



BSI Standards Publication

Footwear - Test methods for lining and insoles - Static friction

National foreword

This British Standard is the UK implementation of EN ISO 22653:2018. It is identical to ISO 22653:2003. It supersedes BS EN 12826:2000, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee TCI/69, Footwear & Leather.

A list of organizations represented on this committee can be obtained on request to its secretary.

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English Version

Footwear - Test methods for lining and insoles - Static friction (ISO 22653:2003)

Chaussures - Méthodes d'essai pour la doublure et pour la première de propreté - Frottement statique (ISO 22653:2003)

Schuhe - Prüfverfahren für Futter und Decksohlen - Haftreibung (ISO 22653:2003)

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European foreword

The text of ISO 22653:2003 has been prepared by Technical Committee ISO/TC 216 "Footwear" of the International Organization for Standardization (ISO) and has been taken over as EN ISO 22653:2018 by Technical Committee CEN/TC 309 "Footwear" the secretariat of which is held by UNE.

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Endorsement notice

The text of ISO 22653:2003 has been approved by CEN as EN ISO 22653:2018 without any modification.

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Foreword

This European Standard has been prepared by Technical Committee CEN/TC 309 "Footwear", the secretariat of which is held by AENOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by September 2000, and conflicting national standards shall be withdrawn at the latest by September 2000.

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1 Scope

This European standard specifies two methods of assessing the frictional properties of lining and insoles, irrespective of the material.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 12222, *Footwear – Standard atmospheres for conditioning and testing of footwear and components for footwear.*

3 Definitions

For the purposes of this standard the following definitions apply:

3.1

coefficient of static friction (μ_s)

the ratio of the force necessary to cause the tangential separation of two stationary surfaces to the perpendicular force acting upon the two surfaces

3.2

coefficient of kinetic friction (μ_k)

the ratio of the force necessary to maintain a constant velocity between two surfaces in contact to the perpendicular force acting upon the two surfaces

3.3

kinetic angle of surface drag (D_k)

the angle of the inclined plane at which the test sled will slide down the inclined plane when sliding is initiated by a standard impulse

3.4

static angle of surface drag (D_s)

the angle of the inclined plane at which the test sled will slide down the inclined plane under its own mass and momentum

4 Apparatus and material

The following apparatus and material shall be used:

4.1 Method A

4.1.1 A sled, (150 mm $\pm$ 1 mm) long x (100 mm $\pm$ 1 mm) wide having a mass of 700 g $\pm$ 15 g to which a lining or insole test specimen is attached (see 5.1.1) and a test specimen support of cellular rubber, or plastics material, 3 mm thick and of medium apparent density. The surface of the sled is flat and smooth or polished. The edges of the sled do not contain any burrs or roughness.

When laid upon the horizontal bed of the test instrument the sliding surface of the sled is parallel with the horizontal bed, in full planar contact and without distortion.

4.1.2 A driving mechanism, to move the sled or horizontal bed in such a manner that the relative movement of one with the other can be maintained at a constant velocity of 800 mm/min $\pm$ 80 mm/min.

The drive mechanism is automatically disengaged or de-energized at the end of the test run (see 4.1.3).

4.1.3 A flat bed of rigid construction, having a smooth or polished surface to which the comparator material (see 5.1.2) is fixed in such a manner that the comparator material is not stretched more than a necessary minimum to remove wrinkles or other non-permanent distortions.

The flat bed is of a length to permit a relative surface travel during the test of approximately 400 mm and of a width to permit approximately 50 mm of clearance between the edge of the sled and any edge obstructions.

4.1.4 A measuring device, in the form of a strain gauge, with an associated autographic recording instrument to determine accurately the force necessary to initiate movement and the force necessary to maintain a constant velocity thereafter. The response time of the recording instrument is less than 0,25 s.

4.2 Method B

4.2.1 Instrument for the determination of static angle of surface drag (D_s)

4.2.1.1 Rigid platform, not less than 300 mm long and not less than 100 mm wide and hinged at one end to a baseboard provided with levelling screws. The rigid platform shall be provided with a spirit level and means for measuring the angle of inclination with an accuracy of $\pm 0,5^\circ$.

4.2.1.2 A piece of woollen melton cloth¹⁾, measuring approximately 250 mm long and 100 mm wide with its length in the cross direction and fixed under slight tension to the platform (see 4.2.1.1)

NOTE The melton cloth should be covered when the apparatus is not in use. It should be replaced at intervals, or if contaminated.

4.2.1.3 Specimen carrier, made of metal, with dimensions as illustrated in figure 1. The total mass of the carrier including the clamping screw shall be adjusted to 300 g by balanced boring out of the upper section of the carrier.

¹⁾ Recommended physical characteristics of woven fabrics:

Fibre content:	90 % Wool, 10 % Cotton
Weave:	3/1 broken
Finish and other details:	woollen spun
Mass per unit area:	min. 650 g/m ²
Threads per unit length:	warp: min. 14,6 per cm, weft: min. 11,0 per cm
Breaking strength:	warp: min. 355 N per 50 mm, weft: min. 325 N per 50 mm
Dimensional change:	max. 2,0