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Footwear — Test methods for stiffeners and toepuffs — Bondability

Chaussures — Méthodes d'essai pour contreforts et bouts-durs — Aptitude au collage

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, the meaning 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 20863:2004), which has been technically revised.

Footwear — Test methods for stiffeners and toepuffs — Bondability

1 Scope

This document specifies a method for the determination of the bondability of heat activated and solvent activated stiffeners and toepuffs to upper and lining materials.

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 7500-1, *Metallic materials — Calibration and verification of static uniaxial testing machines — Part 1: Tension/compression testing machines — Calibration and verification of the force-measuring system*

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
bondability
aptitude of a material to be bonded to itself or to other material by applying pressure and/or heat and eventually adhesive

4 Apparatus and materials

The following apparatus and materials shall be used:

4.1 Tensile testing machine, with a jaw separation rate of 100 mm/min ± 10 mm/min, an appropriate force range (this will usually be less than 100 N), capable of measuring the force to an accuracy of better than 2 % as specified by class 2 in ISO 7500-1, which registers the force applied in terms of the displacement.

4.2 Press knife, or other means of cutting rectangular test specimens of (150 mm ± 10 mm) × (30 mm ± 2 mm).

4.3 Press, with the following characteristics:

4.3.1 Heated plates, which can maintain a pre-established temperature with an accuracy of ±5 °C.

4.3.2 **Operating pressure**, of 245 kPa[1)] ± 5 kPa.

4.4 **Reference leather L1**, Chrome tanned cowhide upper leather, full grain (thickness of 1,5 mm to 1,8 mm), with the technical data of the Test material L1 included in CEN/TR 15990.

4.5 **Non-woven fabric**, of 150 g/m^2 ± 20 g/m^2.

4.6 **Water distilled or deionised**, according to grade 3 of ISO 3696.

4.7 **Acetone** or **other organic solvent type ketones**.

5 Sampling and conditioning

5.1 Method 1: Heat activated materials

5.1.1 Cut at least two strips for each temperature tested of (150 mm ± 10 mm) × (30 mm ± 2 mm), from the sample and the same number of strips of the same size from the non-woven fabric and the reference leather (4.4) or the material to be used.

5.1.2 Make a "compound test piece" of leather-sample-non-woven fabric. A strip of paper is placed on one of the short sides between the leather and the sample, so that at least 20 mm remain unstuck and so that the ends can be held in the jaws of the tensile testing machine.

NOTE The side of the material to be tested is the one in contact with the standard leather, i.e. the side which, in the shoe, will be in contact with the upper leather.

5.1.3 Unless the manufacture establishes the application conditions, follow 5.1.4 and 5.1.5.

5.1.4 Place the compound test piece between both press plates heated (4.3.1) to 70 °C ± 5 °C and apply a pressure (4.3.2) of 245 kPa ± 5 kPa for (10 ± 1) s.

5.1.5 Repeat the procedure described in 5.1.2 and 5.1.4 with the other test pieces and both press plates heated to 90 °C ± 5 °C, 110 °C ± 5 °C, 130 °C ± 5 °C and 150 °C ± 5 °C, respectively.

5.1.6 Condition the set test pieces in a conditioned environment as specified in ISO 18454 for 24 h.

5.2 Method 2: Solvent activated materials

5.2.1 Cut at least two strips of (150 mm ± 10 mm) × (30 mm ± 2 mm) from the sample and two strips of the same size from the non-woven fabric (4.5) and the reference leather (4.4) or the material to be used.

5.2.2 Activate the test specimen by applying acetone or other solvent (4.7) to it until it is uniformly wetted, then leave it for 2,5 min ± 0,5 min.

5.2.3 Make a "compound test piece" of leather-sample-non-woven fabric. A strip of paper is placed on one of the short sides between the leather and the sample, so that at least 20 mm remain unstuck and so that the ends can be held in the jaws of the tensile testing machine.

5.2.4 Unless the manufacturer establishes the application conditions, place the compound test piece between both press plates heated (4.3.1) to 50 °C ± 5 °C, and apply a pressure (4.3.2) of 245 kPa ± 5 kPa for 10 s.

1) 245 kPa are equal to 2,5 kg/cm^2.

5.2.5 Condition the set test pieces in a conditioned environment as specified in ISO 18454 for 24 h.

6 Procedure

6.1 Fix the reference leather of the compound test piece in one of the jaws of the tensile testing machine and the end of the sample and the non-woven fabric in the other jaw.

6.2 Operate the tensile testing machine so that the jaw separates at a speed of 100 mm/min ± 10 mm/min.

6.3 Stop the tensile testing machine when approximately half the length of the test piece has been unbonded.

6.4 Repeat the procedure described in 6.1, 6.2 and 6.3 with the other test pieces.

6.5 Submerge the part of the test pieces which are still bonded, in distilled water for (6 ± 0,5) h.

6.6 Remove a test piece from the water, hold the free ends of the wet test piece in the jaws of the tensile testing machine and unbond the rest of the test piece.

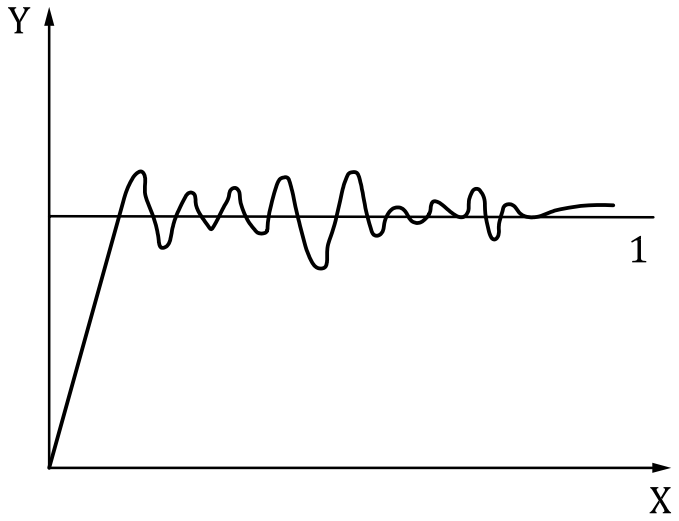
6.7 Repeat the procedure described in 6.6 with the other test pieces.

7 Expression of results

7.1 Dry bondability

7.1.1 Calculate the average value of force (see Figure 1) obtained for 6.3 and 6.4 for each one of the test pieces, in newtons.

7.1.2 Divide the average value of force obtained for each one of the test pieces by the width of the test piece, measured in millimetres, and express the dry bondability, in newtons per millimetre.



Key

X displacement

Y force, in N

1 average

Figure 1 — Example of diagram force/displacement

7.2 Wet bondability

7.2.1 Calculate the average value of force obtained for 6.6 and 6.7 for each one of the wet test pieces, in newtons.

7.2.2 Divide the average value of force obtained in each one of the test pieces by the width of the test pieces, measured in millimetres, and express the wet bondability in newtons per millimetre.

8 Test report

The test report shall include the following information:

a) a reference to this document, i.e. ISO 20863:2018;

b) a description of the samples tested, including commercial styles, codes, colours, nature, etc.;

c) the average dry bondability or the average for each temperature tested as shown in 7.1;

d) the average wet bondability or the average for each temperature tested as shown in 7.2;

e) date of testing;

f) any deviation from this standard test method;

g) a reference to the method of test (wet or dry bondability).