SLOVENSKI STANDARD
oSIST prEN ISO 17700:2018

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Obutev - Preskusne metode za zgornje dele in notranje vložke - Barvna odpornost proti drgnjenju in puščanje barve (ISO/DIS 17700:2018)

Footwear - Test methods for upper components and insocks - Colour fastness to rubbing and bleeding (ISO/DIS 17700:2018)

Schuhe - Prüfverfahren für Obermaterialien, Futter und Decksohlen - Farbechtheit bei Abrieb (ISO/DIS 17700:2018)

Chaussures - Méthodes d'essai des composants de la tige et des premières de propreté - Solidité des coloris au frottement et à l'exsudation (ISO/DIS 17700:2018)

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Footwear — Test methods for upper components and insocks — Colour fastness to rubbing and bleeding

Chaussures — Méthodes d'essai des tiges, des doublures et des garnitures intérieures — Stabilité de la couleur frottement et lessivage

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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).

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).

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

For an explanation on 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 the following URL: www.iso.org/iso/foreword.html.

ISO 18454 was prepared by the European Committee Standardization (CEN) Technical Committee ISO/TC 216, *Footwear*, in collaboration with CEN/TC 309, *Footwear*, in accordance with the agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This second edition cancels and replaces the first edition (ISO 17700:2004) which has been technically revised.

Method A of this Standard is based on the IULTCS/IUF 450 method (ISO 11640:2012, Leather — Tests for colour fastness — Colour fastness to cycles of to-and-fro rubbing), methods B and D are based on the method EN 13516:2001 and EN 13516:2001/AC:2003 and method C is based on the IULTCS/IUF 452 method (ISO 20433:2012, Leather — Tests for colour fastness — Colour fastness to crocking) and on ISO 105-X12:2016, Textiles — Tests for colour fastness — Part X12: Colour fastness to rubbing.

Footwear — Test methods for upper components and insocks — Colour fastness to rubbing and bleeding

1 Scope

1.1 This standard specifies three test methods (method A, method B and method C) for assessing the degree of transfer of a material's surface colour during dry or wet rubbing. The methods are applicable to all footwear upper, lining and insock irrespective of the material, in order to assess the suitability for the end use.

1.2 This standard also specifies a method (method D) for determining the likelihood of colour bleeding from materials and components. The method is applicable to all footwear upper, lining and insock irrespective of the material as well as sewing threads and shoe laces due to the action of water and artificial perspiration solutions, in order to assess the suitability for the end use.

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 18454, *Footwear — Standard atmospheres for conditioning and testing of footwear and components for footwear*

ISO 105-A01, *Textiles — Tests for colour fastness — Part A01: General principles of testing*

ISO 105-A02, *Textiles — Tests for colour fastness — Part A02: Grey scale for assessing change in colour*

ISO 105-A03, *Textiles — Tests for colour fastness — Part A03: Grey scale for assessing staining*

ISO 105-E04, *Textiles — Tests for colour fastness — Part E04: Colour fastness to perspiration*

ISO 105-F09, *Textiles — Tests for colour fastness — Part F09: Specification for cotton rubbing cloth*

ISO 105-F10, *Textiles — Tests for colour fastness — Part F10: Specification for adjacent fabric: Multifibre*

ISO 3696, *Water for analytical laboratory use — Specification and test methods*

ISO 2418, *Leather — Chemical, physical and mechanical and fastness tests — Sampling location*

ISO 2419, *Leather — Physical and mechanical tests — Sample preparation and conditioning*

ISO 9073-2, *Textiles — Test methods for nonwovens — Part 2: Determination of thickness*

ISO 4045, *Leather — Chemical tests — Determination of pH and difference figure*

3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at http://www.iso.org/obp

3.1
colour fastness
ability of a footwear material or component to maintain its colour after the action of various agents

3.2
thick leather
leather with a thickness greater than 2 mm

4 Apparatus and material

The following apparatus and material shall be used:

4.1 Method A – Veslic machine

4.1.1 Test machine with the following:

4.1.1.1 Flat horizontal metal platform of minimum dimensions 80 mm × 25 mm.

4.1.1.2 Means of moving the platform in a direction parallel to its 80 mm edges through distance of 35 mm to 40 mm and back again at a rate of 40 cycles/min ± 2 cycles/min.

4.1.1.3 Pair of clamps positioned at the ends of the platform at 90° to the 80 mm edges and which are designed to clamp the test specimen against the platform. The clamp faces shall be a minimum distance of 80 mm apart.

4.1.1.4 Means of moving the clamps apart so that the test specimen is extended linearly by an amount adjustable up to 20 %.

4.1.1.5 Rubbing finger with a flat horizontal lower surface capable of holding a square felt pad (4.1.2). The depth of the cavity that holds the square felt pad should be 3,9 mm ± 0,1 mm. For machines with a platform wider than 25 mm the relative position of the rubbing finger shall be adjustable across the width of the platform.

4.1.1.6 Means of holding a square felt pad (4.1.2) on the lower surface of the finger.

4.1.1.7 Means of applying a downward force of 4,9 N ± 0,1 N or 9,8 N ± 0,2 N to the rubbing finger.

4.1.1.8 Means of counting the number of cycles traversed by the platform.

4.1.2 Square pads of white or black pure wool felt, with the following requirements:

4.1.2.1 Sides of length 15 mm ± 1 mm.

4.1.2.2 Mass per unit area: 1 900 g/m^2 ± 150 g/m^2.

4.1.2.3 Thickness 6,0 mm ± 0,5 mm when measured using a dial gauge exerting a downward pressure of 49 kPa ± 5 kPa on a measuring foot diameter of 10 mm ± 1 mm.

4.1.2.4 pH of water extract between 4,5 and 8,0, according to ISO 4045.

The black felt shall be dyed with Acid Black 24 (C.I. 26370).

NOTE An example of suitable wool felts available commercially is given in Annex A.

4.1.3 Grey scales for assessing change in colour and staining with half step ratings conforming to ISO 105-A02 and ISO 105-A03.

4.1.4 Assessment cabinet with artificial lighting as specified in ISO 105-A01. Alternatively, the assessment can be carried out in daylight from the north, when the test is carried out in the northern hemisphere, or daylight from the south when testing in the southern hemisphere.

4.1.5 Distilled or de-mineralized water complying with grade 3 of ISO 3696.

4.1.6 Synthetic perspiration solution containing per litre of solution:

— Sodium chloride, 5,0 g per litre of solution, g/cm^3.

— Ammonia solution, density 0,880 g/cm^3, 6,0 cm^3.

Artificial perspiration solutions described in 4.4.9 or 4.4.10 may be used. In this case, specific mention shall be included in the test report.

4.1.7 White spirit, general purpose reagent grade.

4.2 Method B – Circular rub machine

4.2.1 Test machine with the following:

4.2.1.1 Rigid horizontal platform (preferably metal) capable of clamping the test specimen.

4.2.1.2 Vertical rotating spindle capable of holding the circular felt pad.

4.2.1.3 Means of rotating the felt pad at a speed of 15,6 rad/s ± 0,5 rad/s[1)].

4.2.1.4 Means of loading the rotating felt pad with a force of either 24,5 N ± 0,5 N or 7,1 N ± 0,2 N.

4.2.1.5 Means of counting the number of revolutions of the felt pad.

4.2.2 Circular pads of scoured pure wool felt with central holes, with the following requirements:

a) Outside diameter 25 mm ± 1 mm, bore diameter 3 mm ± 0,5 mm.

b) Thickness, to be measured by one of the following methods:

Thickness	Downward pressure/presser foot size	Specimen
6,5 ± 0,5	49 kPa ± 5 kPa/10 mm ± 1 mm	Cut pads or uncut sheet material
5,0 ± 0,5	2,0 kPa ± 0,2 kPa/19 mm ± 10 mm	Cut pads

c) Density 190 kg/m^3 ± 20 kg/m^3.

4.2.3 Grey scales for assessing the change in colour and degree of staining complying with ISO 105-A02 and ISO 105-A03 respectively.

4.2.4 Metal plate approximately 75 mm × 65 mm and thickness 5 mm with a hole diameter 25 mm through its centre for use in the wetting from the back with organic solvents test described in 6.2.2.6.

1) 1 rad ≈ 0,16 rev.

4.2.5 Polished aluminium disc (diameter approximately 50 mm and thickness approximately 12 mm) to help cool the test specimen in dry rub tests.

4.2.6 Balance, capable of weighing masses up to 5 g to an accuracy of 10 mg.

4.2.7 Assessment cabinet with artificial lighting as specified in ISO 105-A01. Alternatively, the assessment can be carried out in daylight from the north, when the test is carried out in the northern hemisphere, or daylight from the south when testing in the southern hemisphere.

4.2.8 Distilled or deionised water complying with grade 3 of ISO 3696 for the wet rub test described in 6.2.2.3.

4.2.9 Synthetic perspiration solution, for the perspiration rub test described in 6.2.2.4, consisting of:

— Sodium chloride, 5 g per litre of solution, g/cm^3.

— Ammonia solution, density 0,880 g/cm^3, 6,0 cm^3.

Artificial perspiration solutions described in 4.4.9 or 4.4.10 may be used. In this case, specific mention shall be included in the test report.

4.2.10 White spirit (e.g. CAS n.64742-48-9) for the spirit rub test described in 6.2.2.5.

4.2.11 Organic solvents (as used for solvent activated stiffeners) for the wetting from the back with organic solvents test described in 6.2.2.6.

4.3 Method C – Crockmeter

4.3.1 The device shall have a rubbing finger consisting of a cylinder of 16 mm ± 0,1 mm diameter which is driven to carry out a linear reciprocating motion along a 100 mm ± 5 mm track on the specimen, exerting a downward force of 9 N ± 0,2 N.

4.3.2 White cotton rubbing cloth, desized, bleached, without finish, complying with ISO 105-F09. The cloth is cut into squares measuring approximately 50 mm × 50 mm, for the rubbing finger 4.3.1.

4.3.3 Grey scales for assessing the degree of staining complying with ISO 105-A03.

4.3.4 Assessment cabinet with artificial lighting as specified in ISO 105-A01. Alternatively, the assessment can be carried out in daylight from the north, when the test is carried out in the northern hemisphere, or daylight from the south when testing in the southern hemisphere.

4.4 Method D

4.4.1 Petri dish large enough to accommodate a glass plate (4.4.2) for each test specimen assembly.

4.4.2 Glass plate of length at least 110 mm and width at least 55 mm with a mass of 100 g ± 2 g for each test specimen assembly.

4.4.3 Rectangular pieces of multifibre fabric type DW as specified in ISO 105-F10 of dimensions 100 mm ± 5 mm × 50 mm ± 2 mm.

4.4.4 Oven maintained at a temperature of 37 °C ± 2 °C.

4.4.5 Grey scales for assessing change in colour and staining with half steps as described in ISO 105-A02 and A03.

4.4.6 Assessment cabinet with artificial lighting as specified in ISO 105-A01. Alternatively, the assessment can be carried out in daylight from the north, when the test is carried out in the northern hemisphere, or daylight from the south when testing in the southern hemisphere.

4.4.7 Balance capable of measuring mass up to 100 g to the nearest 0,1 g for testing yarns or loose fibres.

4.4.8 Distilled or de-mineralized water complying with grade 3 of ISO 3696.

4.4.9 Alkaline perspiration solution containing, per litre of solution;

— l-histidine monohydrochloride monohydrate: 5,00 g.

— Sodium chloride: 5,00 g.

— Disodium hydrogen orthophosphate dihydrate: 2,50 g.

After preparation, the solution is brought to pH 8 with 0,1 M sodium hydroxide solution.

NOTE Store the solution at 4 °C ± 1 °C. If the solution is more than one week old check its pH and adjust as necessary before use. Discard the solution if precipitated solids develop.

4.4.10 Acid perspiration solution containing, per litre of solution;

— l-histidine monohydrochloride monohydrate: 5,00 g.

— Sodium chloride: 5,00 g.

— Sodium dihydrogen orthophosphate dihydrate: 2,50 g.

After preparation, the solution is brought to pH 5,5 with 0,1 M hydrochloric acid solution.

Store the solution at 4 °C ± 1 °C. If the solution is more than one week old, check its pH and adjust as necessary before use. Discard the solution if precipitated solids develop.

5 Sampling and conditioning

5.1 Method A – Veslic

5.1.1 Rectangular test specimens of sufficient size to be clamped firmly on the test platform (4.1.1.1) are required. The test specimens can be cut from the material in any direction. Typically test specimens shall be of minimum dimensions 100 mm × 25 mm.

For test machines that have test platforms of width 25 mm, separate test specimens are required for each number of rubs or test condition to be used.

For test machines that have wider test platforms and the ability to position the test finger (4.1.1.5) at different positions across the width of the platform, wider test specimens can be used so that separate rubbing tracks can be used side by side.

5.1.2 Place the test specimens in a conditioned atmosphere as specified in ISO 18454 for 24 h prior to test.

NOTE Test specimens can be cut either from materials likely to be used in footwear or from made-up uppers or finished footwear.