
**Footwear — Test methods for uppers —
Delamination resistance**

*Chaussures — Méthodes d'essai des tiges — Résistance au
dé laminage*

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[ISO 17698:2003](https://standards.iteh.ai/catalog/standards/sist/41165dcc-b5fc-4195-a881-dee74fe0bc7a/iso-17698-2003)

[https://standards.iteh.ai/catalog/standards/sist/41165dcc-b5fc-4195-a881-
dee74fe0bc7a/iso-17698-2003](https://standards.iteh.ai/catalog/standards/sist/41165dcc-b5fc-4195-a881-dee74fe0bc7a/iso-17698-2003)



PDF disclaimer

This PDF file may contain embedded typefaces. In accordance with Adobe's licensing policy, this file may be printed or viewed but shall not be edited unless the typefaces which are embedded are licensed to and installed on the computer performing the editing. In downloading this file, parties accept therein the responsibility of not infringing Adobe's licensing policy. The ISO Central Secretariat accepts no liability in this area.

Adobe is a trademark of Adobe Systems Incorporated.

Details of the software products used to create this PDF file can be found in the General Info relative to the file; the PDF-creation parameters were optimized for printing. Every care has been taken to ensure that the file is suitable for use by ISO member bodies. In the unlikely event that a problem relating to it is found, please inform the Central Secretariat at the address given below.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[ISO 17698:2003](https://standards.iteh.ai/catalog/standards/sist/41165dcc-b5fc-4195-a881-dee74fe0bc7a/iso-17698-2003)

<https://standards.iteh.ai/catalog/standards/sist/41165dcc-b5fc-4195-a881-dee74fe0bc7a/iso-17698-2003>

© ISO 2003

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 17698 was prepared by CEN (as EN 13514:2001) and was adopted, under a special “fast-track procedure”, by Technical Committee ISO/TC 216, *Footwear*, in parallel with its approval by the ISO member bodies.

iTeh STANDARD PREVIEW

For the purposes of international standardization, a list of corresponding International and European Standards for which equivalents are not given in EN 13514 has been added as Annex ZZ.

[ISO 17698:2003](https://standards.iteh.ai/catalog/standards/sist/41165dcc-b5fc-4195-a881-dee74fe0bc7a/iso-17698-2003)

<https://standards.iteh.ai/catalog/standards/sist/41165dcc-b5fc-4195-a881-dee74fe0bc7a/iso-17698-2003>

Contents

	page
Foreword.....	3
1 Scope	4
2 Normative references	4
3 Term and definition.....	4
4 Apparatus and material	4
5 Sampling	5
6 Test method.....	6
6.1 Principle	6
6.2 Procedure	6
7 Expression of results	9
8 Test report	9

iTeh STANDARD PREVIEW
(standards.iteh.ai)
<https://standards.iteh.ai/catalog/standards/sist/41165dcc-b5fc-4195-a881-dee74fe0bc7a/iso-17698-2003>

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.

This European Standard is based on the IULTCS/IUF 470 method (ISO 11644:1993 "Leather - Test for adhesion of finish").

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.

iTeh STANDARD PREVIEW (standards.iteh.ai)

[ISO 17698:2003](#)

<https://standards.iteh.ai/catalog/standards/sist/41165dcc-b5fc-4195-a881-dee74fe0bc7a/iso-17698-2003>

iTeh STANDARD PREVIEW
(standards.iteh.ai)

ISO 17698:2003

<https://standards.iteh.ai/catalog/standards/sist/41165dcc-b5fc-4195-a881-dee74fe0bc7a/iso-17698-2003>

EN 13514:2001 (E)

1 Scope

This European Standard specifies a test method for determining the delamination resistance of uppers 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 12749, *Footwear - Ageing conditioning.*

EN 13400, *Footwear - Sampling location, preparation and duration of conditioning of samples and test pieces.*

EN ISO 3696, *Water for analytical laboratory use - Specification and test method.*

EN ISO 7500-1, *Metallic materials – Verification of static uniaxial testing machines. Part 1: Tension/compression testing machines.*

ITeH STANDARD PREVIEW
(standards.iteh.ai)

3 Term and definition

ISO 17698:2003

<https://standards.iteh.ai/catalog/standards/sist/41165dcc-b5fc-4195-a881-6c74c60c7a5c/iso-17698-2003>

For the purposes of this European Standard, the following term and definition applies.

3.1

delamination resistance

strength of adhesion between a coating and its base material

4 Apparatus and material

The following apparatus and material shall be used:

4.1 Tensile testing machine with: a jaw separation rate of 100 mm/min \pm 10 mm/min, a force range appropriate to the specimen under test (normally a range of 0 N to 200 N is suitable for test specimens of polyurethane coated fabric) and the capability of measuring the force to an accuracy greater than 2 % as specified by Class 2 in EN ISO 7500-1.

4.2 Autographic recorder or similar means of continuously recording the force.

4.3 Rapid acting platen press capable of applying a pressure of 550 kPa \pm 50 kPa on an area of 50 mm x 70 mm.

4.4 Rubber pad of thickness at least 10 mm and hardness 40 IRHD \pm 10 IRHD.

4.5 Radiant heater capable of heating a dry adhesive film on resin rubber to 80 °C to 90 °C within 15 s, normally mounting the adhesive film from 100 mm to 150 mm from a heater element of power approximately 3 kW and area of approximately 0,06 m² is satisfactory. Commercial equipment used for reactivating soles and uppers in footwear production is suitable.

4.6 Means of checking that the temperature of the adhesive film is within the range 80 °C to 90 °C. Heat sensitive crayons are suitable, preferably with a melting temperature of 83 °C. Also suitable are infra-red temperature measuring guns.

4.7 Resin rubber, thickness 3,5 mm ± 0,2 mm and hardness 95 IRHD ± 2 IRHD with a surface peel tear strength greater than that of the test specimen.

4.8 A solvent-borne polyurethane adhesive which will bond well to resin rubber and the coated surface of the test specimen.

4.9 An adhesion primer, such as a halogenating solution used in footwear manufacture for rubber can be helpful in producing satisfactory bonds.

4.10 Cutting device such as a press knife or scissors capable of cutting rectangular test specimens of dimensions (50 mm ± 1 mm) x (70 mm ± 1 mm). In addition, if carrying out the test on hydrolysed test specimens, a second cutting device is required to cut square test specimens (70 mm ± 1 mm) x (70 mm ± 1 mm).

4.11 Cutting device such as a sharp knife or rotary disc cutter for cutting test specimens from bonded test assemblies. This device shall neither unduly compress nor force apart the layers of the test assembly at the edges during cutting and therefore a press knife is unsuitable.

4.12 If testing the wet adhesion strength, **distilled or deionised water** complying with grade 3 of EN ISO 3696.

4.13 Timer capable of recording times up to 30 s to the nearest 0,5 s.

iTeh STANDARD PREVIEW (standards.iteh.ai)

5 Sampling

5.1 For the dry tests, mark six rectangular boxes (70 mm ± 1 mm) x (50 mm ± 1 mm): two with their longer edges parallel to the along direction of sheet material (machine or backbone direction) or X-axis (as defined in EN 13400) of the upper, and four with their longer edges perpendicular to this, on the reverse of the sheet material or uppers.

5.2 For the wet tests mark either a further two rectangular boxes (70 mm ± 1 mm) x (50 mm ± 1 mm), putting the 50 mm edge in the direction with the lowest dry peel strength (if already known), or a further six boxes as described in 5.1 on the reverse of the material or uppers.

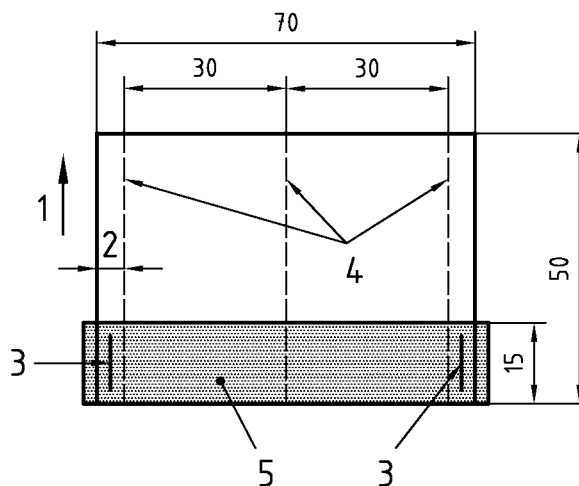
5.3 Make further marks on the material to divide each of the rectangles marked in 5.1 and 5.2 into two equal halves (35 mm ± 0,5 mm) x (50 mm ± 1 mm). Mark the along direction or X-axis in each of the smaller rectangles. Use an arrow and ensure that the arrow heads point in the same direction. For uppers, the arrow head shall point towards the toe.

5.4 For hydrolysis tests, mark a further two 70 mm ± 1 mm square boxes with their edges parallel to the along direction or X-axis. Mark the along direction or X-axis using an arrow as in 5.3.

NOTE Since ink marks can be removed by the wetting or hydrolysis treatments it is advisable to also use a code of cut off corners.

5.5 Cut from the sheet material or uppers, the rectangular boxes marked in 5.1 and 5.2 and the squares marked in 5.4. Each piece of material is later cut to give two test specimens 30 mm ± 0,5 mm x 50 mm ± 1 mm, see Figure 1. After bonding to resin rubber, each piece of material is later cut to give two peel test specimens. With some shoe styles it will not be possible to cut the correct size pieces of material. In such cases it will be necessary to reduce the size of the pieces to a minimum of (40 mm ± 1 mm) x (50 mm ± 1 mm). In all such cases, the pieces will give one test specimen only and shall not be further sub-divided as in 5.3.

5.6 Cut a rectangular piece of resin rubber (see 4.7) measuring (50 mm ± 1 mm) x (70 mm ± 1 mm) for each piece of material cut in 5.5. If the setting of the radiant heater unit (see 4.5) needs to be checked cut one or two additional pieces of rubber.

**Key**

- 1 Direction of peel
- 2 Approximately 5 mm
- 3 Staple
- 4 Cut lines
- 5 Paper strip

Figure 1 — Test specimen assembly

NOTE Specimens can be taken from materials likely to be used for uppers or from made-up uppers or finished footwear.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

6 Test method**6.1 Principle**

ISO 17698:2003

<https://standards.iteh.ai/catalog/standards/sist/41165dcc-b5fc-4195-a881-407420b7a51c/iso-17698-2003>

The coated surface of a test specimen is bonded to a piece of resin rubber using a strong adhesive. The force required to peel the test specimen from the resin rubber leaving the coating attached to the rubber is measured using a tensile testing machine. The test can also be carried out on wet and hydrolysed test specimens.

6.2 Procedure

6.2.1 Place a strip of paper ($75 \text{ mm} \pm 5 \text{ mm}$) x ($15 \text{ mm} \pm 3 \text{ mm}$) to the coated side of each piece of material cut in 5.5 so that it is against one of the longer edges. Attach the paper strips with a staple (or similar) at each end so that the staples are positioned as shown in Figure 1. With the four test specimens cut for the dry test where the arrow points toward a longer edge, two shall have the paper strip attached along the edge to which the arrow is pointing and two shall have the paper strip along the opposite edge.

6.2.2 If an adhesion primer (see 4.9) is available, apply this in accordance with the suppliers instructions to the whole area of the reverse side of each piece of resin rubber cut in 5.6.

6.2.3 Allow the resin rubber pieces to dry full in accordance with the suppliers recommendations.

6.2.4 Apply the polyurethane adhesive (see 4.8) in accordance with the suppliers instructions to the whole area of the reverse of each piece of resin rubber.

6.2.5 Similarly apply adhesive to the coated surface of each piece of material under test so that it just overlaps the paper strip.

6.2.6 Allow the adhesive to dry for at least 1 h.

6.2.7 If the time required to heat the adhesive film to a temperature of between $80 \text{ }^{\circ}\text{C}$ and $90 \text{ }^{\circ}\text{C}$ using the radiant heater is not known, then measure this time using the extra pieces of rubber cut in 5.6 and the means of checking the temperature of the adhesive film (see 4.6). If this time is found to be longer than 15 s then either