BS EN ISO 17076-2:2011

Incorporating corrigendum July 2012

BSI Standards Publication

Leather — Determination of abrasion resistance

Part 2: Martindale ball plate method (ISO 17076-2:2011)

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National foreword

This British Standard is the UK implementation of EN ISO 17076-2:2011. Together with BS EN ISO 17076-1:2012, it supersedes BS EN 14327:2003 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee TCI/69, Footwear, leather and coated fabrics.

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

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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Compliance with a British Standard cannot confer immunity from legal obligations.

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Amendments/corrigenda issued since publication

Date	Text affected
July 2012	Correction to supersession details in National foreword

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN ISO 17076-2

June 2011

ICS 59.140.30

Supersedes EN 14327:2003

English Version

Leather - Determination of abrasion resistance - Part 2: Martindale ball plate method (ISO 17076-2:2011)

Cuir - Détermination de la résistance à l'abrasion - Partie 2: Méthode Martindale avec plateau à billes (ISO 17076-2:2011)

Leder - Bestimmung des Abriebwiderstandes - Teil 2: Martindale-Kugelplatte-Verfahren (ISO 17076-2:2011)

This European Standard was approved by CEN on 14 June 2011.

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EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: Avenue Marnix 17, B-1000 Brussels

Ref. No. EN ISO 17076-2:2011: E

Foreword

This document (EN ISO 17076-2:2011) has been prepared by Technical Committee CEN/TC 289 “Leather”, the secretariat of which is held by UNI, in collaboration with the IULTCS "International Union of Leather Technologists and Chemists Societies".

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of an identical text or by endorsement, at the latest by December 2011, and conflicting national standards shall be withdrawn at the latest by December 2011.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 14327:2003.

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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ISO 17076-2 was prepared by the European Committee for Standardization (CEN) Technical Committee CEN/TC 289, *Leather*, in collaboration with the Physical Tests Commission of the International Union of Leather Technologists and Chemists Societies (IUC Commission, IULTCS), in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement). This method is technically similar to the method in IUP 48-2.

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.

ISO 17076 consists of the following parts, under the general title *Leather — Determination of abrasion resistance*:

— *Part 1: Taber method*

— *Part 2: Martindale ball plate method*

INTERNATIONAL STANDARD

ISO 17076-2:2011(E)
IULTCS/IUP 48-2:2011(E)

Leather — Determination of abrasion resistance —

Part 2:
Martindale ball plate method

1 Scope

This part of ISO 17076 specifies a method of determining the abrasion resistance of upholstery leather for different applications using Martindale apparatus with a ball plate. The method is applicable to semi-aniline, pigmented and coated leather.

2 Normative references

The following referenced documents are indispensable for the application 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 2419, *Leather — Physical and mechanical tests — Sample preparation and conditioning*

ISO 11641, *Leather — Tests for colour fastness — Colour fastness to perspiration*

ISO 12947-1, *Textiles — Determination of the abrasion resistance of fabrics by the Martindale method — Part 1: Martindale abrasion testing apparatus*

ISO 12947-4, *Textiles — Determination of the abrasion resistance of fabrics by the Martindale method — Part 4: Assessment of appearance change*

3 Principle

The procedure is based on the method described in ISO 12947-4 and modified to use a ball plate underneath the specimen to better simulate day-to-day use.

4 Apparatus and materials

4.1 **Martindale abrasion testing apparatus** and **materials**, in accordance with ISO 12947-1.

4.2 **Abrasion holder**, diameter 38 mm, in accordance with ISO 12947-1.

4.3 **Loading piece**, with a mass of (795 ± 7) g (pressure of 12 kPa) in accordance with ISO 12947-1.

4.4 **Mounting weight**, with a mass of (2,5 ± 0,5) kg, diameter of (120 ± 10) mm in accordance with ISO 12947-1.

4.5 **Abrading fabric**, in accordance with ISO 12947-1, diameter 38 mm.

4.6 **Felt**, in accordance with ISO 12947-1, diameter 140 mm.

4.7 **Foam**, in accordance with ISO 12947-1, diameter 38 mm.

4.8 **Suitable circular sample cutter** or **press knife**, with a diameter of approximately 150 mm.

4.9 **Ball plate**, with 37 steel balls (see Figure 1).

Description of ball plate:

— diameter: 120 mm;

— thickness: 4,5 mm;

— material: steel or aluminium;

— arrangement: one ball in centre;

— ball diameter: 5,00 mm;

— ball material: steel;

— grid spacing: 17 mm.

After the steel balls have been inserted, the whole plate is compressed between two parallel steel plates with approximately 18 kN, to be sure that all balls are exactly inserted at the same height.

4.10 **Synthetic perspiration solution**, of pH = 8,0 in accordance with ISO 11641, freshly prepared each day.

4.11 **Cylindrical vessel**, with inside diameter 60 mm to 63 mm and height of at least 30 mm.

4.12 **Magnifier**, with a magnification of 4× to 6× or a **transportable microscope**, with magnification of 50×.

5 Sampling and sample preparation

5.1 Prior to cutting the test specimens, condition the leather in accordance with ISO 2419.

5.2 Cut at least two specimens with a diameter of 150 mm for dry testing in accordance with ISO 2419 using a sample cutter or press knife (4.8). If required, cut at least two additional specimens for testing with synthetic perspiration solution.

Dimensions in millimetres

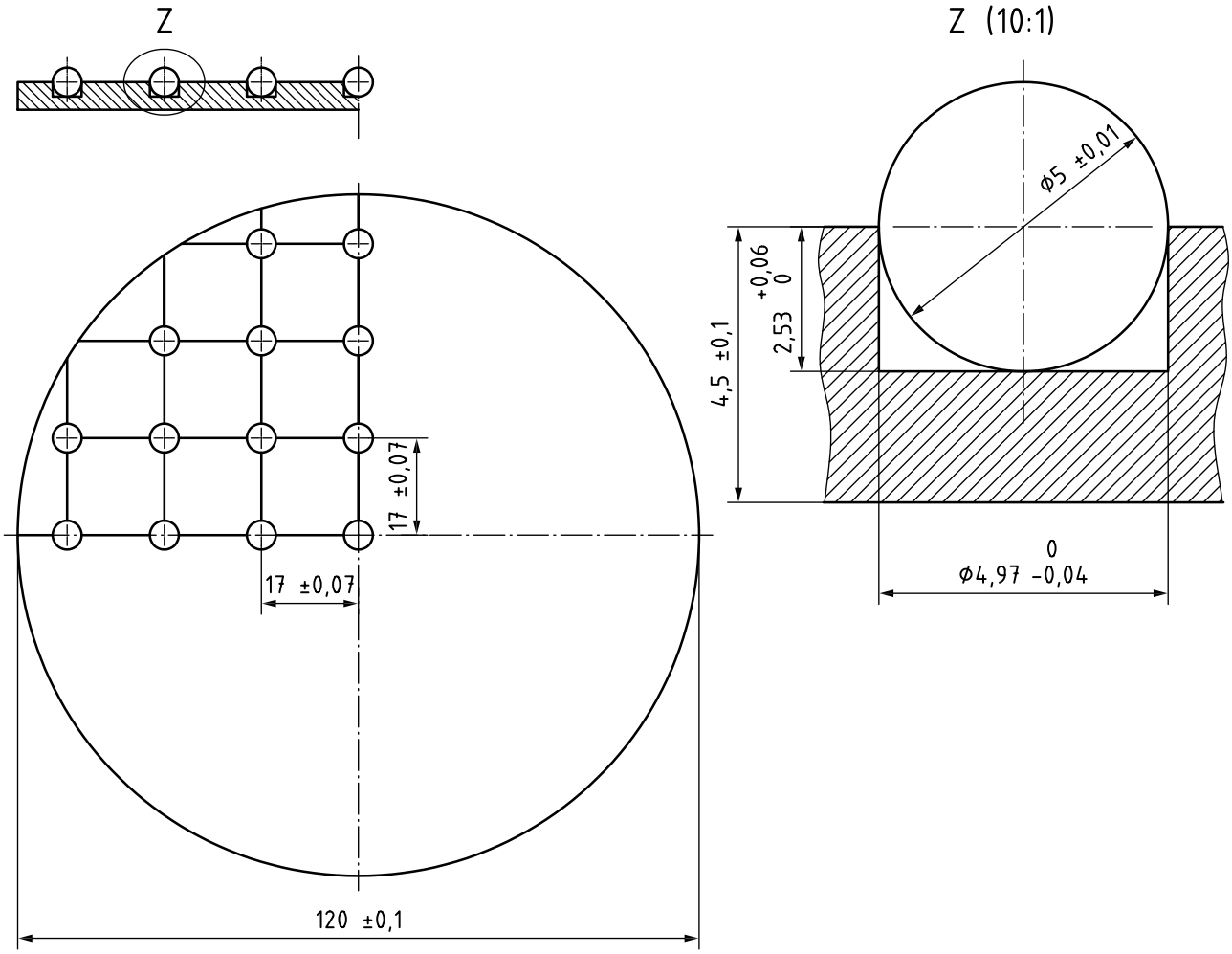

Figure 1 — Drawings of ball plate

6 Test procedure

6.1 Number of tests

The procedure should be performed at least in duplicate.

6.2 Dry testing

6.2.1 Fix the abrading fabric (4.5) backed with the foam (4.7) in the 38 mm abrasion holder (4.2) as described in ISO 12947-4.

6.2.2 The abrasion procedure takes place on the abrading table of the Martindale abrasion apparatus (4.1). Use the following test set-up on the specimen table: felt (4.6), followed by the ball plate (4.9), followed by the leather specimen. Adjust the ball plate with the balls upwards into the test apparatus so that its grid is aligned parallel to the diagonals of the square of the Lissajous figure (see Figure 2). Fix the leather specimen as described in ISO 12947-4 using the mounting weight (4.4) to ensure that no wrinkles are formed on the specimen surface. Check that the specimens, ball plate and wool felt are centrally positioned in the clamp of the abrading table. Ensure that the balls stay in the adjusted position after clamping.

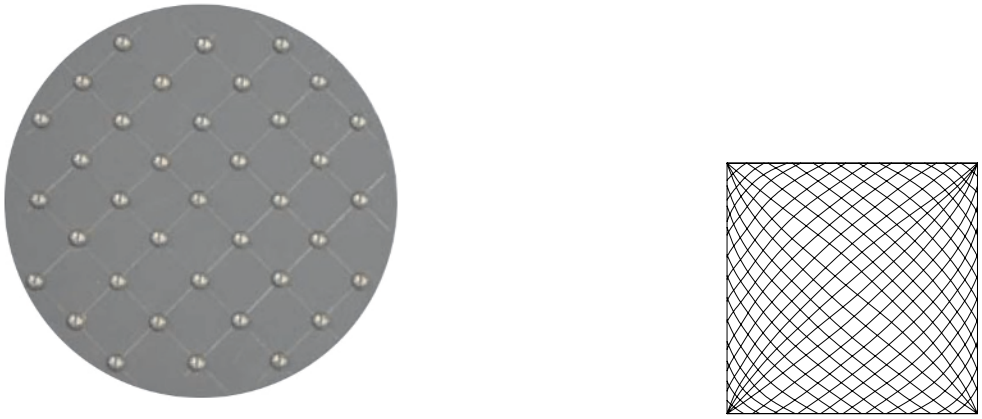

Figure 2 — Orientation of ball plate relative to the Lissajous figure

6.2.3 Mount the abrasion holder (4.2) with the abrading fabric (4.5) on the Martindale apparatus. Add the loading piece (4.3) and carry out 100 rubs, as defined in ISO 12947-1.

6.2.4 Remove the abrasion holder with the abrading fabric from the Martindale apparatus and assess the leather surface visually. Note the number of places of finish breakdowns. A finish breakdown is reached if the finish layer is completely damaged and leather fibres are visible. To ensure assessment results, a magnifier or a portable microscope (4.12) can be used.

6.2.5 Repeat step 6.2.3 and 6.2.4 until 4 or more places of finish breakdown have been created. Report the number of rubs necessary to reach 4 places of finish breakdowns.

NOTE In order to reduce the time needed for testing, it can be helpful to run a pre-test with 100 rubs without stopping before the first assessment, as leathers with a strong abrasion resistance might need considerably more rubs before their finish collapses in one or more spots. Then continue with 100 rubs.

6.3 Test with synthetic perspiration solution (optional)

6.3.1 Fix the abrading fabric (4.5) backed with the foam (4.7) in the 38 mm abrasion holder (4.2) as described in ISO 12947-4.

6.3.2 Place 2 ml of synthetic perspiration solution (4.10) in the cylindrical vessel (4.11). Place the specimen holder in the vessel, with the abrading fabric in contact with the synthetic perspiration solution, for a period of $(5 \pm 0{,}5)$ min.

6.3.3 Follow the procedure described in 6.2.2 to 6.2.5. After 500 rubs each, rewet the abrasion fabric as described in 6.3.2 using a fresh synthetic perspiration solution.

7 Test report

The test report shall include the following information:

a) a reference to this part of ISO 17076 (i.e. ISO 17076-2:2011);

b) a description of the leather tested;

c) value of number of rubs necessary to reach 4 or more places of finish breakdowns for dry testing and the corresponding number of places with finish breakdown for each specimen tested;

d) mean value of number of rubs necessary to reach 4 places of finish breakdowns for dry testing;

e) any deviations from this method.

If the test has been performed with synthetic perspiration solution, report in addition the following information:

f) mean value of number of rubs necessary to reach 4 places of finish breakdowns for testing with synthetic perspiration solution;

g) synthetic perspiration solution used and its pH.

Annex A
(informative)

Examples of breakdowns (photographed with 50× magnification)

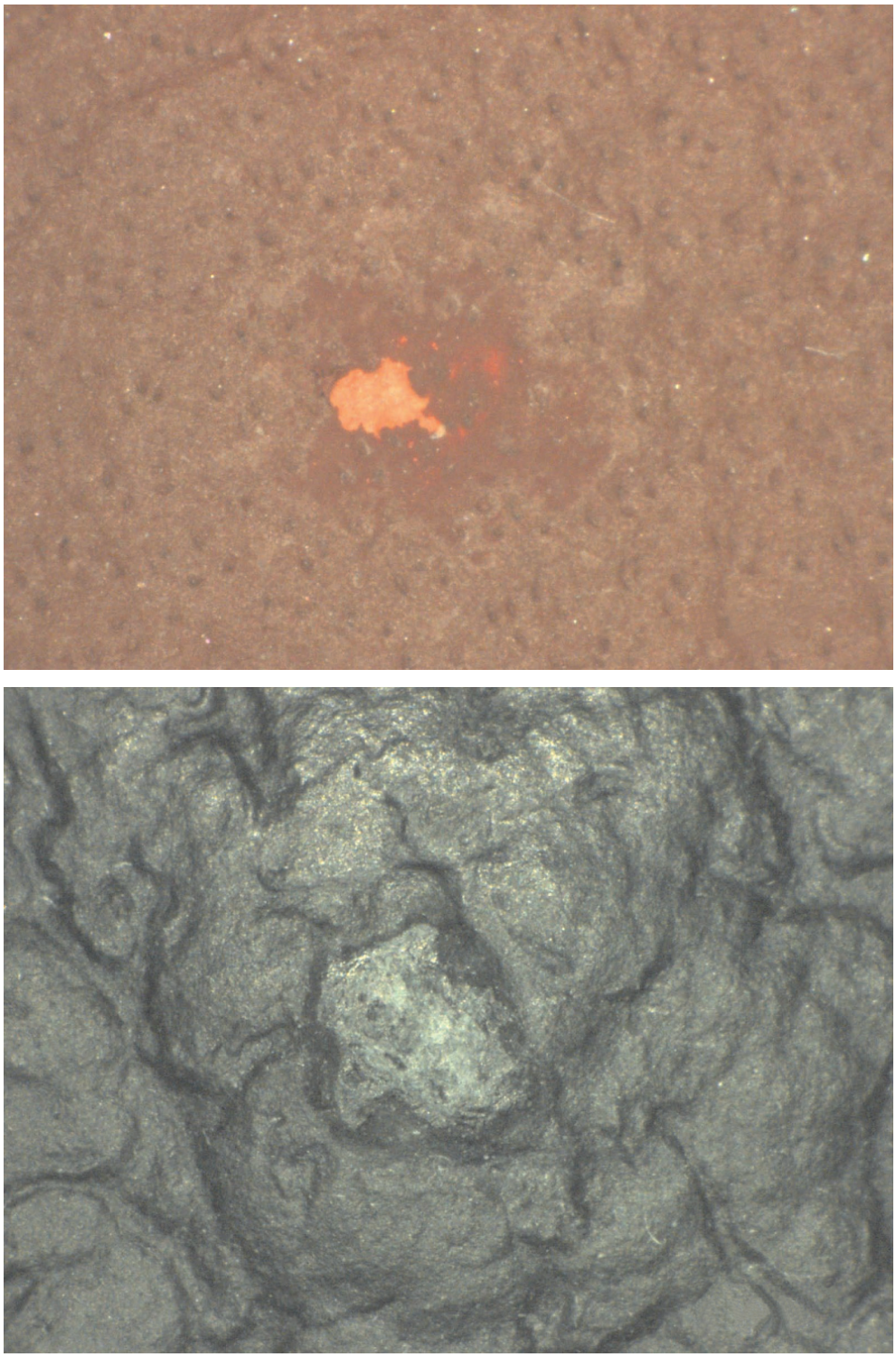

Figure A.1 — Photographs of breakdowns

Bibliography

[1] ISO 17076-1, *Leather — Determination of abrasion resistance — Part 1: Taber method*

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