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Footwear — Performance requirements for components for footwear — Outsoles

Chaussures — Exigences de performance pour les composants des chaussures — Semelles d'usure

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ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

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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 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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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 — Outsoles

1 Scope

This document establishes the performance requirements for outsole components for footwear, 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 outsoles for all kinds of footwear as defined in Table 1.

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 17707, *Footwear — Test methods for outsoles — Flex resistance*

ISO 17708, *Footwear — Test methods for whole shoe — Upper sole adhesion*

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

ISO 19952, *Footwear — Vocabulary*

ISO 20865, *Footwear — Test methods for outsoles — Compression energy*

ISO 20871, *Footwear — Test methods for outsoles — Abrasion resistance*

ISO 20872, *Footwear — Test methods for outsoles — Tear strength*

ISO 20873, *Footwear — Test methods for outsoles — Dimensional stability*

ISO 20874, *Footwear — Test methods for outsoles — Needle tear strength*

ISO 20875, *Footwear — Test methods for outsoles — Determination of split tear strength and delamination resistance*

ISO 22654, *Footwear — Test methods for outsoles — Tensile strength and elongation*

ISO 24267, *Footwear — Determination of coefficient of friction for footwear and sole components — Test method*

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

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.

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 outsoles for footwear

The essential and additional performance requirements are shown in Table 2. The essential requirements shall be fulfilled in all cases.

Table 2 — Test methods and requirements

Test method		Test name	Requirements			
			Class A	Class B	Class C	Class D
Essential	ISO 17707	Flexing resistance	cut growth ≤ 12 mm, and no spontaneous crack	cut growth ≤ 10 mm, and no spontaneous crack		cut growth ≤ 6 mm, and no spontaneous crack
	ISO 20875	Delamination resistance or split tear[a]	> 0,9 g/cm³ ≥ 3,0 N/mm ≤ 0,9 g/cm³ ≥ 1,7 N/mm			
	ISO 20871	Abrasion resistance	> 0,9 g/cm³ → ≤ 400 mm³ ≤ 0,9 g/cm³ → ≤ 300 mg	> 0,9 g/cm³ → ≤ 350 mm³ ≤ 0,9 g/cm³ → ≤ 250 mg	> 0,9 g/cm³ → ≤ 200 mm³ ≤ 0,9 g/cm³ → ≤ 150 mg	> 0,9 g/cm³ → ≤ 100 mm³ ≤ 0,9 g/cm³ → ≤ 100 mg
	ISO 20873	Dimensional stability	≤ 2,5 %			
	ISO 20874	Needle tear[b]	≥ 20 N/mm	≥ 30 N/mm	≥ 40 N/mm	
	ISO 20872	Tear strength	> 0,9 g/cm³ → ≥ 5,0 N/mm ≤ 0,9 g/cm³ → ≥ 3,0 N/mm	> 0,9 g/cm³ → ≥ 7,0 N/mm ≤ 0,9 g/cm³ → ≥ 4,0 N/mm	> 0,9 g/cm³ → ≥ 9,0 N/mm ≤ 0,9 g/cm³ → ≥ 5,0 N/mm	
	ISO 22654	Tensile strength	> 0,9 g/cm³ → ≥ 3,5 N/mm² ≤ 0,9 g/cm³ → ≥ 2,0 N/mm²	> 0,9 g/cm³ → ≥ 4,0 N/mm² ≤ 0,9 g/cm³ → ≥ 3,0 N/mm²	> 0,9 g/cm³ → ≥ 5,0 N/mm² ≤ 0,9 g/cm³ → ≥ 4,0 N/mm²	> 0,9 g/cm³ → ≥ 10,0 N/mm² ≤ 0,9 g/cm³ → ≥ 5,0 N/mm²
	ISO 22654	Elongation at break	> 0,9 g/cm³ → ≥ 300 % ≤ 0,9 g/cm³ → ≥ 250 %	> 0,9 g/cm³ → ≥ 300 % ≤ 0,9 g/cm³ → ≥ 250 %	> 0,9 g/cm³ → ≥ 400 % ≤ 0,9 g/cm³ → ≥ 300 %	> 0,9 g/cm³ → ≥ 450 % ≤ 0,9 g/cm³ → ≥ 350 %
Additional	ISO 24267	Slip resistance[c,e]	Ceramic Eurotile / water CoF: — Foreward heel slip: ≥ 0,28 — Foreward flat slip: ≥ 0,30[d] — Backward forepart slip: ≥ 0,30[d]			
	ISO 20865	Compression energy[c,e]	≥ 15 J			
	ISO 17708	Bondability[c]	≥ 2,5 N/mm	≥ 3,0 N/mm (≥ 2,5 N/mm at material failure)	≥ 3,5 N/mm (≥ 3,0 N/mm at material failure)	≥ 5,0 N/mm (≥ 3,5 N/mm at material failure)

[a] Only applicable for multilayer outsoles.

[b] Only applicable for outsoles for sewn footwear.

[c] Only applicable for finished footwear.

[d] Only one of the two requirements (flat or forepart) shall comply.

[e] Only applicable in footwear which claim this type of added value properties.

6 Marking and labelling

Marking and labelling are optional.

If a reference to this document is done, only outsoles 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:

a) the manufacturer's name, trade mark or identification mark;

b) the class of footwear for which the outsole is intended to be used, as indicated in Table 1;

c) reference to this document.

Any reference to compliance with this document shall not be put in a part of the outsole that can be visible when the footwear is finished.