SLOVENSKI STANDARD
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Footwear - Test methods for uppers - High temperature behaviour

Footwear - Test methods for uppers - High temperature behaviour

Schuhe - Prüfverfahren für Obermaterialien - Verhalten bei hohen Temperaturen

Chaussures - Méthodes d'essai des tiges - Comportement aux températures élevées

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Footwear - Test methods for uppers - High temperature behaviour

Chaussures - Méthodes d'essai des tiges - Comportement aux températures élevées

Schuhe - Prüfverfahren für Schäfte - Verhalten bei hohen Temperaturen

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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of an identical text or by endorsement, at the latest by May 2002, and conflicting national standards shall be withdrawn at the latest by May 2002.

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.

1 Scope

This European Standard specifies a test method for determining the effect of heat on the tensile strength 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.*

prEN 13522 *Footwear - Test methods for uppers - Tensile strength and elongation.*

3 Terms and definitions

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

3.1
high temperature behaviour
resistance of a material to elevated temperatures as measured by the effect on the tensile properties of the material. Particularly applicable to materials used in vulcanised footwear

3.2
upper
materials forming the outer surface of the footwear which is attached to the sole assembly and covers the upper dorsal surface of the foot. In the 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

3.3
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 can 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 A rapid acting platen press with:

4.1.1 The capability of applying a pressure of 1 000 kPa ± 50 kPa on an area of 160 mm x 25 mm.

4.1.2 Upper and lower platens with smooth metal surfaces.

4.1.3 Means of maintaining upper and lower platen temperatures as specified in Table 1.

4.2 A thermometer capable of measuring the temperature of the surface of the platens to the nearest 1 °C.

NOTE A surface mounting thermocouple and digital meter is suitable.

5 Sampling and conditioning

5.1 Prepare test specimens in accordance with prEN 13522.

NOTE Test specimens can be taken from materials likely to be used for uppers or from made-up uppers or finished footwear. Prepare test pieces from complete upper assemblies when the lining material is permanently attached to the upper material.

6 Test method

6.1 Principle

Test specimens are pressed between two hot rigid surfaces for a predetermined time. The effect of this heat treatment on breaking strength and elongation is then determined in accordance with prEN 13522.

6.2 Procedure

6.2.1 Adjust the temperature of the platens (4.1.2) to the required temperature, see Table 1.

6.2.2 Place one of the test specimens in the press (4.1) so that the surface which would be closer to the foot in the finished footwear is lowermost. Immediately close the press and apply a pressure of 1 000 kPa ± 50 kPa to the rectangular pieces of material for the required time, see Table 1.

6.2.3 Repeat the procedure in 6.2.2 for the remaining test specimens.

6.2.4 Store all the test specimens in a standard controlled environment as specified in EN 12222 for at least 72 h.

6.2.5 Follow the procedure described in prEN 13522 to determine the mean breaking force and mean elongation at break.

Table 1 — Suggested platen temperatures and pressing times for simulating the moulding-on of rubber

Application	Upper platen temperature °C	Lower platen temperature °C	Pressing time min
Unheated lasts	105 ± 5	85 ± 5	12,0 ± 0,5
Heated lasts	180 ± 5	110 ± 5	8,0 ± 0,5

7 Expression of results

The percentage change in the values of the breaking force or the elongation break at break is calculated using the formula:

$$\frac{\overline{x_a - x_0}}{\overline{x_0}} \cdot 100$$

where

$\overline{x_0}$ is the mean value of the tensile property before the heat treatment;

$\overline{x_a}$ is the mean value of the tensile property after the heat treatment;

8 Test report

The test report shall include the following information:

a) for each heating condition used:

- the temperature of the platens, in °C, and pressing time used, in min;
- the mean breaking force value, in newtons per millimetre, and the mean elongation at break, in %, determined before and after the heat treatment for each test direction and their percentage change for each test direction as determined in accordance with 6.2.5;

b) a description of the material, including commercial references (style codes etc.);

c) a description of any lining or other reinforcement present;

d) reference to the method of test;

e) date of testing;

f) any deviations from this test method.