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Leather — Physical and mechanical tests — Determination of extension set

Cuir — Essais physiques et mécaniques — Détermination de la déformabilité

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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.

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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 17236 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). It is based on IUP 43 which was published in *J. Soc. Leather Tech. Chem.* **84**, p. 399, (2000) and confirmed as an official method in March 2001.

Leather — Physical and mechanical tests — Determination of extension set

1 Scope

This International Standard specifies a method for determining the extension set of leather. It is intended for use on upholstery leather but is applicable to all flexible leathers.

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

ISO 2419 *Leather - Physical and mechanical tests - Sample preparation and conditioning*

ISO 2589 *Leather - Physical and mechanical tests - Determination of thickness*

ISO 7500-1 *Metallic materials - Verification of static uniaxial testing machines - Part 1: Tension/compression testing machines - Verification and calibration of the force-measuring system*

3 Principle

A test piece is repeatedly extended at a specified rate until the forces reach a predetermined level and the permanent extension is calculated as a percentage of the original length.

4 Apparatus

4.1 Tensile testing machine, having a force range appropriate to the specimen under test and consisting of a means of recording the force (4.1.1) and jaws that operate at a uniform speed of separation of 50 mm ± 5 mm/min.

4.1.1 Means of recording the force, to an accuracy as specified by Class 2 of ISO 7500-1.

4.1.2 Jaws, minimum length 30 mm in the direction of the applied load, designed to apply constant clamping by mechanical or pneumatic means. The texture and design of the inside faces of the jaws shall be such that at the maximum load attained in the test the test piece does not slip at either jaw.

4.2 Thickness gauge, as specified in ISO 2589.

4.3 Press knife, the inner wall of which is a rectangle 250 mm ± 5 mm x 10,0 mm ± 0,5 mm, conforming to the requirements of ISO 2419.

4.4 Ruler, reading to 0,5 mm.

4.5 Stopwatch, reading to 1 s.

5 Sampling and sample preparation

5.1 Sample in accordance with ISO 2418.

5.2 Cut six test pieces by applying the press knife (4.3) to the grain surface. Cut three test pieces with the longer edge parallel to the backbone and three with the longer edge perpendicular to the backbone.

NOTE 1 In the case of small skins, the number of test pieces may have to be reduced because of the size of the test piece.

NOTE 2 If there is a requirement for more than two hides or skins to be tested in one batch, then only one test piece in each direction need be taken from each hide or skin, provided that the overall total is not less than three test pieces in each direction.

5.3 Condition the test pieces in accordance with ISO 2419.

5.4 Measure the thickness in accordance with ISO 2589.

6 Procedure

6.1 Mark a line 35 mm ± 5 mm from each short edge of the test piece with the line parallel to the short edges.

6.2 Using the ruler measure the distance, L_0, between the two lines to the nearest 1 mm.

6.3 Set the jaws of the tensile testing machine (4.1) 200 mm apart. Clamp the test piece in the jaws such that the short edges of the test piece are parallel to the edges of the jaws, and about 25 mm of the test piece is clamped in each jaw. When the test piece is clamped its grain surface shall lie in one plane.

6.4 Run the tensile test machine until a load of 20,0 N ± 0,5 N is reached. Immediately this load is reached stop the crosshead and keep the crosshead stopped in that position for 10 s ± 1 s.

NOTE Stopping the crosshead keeps the sample under load although relaxation of the test piece means that the load will fall slightly.

6.5 Return the crosshead to its start position as rapidly as possible.

6.6 Repeat 6.4 to 6.5 so that the test piece is subjected to a total of 5 extension cycles.

NOTE The cycling of the tensile test machine may be carried out manually using the stopwatch for timing or it may be by programming the load and timing into the tensile test machine.

6.7 Remove the test piece from the tensile test machine immediately after the final load cycle (6.4). Start the stopwatch and lay the test piece on a flat surface with the lines applied as described in 6.1 uppermost. 60 s ± 5 s after removing the test piece from the tensile tester, measure the distance, L_1, between the lines to the nearest 1 mm.

6.8 Repeat 6.1 to 6.7 for other test pieces.

6.9 If there is slippage of the test piece at either jaw reject the result and repeat the determination with a new test piece.

7 Expression of results

The percentage extension set, E_s, shall be calculated using the formula:

$$E_s = \frac{(L_1 - L_0) \times 100}{L_0}$$

where:

L_1 is the final distance between the marks, in millimetres measured as described in 6.7

L_0 is the initial distance between the marks, in millimetres measured as described in 6.2

8 Test report

The test report shall include the following:

a) reference to this International Standard, i.e. ISO 17236 : 2002;

b) the mean percentage extension set, E_s, in each direction;

c) the mean thickness of the test piece in each direction;

d) the standard atmosphere used for conditioning and testing as given in ISO 2419 (i.e., 20 °C/65 % rh or 23 °C/50 % rh);

e) any deviations from the method specified in this International Standard;

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

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