TECHNICAL REPORT

ISO/TR 20881

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Footwear — Performance requirements for components for footwear — Insoles

Chaussures — Exigences de performance pour les composants des chaussures — Premières de montage

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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.

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.

In exceptional circumstances, when a technical committee has collected data of a different kind from that which is normally published as an International Standard ("state of the art", for example), it may decide by a simple majority vote of its participating members to publish a Technical Report. A Technical Report is entirely informative in nature and does not have to be reviewed until the data it provides are considered to be no longer valid or useful.

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/TR 20881 was prepared by the European Committee for Standardization (CEN) Technical Committee CEN/TC 309, *Footwear*, in collaboration with Technical Committee ISO/TC 216, *Footwear*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

Footwear — Performance requirements for components for footwear — Insoles

1 Scope

This Technical Report establishes the performance requirements for insoles components for footwear (not for the finished footwear), irrespective of the material, in order to assess the suitability for the end use and/or fitness for purpose. It also establishes the test methods to be used to evaluate the compliance with the requirements.

This Technical Report applies to insoles for all kinds of footwear as defined in Clause 3.

This Technical Report is intended to be used as a reference between the manufacturer and the supplier. It is not intended for third party certification.

2 Normative references

The following referenced documents are indispensable for the application 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 31-0, *Quantities and units — Part 0: General principles*

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

EN ISO 19952, *Footwear — Vocabulary*

ISO 20866, *Footwear — Test methods for insoles — Delamination resistance*

ISO 20867, *Footwear — Test methods for insoles — Heel pin holding strength*

ISO 20868, *Footwear — Test methods for insoles — Abrasion resistance*

ISO 20869, *Footwear — Test methods for outsoles, insoles, lining and insocks — Water soluble content*

ISO 20876, *Footwear — Test methods for insoles — Resistance to stitch tear*

ISO 22649, *Footwear — Test methods for insoles and insocks — Water absorption and desorption*

ISO 22651, *Footwear — Test methods for insoles — Dimensional stability*

3 Terms and definitions

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

4 Requirements

4.1 General

This Technical Report establishes two different types of performance requirement.

The essential requirements shall be taken all into account. The additional ones can be additionally agreed by the component supplier and the footwear manufacturer as indicated in 4.2 to 4.10.

The results of each single analytical determination, as well as the average values, shall be rounded off in accordance with ISO 31-0.

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

4.2 Performance requirements for insole components for general-purpose sports footwear

4.2.1 Essential requirements

These essential requirements shall be fulfilled in all cases. See Table 1.

Table 1 — Test methods and properties for general sports footwear — Essential requirements

Test method	Property	Requirement
ISO 20869	Water soluble substances content	⩽ 1,5 % sulfated ashed water soluble (SAWS) ⩽ 16 % total water soluble (TWS)
ISO 20866	Delamination resistance	(Only for non-leather components) Fore part: ⩾ 700 kPa dry; ⩾ 650 kPa wet Seat part: ⩾ 600 kPa dry; ⩾ 450 kPa wet
ISO 20868	Abrasion resistance	No surface tearing before 400 cycles (testing not necessary if full sock is used)
ISO 20876	Resistance to stich tear	⩾ 140 N This requirement is only applicable for sewn insoles.

4.2.2 Additional requirements

These additional requirements should be agreed by both component supplier and footwear manufacturer. See Table 2.

Table 2 — Test methods and properties for general sports footwear — Additional requirements

Subclause	Test method	Property	Requirement
4.2.2.1	ISO 22651	Dimensional stability	increase in size ⩽ 2,0 % shrinkage ⩽ 2,0 %
4.2.2.2	ISO 22649	Water absorption and desorption	(method B) absorption ⩾ 70 mg/cm^2 desorption ⩾ 60 %

4.3 Performance requirements for insole components for school footwear

4.3.1 Essential requirements

These essential requirements shall be fulfilled in all cases. See Table 3.

Table 3 — Test methods and properties for school footwear — Essential requirements

Test method	Property	Requirement
ISO 20869	Water soluble substances content	⩽ 1,5 % sulfated ashed water soluble (SAWS) ⩽ 16 % total water soluble (TWS)
ISO 20866	Delamination resistance	(Only for non-leather components) Fore part: ⩾ 700 kPa dry; ⩾ 650 kPa wet Seat part: ⩾ 600 kPa dry; ⩾ 450 kPa wet
ISO 20867	Heel pin holding strength	⩾ 700 N dry ⩾ 600 N wet (if it applies)
ISO 20876	Resistance to stich tear	⩾ 140 N This requirement is only applicable for sewn insoles.

4.3.2 Additional requirements

These additional requirements should be agreed by both component supplier and footwear manufacturer. See Table 4.

Table 4 — Test methods and properties for school footwear — Additional requirements

Subclause	Test method	Property	Requirement
4.3.2.1	ISO 20868	Abrasion resistance	No surface tearing before 400 cycles (testing not necessary if full sock is used)
4.3.2.2	ISO 22651	Dimensional stability	increase in size ⩽ 2,0 % shrinkage ⩽ 2,0 %
4.3.2.3	ISO 22649	Water absorption and desorption	(method B) absorption ⩾ 70 mg/cm^2 desorption ⩾ 60 %

4.4 Performance requirements for insole components for casual footwear

4.4.1 Essential requirements

These essential requirements shall be fulfilled in all cases. See Table 5.

Table 5 — Test methods and properties for casual footwear — Essential requirements

Test method	Property	Requirement
ISO 20869	Water soluble substances content	⩽ 1,5 % sulfated ashed water soluble (SAWS) ⩽ 16 % total water soluble (TWS)
ISO 20866	Delamination resistance	(Only for non-leather components) Fore part: ⩾ 650 kPa dry; ⩾ 550 kPa wet Seat part: ⩾ 600 kPa dry; ⩾ 450 kPa wet
ISO 20867	Heel pin holding strength	⩾ 700 N dry ⩾ 600 N wet (if it applies)
ISO 20868	Abrasion resistance	No surface tearing before 400 cycles (testing not necessary if full sock is used)
ISO 20876	Resistance to stich tear	⩾ 140 N This requirement is only applicable for sewn insoles.

4.4.2 Additional requirements

These additional requirements should be agreed by both component supplier and footwear manufacturer. See Table 6.

Table 6 — Test methods and properties for casual footwear — Additional requirements

Subclause	Test method	Property	Requirement
4.4.2.1	ISO 22651	Dimensional stability	increase in size ⩽ 2,0 % shrinkage ⩽ 2,0 %
4.4.2.2	ISO 22649	Water absorption and desorption	(method B) absorption ⩾ 70 mg/cm^2 desorption ⩾ 60 %

4.5 Performance requirements for insole components for men's town footwear

4.5.1 Essential requirements

These essential requirements shall be fulfilled in all cases. See Table 7.

Table 7 — Test methods and properties for men's town footwear — Essential requirements

Test method	Property	Requirement
ISO 20868	Water soluble substances content	⩽ 1,5 % sulfated ashed water soluble (SAWS) ⩽ 16 % total water soluble (TWS)
ISO 22651	Dimensional stability	increase in size ⩽ 2,0 % shrinkage ⩽ 2,0 %
ISO 20876	Resistance to stich tear	⩾ 100 N This requirement is only applicable for sewn insoles.
ISO 20867	Heel pin holding strength	⩾ 700 N dry ⩾ 600 N wet (if it applies)

4.5.2 Additional requirements

These additional requirements should be agreed by both component supplier and footwear manufacturer. See Table 8.

Table 8 — Test methods and properties for men's town footwear — Additional requirements

Subclause	Test method	Property	Requirement
4.5.2.1	ISO 20866	Delamination resistance	(Only for non-leather components) Fore part: ⩾ 500 kPa dry; ⩾ 300 kPa wet Seat part: ⩾ 500 kPa dry; ⩾ 300 kPa wet
4.5.2.2	ISO 20868	Abrasion resistance	No surface tearing before 300 cycles (testing not necessary if full sock is used)
4.5.2.3	ISO 22649	Water absorption and desorption	(method B) absorption ⩾ 60 mg/cm^2 desorption ⩾ 60 %

4.6 Performance requirements for insole components for cold weather footwear

4.6.1 Essential requirements

These essential requirements shall be fulfilled in all cases. See Table 9.

Table 9 — Test methods and properties for cold weather footwear — Essential requirements

Test method	Property	Requirement
ISO 20869	Water soluble substances content	⩽ 1,5 % sulfated ashed water soluble (SAWS) ⩽ 16 % total water soluble (TWS)
ISO 20866	Delamination resistance	(Only for non-leather components) Fore part: ⩾ 700 kPa dry; ⩾ 650 kPa wet Seat part: ⩾ 600 kPa dry; ⩾ 450 kPa wet
ISO 20868	Abrasion resistance	No surface tearing before 400 cycles (testing not necessary if full sock is used)
ISO 20867	Heel pin holding strength	⩾ 700 N dry ⩾ 600 N wet (if it applies)
ISO 20876	Resistance to stich tear	⩾ 140 N This requirement is only applicable for sewn insoles.

4.6.2 Additional requirements

These additional requirements should be agreed by both component supplier and footwear manufacturer. See Table 10.

Table 10 — Test methods and properties for cold weather footwear — Additional requirements

Subclause	Test method	Property	Requirement
4.6.2.1	ISO 22651	Dimensional stability	increase in size ⩽ 2,0 % shrinkage ⩽ 2,0 %
4.6.2.2	ISO 22649	Water absorption and desorption	(method B) absorption ⩾ 70 mg/cm^2 desorption ⩾ 60 %

4.7 Performance requirements for insole components for women's town footwear

4.7.1 Essential requirements

These essential requirements shall be fulfilled in all cases. See Table 11.

Table 11 — Test methods and properties for women's town footwear — Essential requirements

Test method	Property	Requirement
ISO 20869	Water soluble substances content	⩽ 1,5 % sulfated ashed water soluble (SAWS) ⩽ 16 % total water soluble (TWS)
ISO 22651	Dimensional stability	increase in size ⩽ 2,0 % shrinkage ⩽ 2,0 %
ISO 20867	Heel pin holding strength	Heel height, measured vertically at back less than 50 mm ⩾ 700 N dry ⩾ 600 N wet 50 mm to 74 mm ⩾ 900 N dry ⩾ 800 N wet 75 mm to 99 mm ⩾ 1 100 N dry ⩾ 1 000 N wet 100 mm and over ⩾ 1 300 N dry ⩾ 1 200 N wet
ISO 20876	Resistance to stich tear	⩾ 100 N This requirement is only applicable for sewn insoles.

4.7.2 Additional requirements

These additional requirements should be agreed by both component supplier and footwear manufacturer. See Table 12.

Table 12 — Test methods and properties for women's town footwear — Additional requirements

Subclause	Test method	Property	Requirement
4.7.2.1	ISO 20866	Delamination resistance	(Only for non-leather components) Fore part: ⩾ 500 kPa dry; ⩾ 300 kPa wet Seat part: ⩾ 500 kPa dry; ⩾ 300 kPa wet
4.7.2.2	ISO 20868	Abrasion resistance	No surface tearing before 300 cycles (testing not necessary if full sock is used)
4.7.2.3	ISO 22649	Water absorption and desorption	(method B) absorption ⩾ 60 mg/cm^2 desorption ⩾ 60 %

4.8 Performance requirements for insole components for fashion footwear

4.8.1 Essential requirements

These essential requirements shall be fulfilled in all cases. See Table 13.

Table 13 — Test methods and properties for fashion footwear — Essential requirements

Test method	Property	Requirement
ISO 20869	Water soluble substances content	⩽ 1,5 % sulfated ashed water soluble (SAWS) ⩽ 16 % total water soluble (TWS)
ISO 20866	Delamination resistance	(Only for non-leather components) Fore part: ⩾ 300 kPa dry; ⩾ 150 kPa wet Seat part: ⩾ 300 kPa dry; ⩾ 150 KPa wet
ISO 20867	Heel pin holding strength	Heel height, measured vertically at back less than 50 mm ⩾ 700 N dry ⩾ 600 N wet 50 mm to 74 mm ⩾ 900 N dry ⩾ 800 N wet 75 mm to 99 mm ⩾ 1 100 N dry ⩾ 1 000 N wet 100 mm and over ⩾ 1 300 N dry ⩾ 1 200 N wet
ISO 20876	Resistance to stich tear	⩾ 80 N This requirement is only applicable for sewn insoles.

4.8.2 Additional requirements

These additional requirements should be agreed by both component supplier and footwear manufacturer. See Table 14.

Table 14 — Test methods and properties for fashion footwear — Additional requirements

Subclause	Test method	Property	Requirement
4.8.2.1	ISO 22649	Water absorption and desorption	(method B) absorption ⩾ 60 mg/cm^2 desorption ⩾ 60 %
4.8.2.2	ISO 20868	Abrasion resistance	No surface tearing before 200 cycles (testing not necessary if full sock is used)
4.8.2.3	ISO 22651	Dimensional stability	Increase in size ⩽ 2,0 % shrinkage ⩽ 2,0 %