SLOVENSKI STANDARD
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Trenje - Preskusne metode za vsakdanjo obutev in sestavne dele (ISO/DIS 24267:2019)

Friction - Test methods for casual footwear and components (ISO/DIS 24267:2019)

Reibung - Prüfverfahren für Schuhe für den täglichen Gebrauch und Schuhbestandteile (ISO/DIS 24267:2019)

Frottement - Méthodes d'essai pour les chaussures de loisirs et leurs composants (ISO/DIS 24267:2019)

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Foreword

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

Friction — Test methods for casual footwear and components

1 Scope

This method determines 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, excepting professional footwear (EPI), outsole units, heel top pieces (top lifts) and sheet soling materials.

2 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.

3 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, *Personal protective equipment — Footwear — Test method for slip resistance*

4 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

4.1
normal force
force applied to the surface through the footwear, perpendicular (90°) to the surface. The force includes the weight of the footwear, shoemaking last (4.1.1 or 4.1.2) or mechanical foot (4.1.3) and mounting

4.2
frictional force
force parallel to the surface and against the direction of movement arising when footwear slides over a surface

4.3
coefficient of friction CoF
ratio of the frictional force divided by the normal force

4.4
static contact time
time between initial contact of the footwear with the surface achieving a normal force of 50 N and the beginning of movement

4.5
measurement period
time interval during which the frictional force measurement is taken and during which the test conditions are satisfied

4.6
floor
material (flooring), without contaminant (lubricant), to be used as the test surface

4.7
surface
floor, with or without contaminant (lubricant), against which the footwear is tested

4.8
calibration test value CTV
coefficient of friction between the Slider 96 and the test surface

5 Apparatus and materials

Use apparatus and materials referred to in ISO 13287:2019, Chapter 4, with the following exceptions:

- Regarding standard shoemaking last, other lasts with the same dimensions of "STM603L lasts[1)]" can also be used.
- Regarding test flooring surface, preferably use pressed ceramic tile, or the flooring called up in the relevant performance requirements. Suitable surfaces include EUROTILE 2 referred to in Annex B of ISO 13287:2019, other quarry tiles, vinyl, carpet or wood.

Additional materials/accessories needed to test samples according to 7.1 to 7.6:

- 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 7.1).
- Means to secure the soles to the last, as mechanical means, double sided adhesive tape, seal, adhesives, bands, etc. (for testing according to 7.1).
- Saw and/or sanding machine, for sample preparation (for testing according to 7.3).
- Mechanical systems to attach to the equipment spigot small-sized top-pieces, bigger top pieces, Slider 96 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 7.5).
- 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 7.5).
- Metallic plate made of e. g. aluminium, of at least (180 × 80) mm and 2,5 mm thick, for sheet material testing (for testing according to 7.6).

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 ± 2) °C and (50 ± 5) % RH 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 ± 2) °C, that testing starts within 30 min after removal from this standard atmosphere and that the testing is carried out at (23 ± 2) °C.

1) Estándar lasts supplied by SATRA.

7 Test method

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

Test modes and conditions are those of EN ISO 13287.

Common contaminant conditions for daily footwear may be the following:

- Detergent solution according to ISO 13287:2019.
- Glycerol solution according to ISO 13287:2019.
- Water.
- Dry conditions (without contaminant).

7.2 Test modes and test conditions for unit soles

- Attach a 2 mm thick sheet of cellulosic material to the outsole simulating an insole. In special cases as "bio" soles (anatomical shape), that do not have an insole, do the test without the cellulosic material.
- Secure the mechanical foot firmly for the flat test mode, or secure the last for the heel or forepart test mode, using double sided adhesive tape or other mechanical means that do not affect the testing surface. The forepart area of the outsole shall always match the forefoot area of the last (see Figure 1 for the particular case of testing soles in flat mode with artificial foot).
- In the heel test mode, avoid separation between the waist area of the sole and the waist area of the last over sliding, since the heel may be dragged backwards and flattened. Should this occur, use laces, adhesive tape or any other mechanical method to fasten the outsole and last waist areas together.
- Where the feather edge is not visible on the outsole and the position of the last upon the outsole (this information shall be provided by the test orderer) is unknown, place the last at 10 mm from the rear or front edge of the outsole, thus leaving the estimated space that the upper may fill.
- When the outsole matches several sizes, place the size of the last that best suits the outsole length following the indications in the previous paragraph, and report the last size used.
- Once the sample is ready, carry out the test according to the normal procedure described in chapter 7.1, using the vertical force according to the sample size.
- Is soles are those used in high heeled footwear, flat and heel mode can not be carried out.

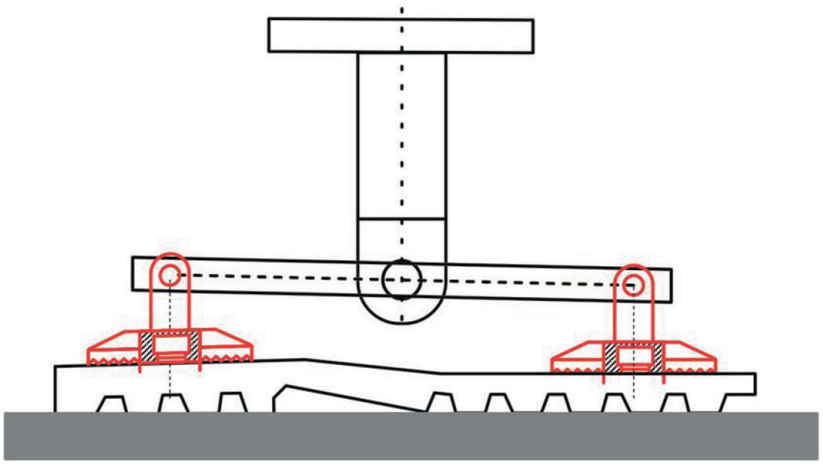

Figure 1 — Testing soles in flat mode with artificial foot

7.3 Footwear or soles with heel and forepart moulded in one piece type 1

In this footwear o sole there is full contact with the floor in the waist area. See Figure 2.

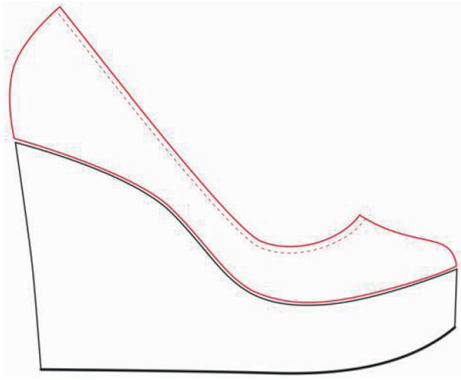

Figure 2 — Footwear o sole type 1

7.3.1 Samples with heel seat height lower than 80 mm

- Carry out the test in flat mode conventionally with the mechanical foot, provided that it can be fitted. In these cases, the verticality of the central axis of the mechanical foot is lost, to a greater or lesser extent, depending on the heel elevation of the footwear. See Figure 3.
- For the heel and forepart test modes, flatten the outsole by removing all of the heel elevation, by means of some machining method and proceed with the tests normally with the shoemaking last.
- When the footwear features a removable top piece, it may be removed carefully so as not to cause any damage and tested individually according to the procedure described for the test on top pieces (7.5).
- If samples are soles to be used in footwear with insole, carry out the tests with the 2-mm thick sheet of cellulosic material attached to the outsole simulating an insole, as described in 7.2.

7.3.2 Samples with heel seat height higher than 80 mm

- For the flat test mode, flatten the heel seat area of the outsole down to 80 mm, by means of some machining method and proceed with the test normally. To this end, when dealing with footwear, remove the upper to start with the process required. See Figure 4.
- For the heel and forepart test modes, flatten the outsole by removing all of the heel elevation, by means of some machining method and proceed with the tests normally with the shoemaking last.
- When the footwear features a removable top piece, it may be removed carefully so as not to cause any damage and tested individually according to the procedure described for the test on top pieces (7.5).
- If samples are soles to be used in footwear with insole, carry out the tests with the 2 mm thick sheet of cellulosic material attached to the outsole simulating an insole, as described in 7.2.

