



**SLOVENSKI STANDARD**  
**SIST EN 12784:2000**  
**01-december-2000**

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**Footwear - Test methods for whole shoe - Thermal insulation**

Footwear - Test methods for whole shoe - Thermal insulation

Schuhe - Prüfverfahren für den ganzen Schuh - Kälteisolierung

Chaussures - Méthodes d'essai applicables à la chaussure entière - Isolation thermique

**Ta slovenski standard je istoveten z: EN 12784:1999**

[SIST EN 12784:2000](https://standards.iteh.ai/catalog/standards/sist/2cb65171-01a7-4870-b309-d92e9ffe87b0/sist-en-12784-2000)

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**ICS:**

61.060

Obuvala

Footwear

**SIST EN 12784:2000**

**en**

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

EN 12784

December 1999

ICS 61.060

English version

Footwear - Test methods for whole shoe - Thermal insulation

Chaussures - Méthodes d'essai applicables à la chaussure  
entière - Isolation thermique

Schuhe - Prüfverfahren für den ganzen Schuh -  
Kälteisolierung

This European Standard was approved by CEN on 23 October 1999.

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 Central Secretariat 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 Central Secretariat 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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## 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 2000, and conflicting national standards shall be withdrawn at the latest by June 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 European standard describes a method for the measurement of insulation against cold of footwear.

It applies to all types of closed footwear or boot.

## 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 into 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.*

## 3 Terms and definitions

For the purposes of this standard the following definition applies:

### 3.1

#### thermal insulation

temperature difference on the inner surface of the vamp and insoles after 30 min under the specific test conditions

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## 4 Apparatus and material

The following apparatus and material shall be used:

**4.1 Insulated cold box**, the internal air temperature of which can be regulated to  $-20\text{ °C} \pm 2\text{ °C}$  (see figure 1).

**4.2 Heat transfer medium**, comprising steel balls of 5 mm diameter and of total mass of 4 kg.

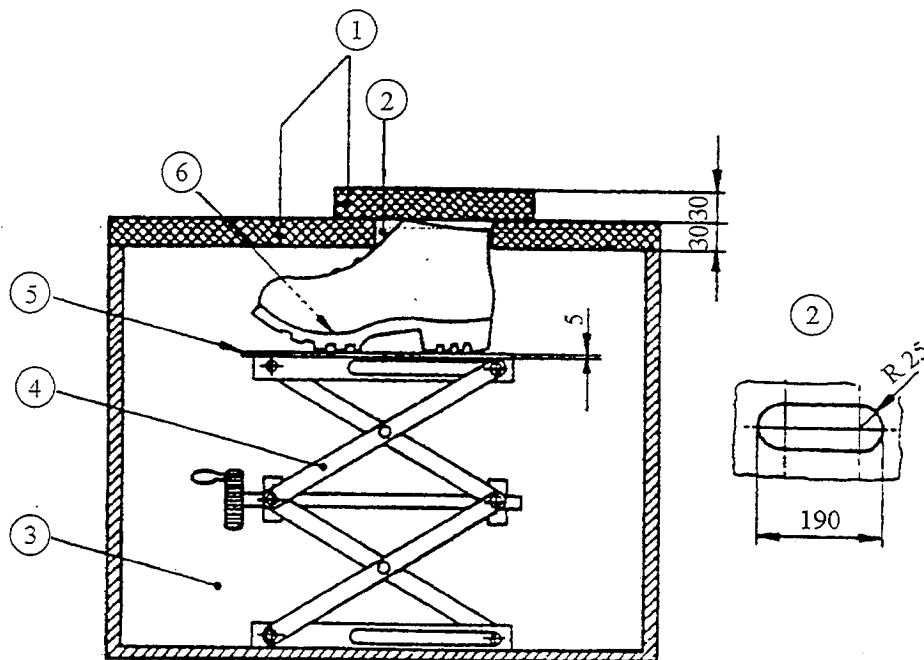
NOTE Ball bearings complying with the requirements of ISO 3290 are suitable.

**4.3 Temperature measuring system, for example, thermocouple**, copper/copper-nickel thermocouple, soldered to a copper disc  $2\text{ mm} \pm 0,1\text{ mm}$  thick and  $15\text{ mm} \pm 1\text{ mm}$  diameter.

**4.4 Temperature recording device**, with a compensator, suitable for use with 4.3.

**4.5 Copper/zinc alloy plate (150 mm x 350 mm)**, of 5 mm thickness, positioned as illustrated in figure 1.

Dimensions in millimetres



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- 1 Thermal insulating cover
- 2 Elongated hole
- 3 Cold box
- 4 Laboratory jack
- 5 Cooper / Zinc plate
- 6 Measuring point for temperature

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**Figure 1 – Cold insulation test apparatus**

## 5 Sampling and conditioning

Minimum two test pieces are necessary.

Use the complete item of footwear as the test piece.

Condition it for 24 hours (See EN 12222).

The temperature measuring system and the balls shall also be conditioned according EN 12222.

Fix one temperature measuring system on the insocks and one temperature measuring system on the inside of the upper assembly in the vamp area and place the steel balls inside the footwear. If the upper is not high enough to accommodate the balls, increase its height with a collar.

Leave in a conditioned environment in accordance with EN 12222 until the temperature measuring shows a stable temperature equal to that of the surrounding environment.

## 6 Test method

Adjust and maintain the temperature of the cold box to  $-20\text{ °C} \pm 2\text{ °C}$  during the test and measure the temperature at the beginning of the test. Place the test piece on the laboratory jack inside the cold box, adjusting the height so that the top line of the footwear is level with the opening with the heat insulating cover (see Figure 1). Close the top of the footwear in order to prevent cold air entering through it so that the top line of the footwear is level with the opening and seal the opening with a heat insulating cover.

Use the temperature measuring device (4.4) to record the temperature of the thermocouple when the item of the footwear has been in the cold box (4.1) for a total of 30 min. Calculate the reduction in temperature that has occurred over 30 min.

NOTE It is possible to use the temperature recording device connected to the temperature measuring system to measure the temperatures as a function of time, recording the temperature decrease graphically.

## 7 Expression of results

Note the final temperatures attained.

Results (one in the insole and one in upper) is the average of the values.

## 8 Test report

The test report shall include the following information:

- reference to this draft standard; **EN 12784:2000**
- the difference in temperatures at the measuring point on insole; **EN 12784:2000**
- the difference in temperatures at the measurement point on upper; **EN 12784:2000**
- full description of samples tested including commercial styles codes, colours, nature, etc.;
- description of the sampling procedure, where relevant;
- any deviations from this test method.