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## Footwear — Determination of coefficient of friction for footwear and sole components — Test method

*Chaussures — Détermination du coefficient de frottement pour les  
chaussures et éléments de semelle — Méthode d'essai*

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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 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](http://www.iso.org/directives)).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see [www.iso.org/patents](http://www.iso.org/patents)).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

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](http://www.iso.org/iso/foreword.html).

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

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](http://www.iso.org/members.html).



# Footwear — Determination of coefficient of friction for footwear and sole components — Test method

## 1 Scope

This document provides a method for determining the coefficient of friction between footwear and floorings under conditions simulating those experienced in the phases of a typical walking step when slip is most likely to occur.

The method is applicable to all types of footwear and footwear components, outsole units, heel top pieces (top lifts) and sheet soling materials, excepting PPE footwear (Personal Protective Equipment) and special purpose footwear containing spikes, metal studs or similar.

## 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 13287:2019, *Personal protective equipment — Footwear — Test method for slip resistance*

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 13287:2019 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/>

## 4 Principle

The footwear item and underfoot surface are brought into contact, subjected to a specified vertical force for a short period of static contact then moved horizontally relative to one another at a constant speed. The horizontal frictional force is measured at a given time after movement starts and the dynamic coefficient of friction is calculated for the particular conditions of the test.

## 5 Apparatus and materials

Use apparatus and materials in ISO 13287:2019, Clause 4.

NOTE Regarding standard shoemaking last in ISO 13287:2019, 4.1.1, other lasts with the same dimensions of STM603L<sup>TM1)</sup> lasts can also be used.

Additional materials/accessories to test samples according to 8.1 to 8.6:

**5.1** Cellulosic insole material of around 2 mm in thickness for testing soles which are going to be used in the footwear with an insole (for testing according to 8.2 to 8.6).

1) STM603L<sup>TM</sup> is the trade name of a product supplied by SATRA (<https://www.satra.com/>). This information is given for the convenience of users of this document and does not constitute an endorsement by ISO of the product named. Equivalent products may be used if they can be shown to lead to the same results.



**5.2** Means to secure the soles to the last, as mechanical means, double sided adhesive tape, seal, adhesives, bands, etc. (for testing according to [8.2](#) to [8.6](#)).

**5.3** Saw and/or sanding machine, for sample preparation (for testing according to [8.3](#) and [8.4](#)).

**5.4** Mechanical systems to attach to the equipment spigot small-sized top-pieces, bigger top pieces, Slider 96<sup>TM2</sup>) test piece or other testing samples to the testing machine, that can be used to replace the shoemaking lasts or mechanical foots (for testing according to [8.5](#)).

**5.5** High-hardness rubber material of at least 50 mm × 50 mm (thickness of ≤2 mm), for small- sized top piece testing (for testing according to [8.5](#)).

**5.6** Metallic plate made of e. g. aluminium, of at least 180 mm × 80 mm and 2,5 mm thick, for sheet material testing (for testing according to [8.6](#)).

## 6 Sampling and conditioning

### 6.1 Sampling

Two samples shall be tested, right foot and left foot whenever possible, with the exception of top pieces where 2 test pieces shall be tested and sheet material where 2 test pieces shall be tested per direction.

### 6.2 Conditioning

The test items shall be conditioned prior to the test at 23 °C ± 2 °C and 50 % ± 5 % HR (Relative Humidity) for a minimum of 24 h. If necessary, the sample may be removed from this standard atmosphere, provided that its temperature is maintained at 23 °C ± 2 °C, that testing starts within 30 min after removal from this standard atmosphere and that the testing is carried out at 23 °C ± 2 °C.

## 7 Preparation of sample and floor

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All footwear test specimens shall be tested in the new condition so as to take account of the surface finish.

Use method described in ISO 13287:2019, Clause 7, for preparation of samples and floor prior to testing.

Worn footwear may be tested in the condition in which they are received.

It is possible to evaluate the friction after simulating real wear by ageing the footwear. In this case, the ageing method shall be reported with CoF (Coefficient of Friction) results of aged sample.

Prior to testing, condition test specimens according to [6.2](#).

## 8 Test method

### 8.1 Test modes and test conditions for footwear with low heel seat height

Test modes and conditions shall be those of ISO 13287:2019, excepting for children footwear, size below 34, in which a vertical force of 250 N instead of 400 N will be used

Common contaminant conditions for daily footwear may be the following:

— Detergent solution according to ISO 13287:2019, 4.12.

2) Slider 96<sup>TM</sup> is the trade name of a product supplied by Smithers Rapra (<https://www.smithers.com/home>). This information is given for the convenience of users of this document and does not constitute an endorsement by ISO of the product named. Equivalent products may be used if they can be shown to lead to the same results.