



SLOVENSKI STANDARD

SIST EN 13515:2004

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Footwear - Test methods for uppers and lining - Water vapour permeability and absorption

Footwear - Test methods for uppers and lining - Water vapour permeability and absorption

Schuhe - Prüfverfahren für Schäfte und Futter - Wasserdampfdurchlässigkeit und Wasserdampfaufnahme

Chaussures - Méthodes d'essai des tiges et des doublures - Perméabilité à la vapeur d'eau et absorption de la vapeur d'eau

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Ta slovenski standard je istoveten z: EN 13515:2001

ICS:

61.060

Obuvala

Footwear

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en

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 13515

December 2001

ICS 61.060

English version

Footwear - Test methods for uppers and lining - Water vapour permeability and absorption

Chaussures - Méthodes d'essai des tiges et des doublures
- Perméabilité à la vapeur d'eau et absorption de la vapeur
d'eau

Schuhe - Prüfverfahren für Obermaterialien und Futter -
Wasserdampfdurchlässigkeit und Wasserdampfaufnahme

This European Standard was approved by CEN on 22 November 2001.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Contents

	page
Foreword	3
1 Scope	4
2 Normative references	4
3 Terms and definitions	4
4 Apparatus and material	4
4.1 Water vapour permeability test method	4
4.2 Water vapour absorption test method (see Figure 2)	6
5 Sampling and conditioning	7
5.1 Water vapour permeability test method	7
5.2 Water vapour absorption test method	8
6 Test method	8
6.1 Water vapour permeability test method	8
6.1.1 Principle	8
6.1.2 Procedure	8
6.2 Water vapour absorption test method	9
6.2.1 Principle	9
6.2.2 Procedure	9
7 Expression of results	10
7.1 Water vapour permeability test method	10
7.2 Water vapour absorption test method	10
8 Test report	11
8.1 Water vapour permeability test method	11
8.2 Water vapour absorption test method	11

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 June 2002, and conflicting national standards shall be withdrawn at the latest by June 2002.

This European Standard is based on the IUP 15 method and the European Standard EN 344-1 "Requirements and test methods for safety, protective and occupational footwear for professional use.

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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EN 13515:2001 (E)

1 Scope

This standard specifies two test methods for assessing, respectively, the water vapour permeability and the water vapour absorption of uppers or complete upper assembly irrespective of the material, in order to assess the suitability for the end use.

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 (including amendments).

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

EN ISO 3696, *Water for analytical laboratory use - Specification and test methods (ISO 3696:1987)*.

EN 13512, *Footwear - Test methods for uppers and lining - Flex resistance*.

3 Terms and definitions

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

3.1

water vapour permeability

amount of water vapour a material will transmit through its structure expressed as mass of water transmitted per area of material per hour

3.2

water vapour absorption

amount of water vapour a material will absorb in a specified time expressed as mass of water per area of material

3.3

upper

material forming the outer face of the footwear which is attached to the sole assembly and covers the upper dorsal surface of the foot. In case of boots, this also includes the outer face of the material covering the leg. Only the materials that are visible are included, no account should be taken of underlying materials

3.4

complete upper assembly

finished upper, fully seamed, joined or laminated as appropriate, comprising the centre material and any lining(s) together with all components such as interlinings, adhesives, membranes, foams or reinforcements, but excluding toe puffs and stiffeners

NOTE The complete upper assembly may be flat, 2-dimensional or comprise lasted upper in the final footwear.

4 Apparatus and material

The following apparatus and material shall be used:

4.1 Water vapour permeability test method

4.1.1 Cylindrical test pots each with an internal height of 80 mm $\pm$ 10 mm and internal volume of 100 cm³ $\pm$ 20 cm³, and including the following:

4.1.1.1 One circular open end with an internal diameter of $D = 30 \text{ mm} \pm 1 \text{ mm}$ and is known to the nearest 0,1 mm.

4.1.1.2 A clamping ring with an internal diameter D .

4.1.1.3 Means of tightly clamping a test specimen between the clamping ring and the open end so that the pot is sealed by the test specimen.

4.1.2 Test machine (see Figure 1) including the following:

4.1.2.1 Vertically mounted turntable which:

a) has at least three test stations, each of which is capable of holding a test pot so that its axis is parallel to, and $67 \text{ mm} \pm 2 \text{ mm}$ from the axis of rotation of the turntable;

b) is rotated at $7,8 \text{ rad/s} \pm 0,5 \text{ rad/s}^{1)}$

4.1.2.2 Paddle type fan which:

a) has three flat blades inclined at 120° to one another. The blades shall be flat with approximate dimensions 90 mm x 75 mm;

b) is mounted so that its axle is coaxially aligned with the axis of the turntable (see 4.1.2.1) and the blades pass within a distance of $10\text{ mm} \pm 5\text{ mm}$ of the open ends of test pots (see 4.1.1) mounted on the turntable;

c) is rotated at $146 \text{ rad/s} \pm 10 \text{ rad/s}^{(1)}$ in a direction opposite to the direction of rotation of the turntable.

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Dimensions in millimetres

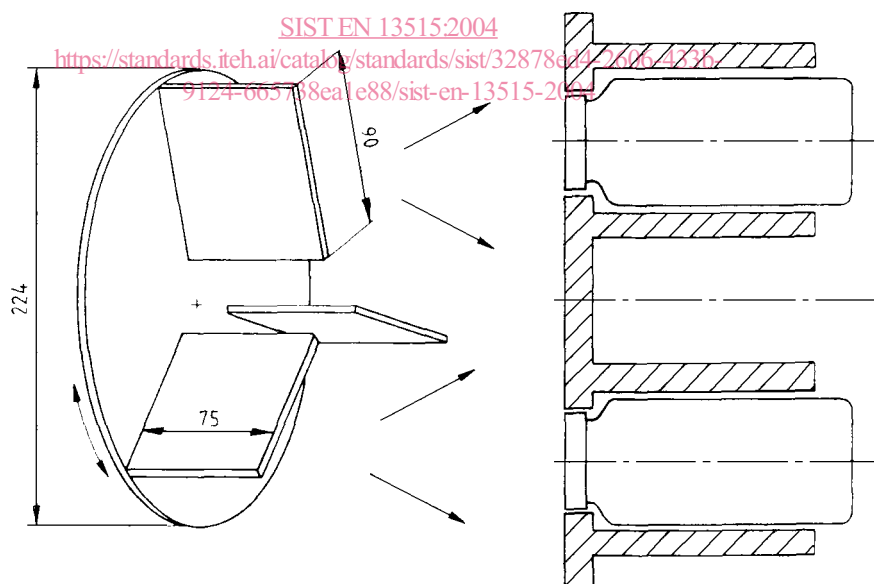


Figure 1 — Schematic diagram of apparatus to be used in the water vapour permeability test

4.1.3 Analytical balance capable of measuring mass up to 200 g to the nearest 1 mg.

4.1.4 Silica gel with a particle size greater than 2 mm and which is preferably self indicating.

Freshly dry the silica gel in a ventilated oven at $125^{\circ}\text{C} \pm 5^{\circ}\text{C}$ for at least 16 h and cool in a sealed container for at least 6 h. Once dried the silica gel will remain dry for many days if kept in air tight containers. Typically the colour of self indicating silica gel will turn from blue when dry to pink or colourless when saturated.

1) $1 \text{ rad} \approx 0,16 \text{ rev.}$

EN 13515:2001 (E)

4.1.5 Press knife, or similar cutting device, capable of cutting test specimens with a diameter which is sufficiently larger than D to enable a good seal to be made around the open end (see 4.1.1.1) of the pot.

4.2 Water vapour absorption test method (see Figure 2)

4.2.1 Two round test pots each with a volume of $100 \text{ cm}^3 \pm 20 \text{ cm}^3$, and including the following:

4.2.1.1 One open end with a flat annular surface of internal diameter of $35,0 \text{ mm} \pm 0,5 \text{ mm}$ and external diameter of at least 20 mm larger. The external diameter can be provided by a flange of minimum width 10 mm or by a cylinder of minimum wall thickness 10 mm.

4.2.1.2 A metal disk of diameter greater than 55 mm.

4.2.1.3 Means of tightly clamping a test specimen and a piece of impermeable material (see 4.2.5) between the open end and the disk so that the pot is sealed by the test specimen.

4.2.2 Analytical balance capable of measuring mass up to 100 g to the nearest 1 mg.

4.2.3 Device capable of measuring time up to 8 h to the nearest 0,1 h, e.g., a stopwatch.

4.2.4 Distilled or deionised water complying with EN ISO 3696.

4.2.5 Two circular pieces of impermeable material of minimum diameter 55 mm.

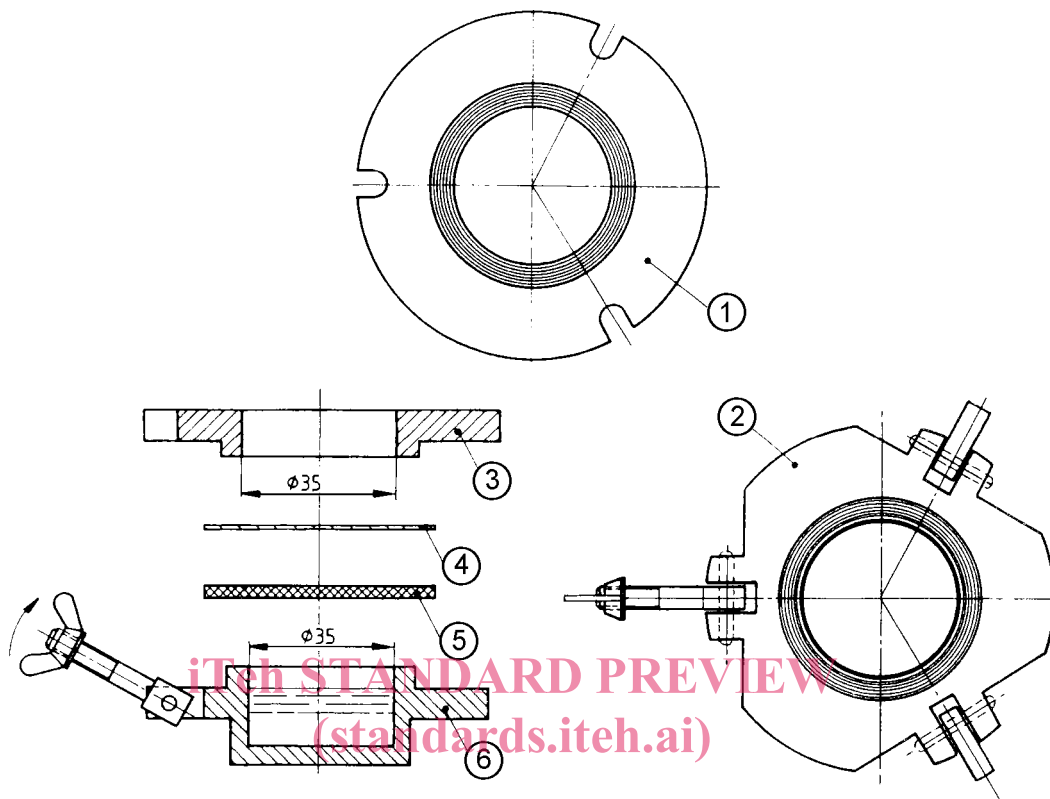
4.2.6 Cutting device such as a press knife, capable of cutting test specimens of diameter $45 \text{ mm} \pm 5 \text{ mm}$.

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Dimensions in millimetres

**Key**

- 1 Top
- 2 Bottom
- 3 Top
- 4 Seal
- 5 Specimen
- 6 Bottom

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Figure 2 — Apparatus for determination of water vapour absorption**5 Sampling and conditioning****5.1 Water vapour permeability test method**

5.1.1 Unless otherwise specified, cut three samples of dimensions 70 mm x 45 mm.

5.1.2 For sheet materials cut test specimens from a range of positions across the full usable width and length of the sheet material. For a material with a woven structure this should prevent any two specimens containing the same warp or weft threads. Prepare test pieces from complete upper assemblies when the lining material is permanently attached to the upper material.

5.1.3 For test specimens cut from footwear uppers avoid any areas containing seams or perforations and any other design features which mean that the test specimen will not be of uniform thickness across its entire surface area.

NOTE It may not be possible to cut a test specimen of sufficient size from certain types of footwear, especially children's, and the test specimen size should not be reduced. If it is not possible to cut the correct size test specimen from a shoe upper the materials themselves must be tested.