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**Cylindrical cork stoppers — Physical  
tests —**

Part 3:  
**Determination of humidity content**

*Bouchons cylindriques en liège — Essais physiques —  
Partie 3: Détermination du taux d'humidité*



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## Foreword

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The main task of technical committees is to prepare International Standards. 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 document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 9727-3 was prepared by Technical Committee ISO/TC 87, *Cork*.

This first edition of ISO 9727-3, together with the other parts of ISO 9727:2007, cancels and replaces ISO 9727:1991, which has been technically revised.

ISO 9727 consists of the following parts, under the general title *Cylindrical cork stoppers — Physical tests*:

- *Part 1: Determination of dimensions*
- *Part 2: Determination of mass and apparent density for agglomerated cork stoppers*
- *Part 3: Determination of humidity content*
- *Part 4: Determination of dimensional recovery after compression*
- *Part 5: Determination of extraction force*
- *Part 6: Determination of liquid tightness*
- *Part 7: Determination of dust content*



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# Cylindrical cork stoppers — Physical tests —

## Part 3: Determination of humidity content

### 1 Scope

This part of ISO 9727 specifies a test method for determining the humidity content of cylindrical cork stoppers, ready for use or semi-worked.

### 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.

ISO 633, *Cork — Vocabulary*

### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 633 and the following apply.

#### 3.1

##### **constant mass**

mass of a stopper submitted to a drying operation is called constant when the difference between two consecutive weighings does not differ by more than 10 mg

### 4 Apparatus

#### 4.1 Long method

4.1.1 **Balance**, with a resolution less than or equal to 0,001 g.

4.1.2 **Desiccator**, with a hygroscopic salt and a saturation indicator.

4.1.3 **Ventilated oven**, at  $103\text{ °C} \pm 4\text{ °C}$ .

#### 4.2 Quick method

4.2.1 **Specific device to measure resistivity**, with two electrodes adapted to the cork material and that can be checked through a standard resistance (4.2.2).

4.2.2 **Standard resistance**.

## 5 Test conditions

### 5.1 Environment

The test shall be carried out in an environment with the following characteristics:

- temperature  $21\text{ °C} \pm 4\text{ °C}$ ;
- relative humidity of air  $60\% \pm 20\%$ .

### 5.2 Cork stoppers

At the beginning of the test, and using the quick method (7.2) confirm that the stoppers of the test sample are at a temperature of  $21\text{ °C} \pm 4\text{ °C}$ .

## 6 Sampling

From each lot, take the quantity of stoppers that correspond to the sampling plan previously agreed between the interested parties.

## 7 Procedure

### 7.1 Long method

Identify each stopper. Weigh each stopper with the balance (4.1.1). Register the result.

Place the unbroken stoppers in the oven regulated to  $103\text{ °C} \pm 4\text{ °C}$  (4.1.3) for 24 h. Agglomerated cork stoppers with one or more discs of natural cork glued onto one end shall be separated into their parts, agglomerated body and discs, before going into the oven.

Take the stoppers (or parts of stoppers) out of the oven and place them in the desiccator (4.1.2) for, at a minimum, 30 min.

Weigh each stopper (or part of the stopper whenever it is an agglomerated cork stopper with one or more discs of natural cork glued onto one end). Register the result.

Put the stoppers (or parts of stoppers) back in the oven for 2 h.

Take the stoppers (or parts of stoppers) out of the oven and place them in the desiccator for 30 min.

Weigh each stopper (or part of a stopper).

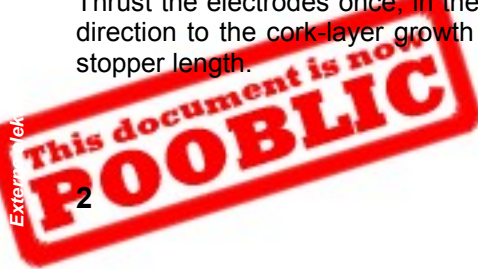
If the difference between the mass obtained and the previous one is superior to 10 mg, repeat the procedure until two consecutive weighing do not differ by more than 10 mg.

### 7.2 Quick method

The test is described for each stopper. Repeat the test with each stopper from the global sample.

Regulate the scale of the device (4.2.1) to "cork", if several options are available.

Thrust the electrodes once, in the middle of the stoppers, 4 mm to 6 mm deep into the cylinder, in the cross-direction to the cork-layer growth of natural cork stoppers, the two electrodes defining a plan parallel to the stopper length.



Do not thrust electrodes into visible defects of the stopper, as the measurement performance may be affected.

When the measurement is carried out inside discs of agglomerated cork stoppers with one or more discs glued onto one end, the method used to thrust the electrodes in shall be included in the test report.

Read either the value, if it is shown on the device, or the measurement, reported from the device standard curve. Register the result.

## 8 Results

### 8.1 Long method

The humidity content,  $H$ , of a stopper, expressed in percentage, is given by the equation:

$$H = \frac{(m_1 - m_2)}{m_1} \times 100$$

where

$m_1$  is the initial mass of the stopper, before drying;

$m_2$  is the mass of the stopper, after drying.

The result per stopper is rounded off to the nearest 0,1 %.

### 8.2 Quick method

Humidity, read on or determined from the curve of the device to measure resistivity, is expressed in percentage, rounded off in accordance with the following principle:

EXAMPLE     6 to 6,4 = 6;

6,5 to 7 = 7.

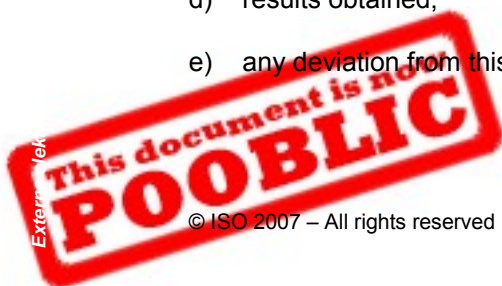
### 8.3 Final result

Whatever the method used, the test result is the arithmetic average of the results obtained with each stopper of the test sample, expressed in percentage, rounded off to 0,1 %, and also the standard deviation and the maximum and minimum results rounded off to 0,1.

## 9 Test report

The test report shall include the following information:

- a) a reference to this part of ISO 9727, specifying which of the two described methods was used;
- b) complete identification of the sample, including its type and origin;
- c) sampling report;
- d) results obtained;
- e) any deviation from this part of ISO 9727 that may have affected the results.



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