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# ISO 17076-1

# IULTCS/IUP 48-1

Second edition
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# Leather — Determination of abrasion resistance —

## Part 1: Taber® method

*Cuir — Détermination de la résistance à l'abrasion —*

*Partie 1: Méthode Taber®*



Reference numbers
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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).

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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.

This document was prepared by the Physical Test Commission of the International Union of Leather Technologists and Chemists Societies (IUP Commission, IULTCS) in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 289, *Leather*, the secretariat of which is held by UNI, in accordance with the agreement on technical cooperation between ISO and CEN (Vienna Agreement).

IULTCS, originally formed in 1897, is a world-wide organization of professional leather societies to further the advancement of leather science and technology. IULTCS has three Commissions, which are responsible for establishing international methods for the sampling and testing of leather. ISO recognizes IULTCS as an international standardizing body for the preparation of test methods for leather.

This second edition cancels and replaces the first edition (ISO 17076-1:2012), which has been technically revised. Moderate changes have been made to Clauses 5 and 7. Small changes have been made to Clause 8 d) and Annex A. Clause 3 has been added.

A list of all parts in the ISO 17076 series can be found on the ISO website.

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.

# Leather — Determination of abrasion resistance —

# Part 1:
# Taber® method

## 1 Scope

This document specifies a method of determining the abrasion resistance of leather using a Taber® apparatus.

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

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

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

ISO 6103, *Bonded abrasive products — Permissible unbalances of grinding wheels as delivered — Static testing*

## 3 Terms and definitions

No terms and definitions are listed in this document.

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 test piece is rotated on a vertical axis against the sliding rotation of two abrading wheels which are pressed against the test piece with a specified force. One abrading wheel rubs the test piece outwards towards the periphery, the other inwards to the centre. Any damage to the test piece is noted along with any change in colour.

NOTE This method is also referred to as the "Taber® test".

## 5 Apparatus

**5.1 Horizontal, motor-driven platform,** rotating at (60 ± 5) rpm.

**5.2 Removable, flat, circular test piece holder**.

**5.3 Pair of pivoted arms**, for holding the abrasive wheels with the inner edge of the wheels (26,2 ± 0,5) mm from the centre of the motor shaft and pressing each abrasive wheel against the test piece with a force of (2,5 ± 0,1) N.

The arms should preferably be designed so that, without any counterweights or additional masses, each would exert a force of 2,5 N on the abrasive wheel.

**5.4 Vacuum nozzle**, with inlet set approximately 7 mm above the upper surface of the test piece.

**5.5 Counter**, indicating the number of revolutions of the platform (5.1).

**5.6 Abrasive wheels**, tungsten carbide ("S" series, e.g. "S-35", see Annex A), rubber-based ("CS" series, e.g. "CS-10", see Annex A) or silicon carbide ("H" series, e.g. "H-22", see Annex A), width (12,7 ± 0,1) mm, maximum diameter 51,7 mm and minimum diameter 44,0 mm. Abrasive wheels are gradually abraded away during use. The maximum diameter of 51,7 mm is the diameter of a new wheel. Used wheels shall be discarded when the diameter falls to 44,0 mm. The type of abrasive wheels to be used should be agreed with the client and the type of wheel used reported in the test report [8 c)]. Other types of abrasive wheels can also be used at the client's request. The abrasive wheels used in the test should be of the same diameter.

**5.7 Additional weights**, to increase the force between the abrasive wheel and the test piece to (4,9 ± 0,2) N or (9,8 ± 0,4) N.

**5.8 Specimen mounting sheet**, such as a card of minimum 1,0 mm thickness, with an adhesive where necessary, to keep the test pieces rigid and flat.

**5.9 Vacuum cleaner**, with an adapter to connect to the nozzle (5.4).

**5.10 Abrasive paper**, silicon carbide, grade 150, for example E150 (FEPA standard) or Cami 150 grit.

**5.11 Soft brush or compressed air**.

**5.12 Brush,** stiff bristle.

**5.13 Grey scale**, for assessing change in colour conforming to ISO 105-A02.

**5.14 Magnifier with fourfold to sixfold magnification**, for visual evaluation of the friction track.

**5.15 Suitable apparatus for preparation and reconditioning of the rubber-based and silicon carbide abrasive wheels** and ensuring that the re-faced wheel is within the permissible unbalances of grinding wheels specified in ISO 6103, and that there is full surface and perpendicular contact with the test pieces. A diamond re-facing tool is required for preparing silicon carbide abrasive wheels (Annex A).

## 6 Sampling and sample preparation

**6.1** Sample in accordance with ISO 2418.

If there are more than two hides or skins to be tested in one batch then only one sample needs be taken from each hide or skin, provided that the overall total is not less than three test pieces.

**6.2** Apply the specimen mounting sheet (5.8) to the sample, if required. Cut three circular test pieces of diameter (106 ± 1) mm with a central circular hole to fit over the central drive shaft.

**6.3** Condition in accordance with ISO 2419. All testing should be carried out in a standard atmosphere as specified in ISO 2419.

# 7 Procedure

## 7.1 Preparation of abrasive wheels

**7.1.1** Prepare rubber-based abrasive wheels ("CS" series) using the procedure in 7.1.2 to 7.1.8. Prepare tungsten carbide ("S" series) abrasive wheels using the procedure in 7.1.9. Prepare silicon carbide wheels ("H" series) using the procedure in 7.1.10 to 7.1.12.

**7.1.2** Fit the rubber-based abrasive wheels to the pivoted arms (5.3), ensuring that the wheels are mounted on the correct arm with the labels facing towards the centre of the test piece holder.

**7.1.3** Fit the additional weights (5.7) to give a loading of (9,8 ± 0,4) N on each abrasive wheel.

**7.1.4** Fit a piece of abrasive paper (5.10) to the test piece holder.

**7.1.5** Lower the abrasive wheels onto the surface of the abrasive paper, turn on the vacuum (5.9), switch on the machine and run for 20 cycles.

**7.1.6** Replace the abrasive paper with a new piece of abrasive paper and repeat 7.1.5.

**7.1.7** Examine the abrasive wheels. If the colour is not uniform, repeat the abrasive preparation with a fresh piece of abrasive paper. If the colour is still not uniform, discard the wheels.

**7.1.8** Brush the wheels with a soft brush or use compressed air (5.11) to remove any debris.

Optionally, the preparation of rubber-based abrasive wheels can be performed by using the procedure in 7.1.11 to 7.1.12.

**7.1.9** Prepare tungsten carbide wheels by brushing with a stiff bristle brush (5.12) to remove any loose particles.

**7.1.10** Prepare silicon carbide abrasive wheels by using a diamond re-facing tool (5.15).

**7.1.11** Traverse the tip of the diamond re-facing tool across the face of each wheel so that a double traverse (i.e. one forward and one backward movement) takes 25 s. Apply the minimum force necessary to the wheel by the diamond re-facing tool to produce an effective preparation.

**7.1.12** Brush the wheels with a stiff bristle brush (5.12) or use compressed air (5.11) to remove any loose particles.

## 7.2 Abrasion of test pieces

**7.2.1** Fit the prepared abrasive wheels (7.1) or reconditioned abrasive wheels (7.3) to the pivoted arms (5.3), ensuring that the wheels are mounted on the correct arm with the labels facing towards the centre of the test piece holder.

**7.2.2** Select the weights (5.7) to give a loading of either (2,5 ± 0,1) N (no additional weight), (4,9 ± 0,2) N or (9,8 ± 0,4) N on each abrasive wheel. The weight used is recorded in the test report [7 c)].

NOTE Generally, an additional weight of (4,9 ± 0,2) N is used, but the client will specify the weight to be used.

**7.2.3** Fit a prepared and mounted test piece (6.2) to the test piece holder.

**7.2.4** Lower the abrasive wheels onto the test piece, turn on the vacuum (5.9), switch on the machine and run for the specified number of cycles.

**7.2.5** Stop the machine and remove the test piece. Examine the test piece visually and by using the magnifier (5.14), and record any damage excluding any damage 2 mm from the edge of the tested area or in depressed areas caused by starting or stopping the machine. If required, use the grey scale (5.13) to determine the colour change of the tested area.

**7.2.6** Replace the test piece and continue the abrasion to the next specified number of cycles. Repeat 7.2.5.

**7.2.7** Repeat 7.2.6 for any other number of cycles given in 7.2.4.

### 7.3 Reconditioning of abrasive wheels

**7.3.1** Recondition rubber-based abrasive wheels ("CS" series) using the procedure in 7.3.2 to 7.3.5. Recondition tungsten carbide abrasive wheels ("S" series) using the procedure in 7.3.6. Recondition silicon carbide wheels ("H" series) using the procedure in 7.3.7 to 7.3.9.

**7.3.2** Prior to each test recondition rubber-based abrasive wheels. Tungsten and silicon wheels should be reconditioned as deemed necessary.

**7.3.3** Repeat 7.1.3 to 7.1.5.

**7.3.4** Brush the wheels with a soft brush (5.11) to remove any debris.

**7.3.5** Use abrasive paper (5.10) for a maximum of 60 cycles (i.e. use for reconditioning three wheels and then replace).

NOTE Optionally, the reconditioning of rubber-based abrasive wheels can be performed by using the procedure in 7.3.8 to 7.3.9.

**7.3.6** Recondition the tungsten carbide wheels by brushing with a stiff bristle brush (5.12) to remove any loose particles.

**7.3.7** Recondition silicon carbide abrasive wheels by using a diamond re-facing tool (5.15).

**7.3.8** Traverse the tip of the diamond re-facing tool across the face of each wheel so that a double traverse (i.e. one forward and one backward movement) takes 25 s. Apply the minimum force necessary to the wheel by the diamond re-facing tool to produce an effective reconditioning.

**7.3.9** Brush the wheels with a stiff bristle brush (5.12) or use compressed air (5.11) to remove any loose particles.

## 8 Test report

The test report shall include the following:

a) reference to this document, i.e. ISO 17076-1:2020;

b) the number of test cycles;

c) the type of abrasive wheel and the loading used for the test;

d) any observed damage; or if required, use photographs or return the test pieces to the client to illustrate damage;

e) any colour change expressed in terms of a grey scale rating, if required;

f) the standard atmosphere used for conditioning and testing as given in ISO 2419;

g) any deviations from the method specified in this document;

h) full details for identification of the sample and any deviations from ISO 2418 with respect to sampling.