



Technical Specification

ISO/TS 20952

Footwear — Performance requirements for components for footwear — Uppers

*Chaussures — Exigences de performance pour les composants des
chaussures — Tiges*

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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.

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 document 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 of 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 www.iso.org/iso/foreword.html.

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

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Footwear — Performance requirements for components for footwear — Uppers

1 Scope

This document establishes the performance requirements for upper components for footwear (not for the finished footwear), irrespective of the material, in order to assess the suitability for the end use. It also establishes the test methods to be used to evaluate the compliance with the requirements.

This document applies to uppers for all kinds of footwear as defined in [Clause 4](#).

This document can be used as a reference by the footwear manufacturer and the supplier.

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 17693, *Footwear — Test methods for uppers — Resistance to damage on lasting*

ISO 17694, *Footwear — Test methods for uppers and lining — Flex resistance*

ISO 17696, *Footwear — Test methods for uppers, linings and insoles — Tear strength*

ISO 17697, *Footwear — Test methods for uppers, lining and insoles — Seam strength*

ISO 17698, *Footwear — Test methods for uppers — Delamination resistance*

ISO 17699, *Footwear — Test methods for uppers and lining — Water vapour permeability and absorption*

ISO 17700, *Footwear — Test methods for upper components and insoles — Colour fastness to rubbing and bleeding*

ISO 17701, *Footwear — Test methods for uppers, lining and insoles — Colour migration*

ISO 17702, *Footwear — Test methods for uppers — Water resistance*

ISO 17704, *Footwear — Test methods for uppers, linings and insoles — Abrasion resistance*

ISO 17706, *Footwear — Test methods for uppers — Tensile strength and elongation*

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

ISO 19952, *Footwear — Vocabulary*

ISO 20870, *Footwear — Ageing conditioning*

ISO 80000-1, *Quantities and units — Part 1: General*

EN 1392, *Adhesives for leather and footwear materials — Solvent-based and dispersion adhesives — Testing of bond strength under specified conditions*

EN 15307, *Adhesives for leather and footwear materials — Sole-upper bonds — Minimum strength requirements*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 19952 apply.

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

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

4 Classification

The footwear shall be classified according to [Table 1](#).

Table 1 — Classification

Class	Exposure	Shoe type
A	slight	infant shoes, slippers, indoor shoes, fashion shoes
B	medium	casual shoes (adult and children shoes)
C	high	children school shoes, adult work shoes (not PPE) and general sport shoes
D	heavy	heavy work shoes (not PPE), trekking, hiking or similar purpose sports shoes

5 Requirements

5.1 General

This document establishes two different types of performance requirements.

The essential requirements shall all be fulfilled. Additional requirements can be agreed upon by the component supplier and the footwear manufacturer as indicated in [5.2.2](#) and [5.3.2](#).

The results of each determination, as well as the average values, shall be rounded off in accordance with ISO 80000-1.

When taken from finished footwear, the sample shall be prepared in accordance with ISO 17709.

5.2 Performance requirements for uppers components for footwear class A

5.2.1 Essential requirements

The essential requirements in [Table 2](#) shall be fulfilled in all cases.

Table 2 — Test methods and properties for uppers components for footwear class A — Essential requirements

Test method	Property	Requirements
ISO 17694	Flex resistance	Dry: 15 000 cycles without visible damage
ISO 17696	Tear strength	Average tear force ≥ 15 N
ISO 17700	Colour fastness	Inside staining: If unlined footwear, shall be ≥ 3 (grey scale) after 20 cycles with perspiration solution or after 50 cycles wet. For velour, nubuck and suede materials $\geq 2/3$ (grey scale). Outside surface: Staining: ≥ 3 (grey scale) after 100 cycles dry. Change in colour: ≥ 3 (grey scale) after 100 cycles dry and 20 cycles wet. For velour, nubuck and suede materials $\geq 2/3$ (grey scale).

5.2.2 Additional requirements

The additional requirements in [Table 3](#) should be agreed upon by both component supplier and footwear manufacturer.

Table 3 — Test methods and properties for uppers components for footwear class A — Additional requirements

Test method	Property	Requirements
ISO 17693	Lastability ^a	These figures are influenced by the shape of the footwear $\geq 7,0$ mm (for leather grain crack) $\geq 6,0$ mm (for other materials first damage)
ISO 17697	Seam strength	≥ 3 N/mm (method A)
EN 15307 EN 1392	Bondability ^{b, c}	$\geq 2,5$ N/mm
ISO 17701	Colour migration	24 h, colour change and staining ≥ 4 (grey scale)
ISO 17698	Delamination resistance	Full-grain leather: — Dry: $\geq 0,3$ N/mm — Wet: $\geq 0,2$ N/mm Patent leather: — Dry: $\geq 0,5$ N/mm — Wet: $\geq 0,3$ N/mm Other materials: — Dry: $\geq 0,3$ N/mm — Wet: $\geq 0,2$ N/mm
^a This test method is only applicable for component before lasting. ^b Reference adhesives and reference material shall comply with EN 15307. ^c The dimensions and number of test pieces for this test method shall be those included in ISO 17709.		

5.3 Performance requirements for uppers components for footwear class B, C and D

5.3.1 Essential requirements

The essential requirements in [Table 4](#) shall be fulfilled in all cases.

Table 4 — Test methods and properties for uppers components for footwear classes B, C and D — Essential requirements

Test method	Property	Requirements	
		Class B	Classes C, D
ISO 17694	Flex resistance	For leather: — Dry: 50 000 cycles ^a — Wet: 10 000 cycles ^a	
		For coated leather: — Dry: 100 000 cycles ^a — Wet: 20 000 cycles ^a	For coated leather: — Dry: 150 000 cycles ^a — Wet: 30 000 cycles ^a
		For PU coated leather: Humidity aging analogous ISO 20870, 7 days / 70 °C ± 2 °C / ≈ 95 % r.h. (= saturated water vapour atmosphere) at – 5 °C, 20 000 cycles ^a It is possible to select the temperature free for special shoes.	
		For other materials: Dry: 100 000 cycles ^a	For other materials: Dry: 150 000 cycles ^a
		For other materials: at – 5 °C, 50 000 cycles ^a It is possible to select the temperature free for special shoes.	
ISO 17696	Tear strength	Average tear force ≥ 25 N	Average tear force ≥ 30 N
ISO 17700	Colour fastness	Inside staining: If unlined footwear, shall be ≥ 3 (grey scale) after 20 cycles with perspiration solution or after 50 cycles wet. For velour, nubuck and suede materials ≥ 2/3 (grey scale). Outside surface colour change and staining: Change in colour: ≥ 3 (grey scale) after 150 cycles dry and 50 cycles wet. Staining: ≥ 3 (grey scale) after 10 cycles dry. For velour, nubuck and suede materials ≥ 2/3 (grey scale).	
^a Without visible damage.			

5.3.2 Additional requirements

The additional requirements in [Table 5](#) should be agreed upon by both component supplier and footwear manufacturer.

Table 5 — Test methods and properties for uppers components for footwear classes B, C and D — Additional requirements

Test method	Property	Requirements	
		Class B	Classes C, D
ISO 17693	Lastability ^a	These figures are influenced by the shape of the footwear ≥ 7,0 mm (for leather grain crack) ≥ 6,0 mm (for other materials first damage)	
ISO 17697	Seam strength	≥ 7,0 N/mm (method A)	
EN 15307 EN 1392	Bondability ^{b, c}	≥ 4,0 N/mm, or ≥ 3,0 N/mm, if material breakage occurs.	≥ 5,0 N/mm, or ≥ 3,5 N/mm, if material breakage occurs.
ISO 17699	Water vapour permeability (WVP) and water vapour absorption (WVA)	WVP ≥ 0,8 mg/cm ² ·h If WVP < 2,0 mg/cm ² ·h, then WVA ≥ 8,0 mg/cm ²	
ISO 17701	Colour migration	24 h, colour change and staining ≥ 4 (grey scale)	
ISO 17702	Water resistance	Depending on shoe type: Penetration time ≥ 60 min, absorption after 60 min ≤ 20 % (water resistant) Penetration time ≥ 180 min, absorption after 180 min ≤ 25 % (highly water resistant)	
ISO 17704	Abrasion resistance	No worse than moderate abrasion after: Dry: 25 600 cycles Wet: 12 800 cycles	No worse than moderate abrasion after: Dry: 51 200 cycles Wet: 25 600 cycles
		Evaluation scale of abrasion: No change; slight abrasion; moderate abrasion; severe abrasion; hole/breakage	
ISO 17706 ISO 3376 (leather)	Breaking strength and elongation	Non-leather upper: ≥ 10 N/mm, elongation ≥ 15 % (across) and ≥ 7 % (along) Leather upper: ≥ 15 N/mm ² , elongation ≥ 40 % (across and along)	
ISO 17698	Delamination resistance	Full-grain leather: — Dry: ≥ 0,3 N/mm — Wet: ≥ 0,2 N/mm Other materials: — Dry: ≥ 0,8 N/mm — Wet: ≥ 0,8 N/mm	Full-grain leather: — Dry ≥ 0,3 N/mm — Wet ≥ 0,2 N/mm for other materials: — Dry ≥ 1,2 N/mm — Wet ≥ 1,2 N/mm
^a This test method is only applicable for component before lasting. ^b Reference adhesives and reference material shall comply with EN 15307. ^c The dimensions and number of test pieces for this test method shall be those included in ISO 17709.			

6 Marking and labelling

Marking and labelling are optional.

If reference to this document is made, only uppers complying with all the essential requirements may be marked. In this case, this shall be clearly marked by the manufacturer either directly on the product or by a label with the following additional information:

- the manufacturer's name, trade mark or identification mark;
- the type of footwear for which the upper is intended to be used, as indicated in [Table 1](#);
- reference to this document;