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**Footwear — Test methods for outsoles —  
Dimensional stability**

*Chaussures — Méthodes d'essai applicables aux semelles d'usure —  
Stabilité dimensionnelle*

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Printed in Switzerland

## 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.

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 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 20873 was prepared by the European Committee for Standardization (as EN 12772:1999) and was adopted, under a special "fast-track procedure", by Technical Committee ISO/TC 216, *Footwear* in parallel with its approval by the ISO member bodies.

Annex A of this International Standard is given for information only.

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**Foreword**

This European Standard has been prepared by Technical Committee CEN/TC 309 "Footwear", the secretariat of which is held by AENOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by May 2000, and conflicting national standards shall be withdrawn at the latest by May 2000.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

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## 1 Scope

This standard specifies a method for determining the linear shrinkage after heating of test specimens prepared from outsoles.

## 2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 12222 Footwear - Standard atmospheres for conditioning and testing of footwear and components for footwear.

prEN 13400:1998 Footwear - Sampling location of components for footwear.

ISO 4648 Rubber, vulcanized - Determination of dimensions of test pieces and products for test purposes.

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## 3 Definitions

For the purposes of this standard the following definition applies:

### 3.1 dimensional stability

the reduction in the distance between two reference points on a test piece before and after heating in air under specified conditions. This shrinkage is expressed as percentage of the initial distance

## 4 Apparatus and material

The following apparatus and material shall be used:

**4.1 Steel rule**, marked in millimetres.

**4.2 Templates and scalpel** or other sharp knife, to cut two reference marks in the test specimen either 100 mm or 50 mm apart.

**4.3 Oven**, for heating the test specimens to 70 °C ± 2 °C and thermostatically controlled so that they are kept within 2 °C of the required temperature during the heating period.

**4.4 Device capable of measuring the distance between two cuts**, 50 mm apart or 100 mm apart, on a flat surface, to an accuracy of  $\pm 0,2$  mm.

This may consist of either:

- a) a steel rule, marked in millimetres as in 4.1, together with a x5 magnifying glass;  
or
- b) a travelling microscope or similar optical device with scale.

#### 4.5 Thickness gauge

Thickness gauge, standing on a firm base and loaded with a dead weight such that the presser foot applies a pressure of  $10 \text{ kPa} \pm 3 \text{ kPa}$ . The gauge has a presser foot which is flat, circular and  $10 \text{ mm} \pm 0,1 \text{ mm}$  in diameter, as defined in ISO 4648.

The gauge has a scale division of 0,01 mm.

### 5 Sampling and conditioning

The test pieces to be tested are taken in accordance with prEN 13400:1998. All test pieces shall be conditioned in accordance with EN 12222, before testing for a minimum of 24 h.

The test samples with the full thickness of the outsoles shall be tested.

Minimum three test pieces are necessary.

### 6 Test method

#### 6.1 Test specimen piece

Using a scalpel or other sharp knife (4.2) and a steel rule (4.1), cut the test specimens to the dimensions and tolerances given in figure 1.

Make two parallel reference cuts on the external surface not more than 0,5 mm deep across the full width of the test specimen on each side of it,  $100 \text{ mm} \pm 5 \text{ mm}$  apart for the larger test specimen and  $50 \text{ mm} \pm 5 \text{ mm}$  apart for the smaller test specimen.



## 6.2 Measurement before heat treatment ( $L_0$ )

Measure to within  $\pm 0,2$  mm the distance between the reference cuts along the centreline.

## 6.3 Heat treatment

Place the test specimens horizontally (supported in such a way as to ensure adequate air ventilation on all sides) in the oven (4.3) for  $24 \text{ h} \pm 0,5 \text{ h}$  at the temperature of  $70 \text{ }^\circ\text{C} \pm 2 \text{ }^\circ\text{C}$ .

## 6.4 Measurement after heat treatment ( $L$ )

Remove the test specimen from the oven at the end of the period of heat treatment. Keep the test specimens for at least 30 min in a standard atmosphere. If the test specimens are bowed, hold them flat for measurement.

If the measuring cuts have widened, take the point of the measurement as the centre of the cut. Measure to within  $\pm 0,2$  mm the distance between these cuts along centreline as described in figure 1 using an appropriate device.

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## 7 Expression of results (standards.iteh.ai)

For each test specimen, calculate the shrinkage of the distance between the reference cuts produced by the heat treatment and express this as a percentage of the original distance.

The worst of the three values will be the result.

Shrinkage  $S$ , in %, is to be calculated using the formula:

$$S = \frac{L - L_0}{L_0} \times 100$$

where

$L_0$  is the original distance between the reference cuts in millimetres, as recorded according to 6.2.

$L$  is the distance between the reference cuts after heat treatment, in millimetres, as recorded according to 6.4.