hydrochloric acid at 100 °C (see ISO ...).

2 REFERENCES

ISO/R 633, *Cork — Glossary*.

ISO 3813, *Cork — Floor tiles — Characteristics*.¹⁾

3 APPARATUS

3.1 **Balance**, 2 kg capacity, accurate to $\pm 0,5$ g.

3.2 **Balance**, accurate to $\pm 0,1$ mg.

3.3 **Crucible**, made of porcelain, nickel or platinum.

3.4 **Stop-watch**.

3.5 **Conditioning cabinet**, adjustable for temperature and humidity.

3.6 **Electrically heated oven**, capable of maintaining temperature at 103 ± 2 °C.

3.7 **Desiccator**.

3.8 **Tensile testing machine**, accurate to ± 1 N, with one fixed jaw and one movable jaw, initially 12 mm apart, the movable jaw moving, when unloaded, at a speed of 300 mm/min.

3.9 **Electric muffle furnace**, capable of maintaining temperature at 450 ± 20 °C.

3.10 **Static load press** with a non-deformable plane base-plate of dimensions greater than those of the test specimen, equipped with :

3.10.1 **Cylindrical indenter** made of steel, 11,28 mm in diameter (cross-sectional area 1 cm²), fitted on the movable head.

3.10.2 **Dial micrometer** accurate to $\pm 0,05$ mm, attached to the movable head and giving by direct reading the thickness of the compressed material.

3.10.3 **Weights** to be used for applying the load to the movable head.

3.11 **Open container** for water.

3.12 **Open container** for fuming hydrochloric acid, equipped with a reflux condenser and heating device, fitted with a thermometer, to maintain temperature at 100 °C.

3.13 **Metal rule** graduated in 0,5 mm.

3.14 **Electrical disc saw**.

3.15 **Thermometer** graduated in degrees Celsius.

4 REAGENT

4.1 **Hydrochloric acid**, ρ_{20} 1,19 g/ml.

5 METHODS OF TEST

Tests shall be carried out at room temperature, on test specimens taken from a sample obtained in accordance with ISO 3813 and conditioned in the cabinet (3.5) for 24 h at 20 ± 2 °C and at a relative humidity of 65 ± 5 %, unless otherwise specified.

5.1 Dimensions

5.1.1 Length and width

Use the metal rule (3.13) to measure the length and the width of each tile in the sample. For the length as well as the width, take the average of three measurements made along the edges and across the centre. Express the results in millimetres, rounded off to the nearest 0,1 mm.

1) At present at the stage of draft.

5.1.2 Thickness

Use the press (3.10) to determine the thickness of each tile in the sample. Use a pencil to draw lines dividing the surface of each tile into four equal rectangles. Place the tile on the base-plate of the press, apply the indenter to the centre of one of the rectangles for 15 s under a load of 1,5 daN/cm², and then read the thickness of the tile. Slide the tile across the plate and determine the thickness at the centre of each of the remaining rectangles, following the same procedure. The mean thickness of the tile shall be the average of the four measurements.

Express the results of the measurements obtained from 12 tiles in millimetres, rounded off to the nearest 0,1 mm.

5.1.3 Deviations

For each dimension the deviation shall be the average of the deviations determined for each tile. No single deviation may exceed the permissible tolerance specified in ISO 3813.

In the case of thickness, the single deviation means the deviation of the measurement obtained from each one of the rectangles into which the tile was divided.

5.2 Apparent density

5.2.1 Procedure

Determine the dimensions of each tile in the sample, following the same procedure as in 5.1, and weigh on the balance (3.1). The apparent density is obtained by dividing the mass of the tile, in grams rounded off to the nearest integer, by its volume expressed in cubic centimetres rounded off to the nearest integer, the volume being equal to the product of the linear dimensions expressed in centimetres rounded off to the nearest 0,1 cm.

5.2.2 Expression of results

The apparent density of the sample shall be the average of the values resulting from the tests. Express the result in kilograms per cubic metre, rounded off to the nearest integer.

5.3 Initial and residual indentation

5.3.1 Preparation of test pieces

Use the saw (3.14) to cut one test piece measuring 5 cm x 5 cm, and of the thickness of the tile, from each tile in the sample.

5.3.2 Procedure

Place the test piece on the base-plate of the press (3.10), apply the indenter to the centre under a load of 1,5 daN/cm² for 15 s and immediately read the thickness d_1 of the test piece; then increase the pressure exerted by the indenter to 40 daN/cm², maintain it at that level for 10 min, then read the thickness d_2 of the test piece at the point where the indenter was applied. Remove the load and allow the test piece to recover for 1 h. At the end of

this period, re-apply the indenter under a load of 1,5 daN/cm² for 15 s and read the thickness d_3 of the test piece at the point where the tile has been compressed.

5.3.3 Expression of results

The initial indentation of each test piece, expressed as a percentage, is given by the formula :

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

The residual indentation of each test piece, expressed as a percentage, is given by the formula :

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

The initial and residual indentations shall be the average of the values thus found, rounded off to the nearest 0,1 %.

5.4 Tensile strength

5.4.1 Preparation of test pieces

Take three tiles at random from the sample. Use the saw (3.14) to cut from each a test piece measuring 5 cm x 4 cm and of the thickness of the tile.

5.4.2 Procedure

Determine the width and the thickness of the test pieces, following the same procedure as in 5.1. Clamp each test piece, with the long edges vertical, in the jaws of the machine (3.8); set the machine in operation and record the force at which rupture occurs.

5.4.3 Expression of results

The tensile strength of the test piece, expressed in decanewtons per square centimetre, is given by the formula :

$$\frac{F}{b \times d}$$

where

F is the force at which rupture occurs, expressed in decanewtons, rounded off to the nearest 0,1 daN;

d is the thickness of the test piece, expressed in centimetres, rounded off to the nearest 0,1 cm;

b is the width of the test piece, expressed in centimetres, rounded off to the nearest 0,1 cm.

The tensile strength of each test piece shall be recorded in the test report, rounded off to the nearest 0,1 daN/cm².

5.5 Ash content

5.5.1 Preparation of test piece

From one of the tiles in the sample take one piece weighing approximately 10 g and break it up so that the fragments can be placed in the crucible (3.3).

5.5.2 Procedure

Place the fragments (5.5.1) in the crucible (3.3). Dry the crucible and contents in the oven (3.6) at $103 \pm 2^\circ\text{C}$, allow to cool in the desiccator (3.7), then weigh. Repeat the drying, cooling and weighing operations till constant mass is reached; place in the muffle furnace (3.9) at $450 \pm 20^\circ\text{C}$ to ignite the agglomerated cork; allow the crucible and contents to cool in the desiccator (3.7), then re-weigh. Repeat the procedure till constant mass is reached.

5.5.3 Expression of results

The ash content of the test piece, as a percentage by mass, is given by the formula :

$$\frac{m_2 - m_0}{m_1 - m_0} \times 100$$

where

m_0 is the mass of the crucible, in grams, rounded off to the nearest 0,001 g;

m_1 is the mass of the crucible with the dried test piece, in grams, rounded off to the nearest 0,001 g;

m_2 is the mass of the crucible with the residue, in grams, rounded off to the nearest 0,001 g.

Express the result to the nearest 0,1 %.

5.6 Behaviour in fuming hydrochloric acid at 100°C

5.6.1 Preparation of test pieces

Take three tiles at random from the sample and use the saw (3.14) to cut from each a test piece measuring 5 cm x 4 cm and having the thickness of the tile.

5.6.2 Procedure

Heat the container (3.12) containing hydrochloric acid (4.1) until the acid reaches a temperature of 100°C . Place the test pieces in the container and keep the temperature at 100°C for 1 h, checking with the thermometer (3.15). Take out the test pieces and make a visual examination.

5.6.3 Expression of results

The result of the test is expressed by stating the presence or absence of disintegration¹⁾ in the agglomerated cork.

6 TEST REPORT

The test report shall include the following information :

- a) the results obtained;
- b) method used;
- c) all details of procedure not specified in this International Standard, or optional;
- d) any occurrences that may have affected the results;
- e) all details required to identify the sample completely.

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

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