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Footwear — Test methods for insoles — Heel pin holding strength

Chaussures — Méthodes d'essai applicables aux premières de montage — Tenue des clous pour talon

Reference number
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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation on the voluntary nature of standards, themeaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 216, *Footwear*.

This second edition cancels and replaces the first edition (ISO 20867:2001), which has been technically revised.

Footwear — Test methods for insoles — Heel pin holding strength

1 Scope

This document specifies a method to determine the ability of an insole component to hold a heel pin and to prevent its head from being pulled through the insole component.

The method is applicable to insoles used in the seat of footwear with inside attached heels, and also to seat components where outside heel attachments are used and the heel pin is clenched.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 5893, *Rubber and plastics test equipment — Tensile, flexural and compression types (constant rate of traverse) — Specification*

ISO 17709, *Footwear — Sampling location, preparation and duration of conditioning of samples and test pieces*

ISO 18454, *Footwear — Standard atmospheres for conditioning and testing of footwear and components for footwear*

3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

3.1
heel pin holding strength
force required to push a simulated heel pin head through the insole material

4 Apparatus and material

The following apparatus and material shall be used:

4.1 **Drill**, fitted with twist drill bit, 2,0 mm ± 0,1 mm diameter.

4.2 **Tensile-testing machine (dynamometer)**, shall comply with the requirements of ISO 5893, to an accuracy corresponding to grade B, with a constant rate of traverse of 100 mm/min ± 20 mm/min. Autographic recording of force or a maximum force pointer is recommended.

4.3 Attachment for the dynamometer, consisting of the following two parts:

a) **Rigid test piece supporting plate**, with a 12 mm diameter circular hole and a means of attachment to the force measuring system, so that the line of action of the force applied during testing passes through the centre of the hole and is perpendicular to the plate.

b) **Fitting for the drive system**, providing a means of pushing a rod through the test piece; the leading part of the rod consists of a 2 mm diameter shank, and the remainder a head of 4,0 mm ± 0,2 mm diameter, the two sections joining at a shoulder in the form of a plane perpendicular to the axis of the rod (These dimensions correspond to those of 8 mm × 14 mm gauge heel pin).

The combinated attachment shall be designed to ensure that the axis of the rod passes through the centre of the hole in the test piece supporting plate (see Figure 1).

4.4 Dial micrometer gauge, complying with the following requirements:

The gauge shall stand on a firm base, it shall be dead weight loaded and the force applied shall be 3,85 N ± 0,10 N. The presser foot shall be flat, circular and 10,0 mm in diameter, and its direction of movement shall be normal to the face of the anvil. The anvil shall be the flat, horizontal surface of a cylinder of diameter 10,0 mm projecting 3 mm from the surface of a flat circular platform of diameter 50 mm. The axes of the presser foot, the platform and the projecting anvil shall coincide and shall be the same as the direction of movement of the foot. The faces of the foot and anvil shall be parallel for all positions of the foot, the error not exceeding 0,005 mm. The dial gauge shall be graduated to read to 0,01 mm directly. It shall have a dial of sufficiently large size to give an open scale and a suitable pointer close to the scale to minimize errors due to parallax. The readings of the gauge shall be accurate to 0,01 mm all along the scale.

4.5 Distilled water.

4.6 Rectangular knife, to cut a test piece of 80 mm × 20 mm.

The inner surface of the knife shall be angled outward from the cutting edge at approximately 5° to the vertical so that when the test piece is cut it passes through the knife without damage to the test piece edge.

5 Sampling and conditioning

Using the rectangular knife (4.6), cut two rectangular test pieces of 80 mm × 20 mm from the shoe insoles, cut the insoles or the component as supplied. Use one test piece for dry testing (see 6.1) and one for wet testing (see 6.2).

If the test pieces are taken from the shoe insoles or cut insoles, sampling shall be done in accordance with ISO 17709.

The test piece for dry testing (see 6.1) shall be conditioned in accordance with ISO 18454 for a minimum of 48 h before testing and the test shall be carried out in this atmosphere.

The test piece for wet testing requires no conditioning before the method described in 6.2 is carried out.

6 Test methods

6.1 Dry testing

6.1.1 Measure the thickness of the test piece, using the micrometer gauge (4.4), at three points on the centre line parallel to the 80 mm side, at distances 20 mm, 40 mm and 60 mm respectively from one end.

6.1.2 Using the 2,0 mm diameter drill bit (4.1), make three holes along the centre line of the test piece parallel to the 80 mm side, at distances 20 mm, 40 mm and 60 mm respectively from one end.

6.1.3 Fit the shank of the rod through one hole with the rod head on the foot side of the material. Operate the dynamometer (4.2) at a jaw separation speed of 100 mm/min ± 20 mm/min, continuously recording the force, until the insole fails. Note the maximum force exerted, correcting, if necessary, for any effect of the weight of the test attachment on the force recorded.

6.1.4 Repeat the method described in 6.1.3 using each of the other two holes in the test piece.

6.2 Wet testing

6.2.1 Applying the procedure described in 6.1.1 measure the thickness of the test piece. Using the 2,0 mm diameter drill bit (4.1), make three holes along the centre line parallel to the 80 mm side at distances of 20 mm, 40 mm and 60 mm respectively from one end. Soak the test piece in water at 23 °C ± 2 °C for 6 h. Remove it from the water and blot the surface.

6.2.2 Without delay, carry out the method described in 6.1.3 and 6.1.4.

7 Expression of results

7.1 Calculate separately the mean of the three maximum forces noted for each test piece and express the results in newton, as the heel pin holding strength of the dry and the wet insole material respectively.

7.2 Calculate also the mean value for the thickness of each test piece.

8 Test report

The test report shall include the following information:

a) a reference to this document, i.e. ISO 20867:2018;

b) the results, for the wet and the dry insole material, expressed in accordance with 7.1;

c) the thickness of the insole material, expressed in accordance with 7.2;

d) nature and full identification of the sample;

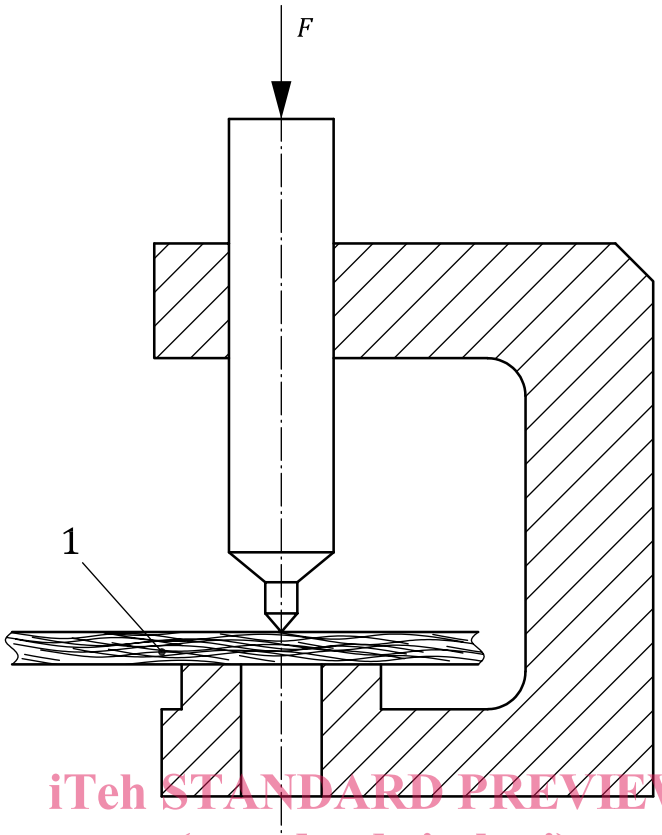
e) description of sampling procedure, where relevant;

f) reference to the method of test;

g) details of any deviation from the standard test procedure;

h) the date of testing;

i) standard atmospheric conditions observed during the test.



Key

1 test piece

F applied force

Figure 1 — Attachment for the tensile-testing machine