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Leather — Physical and mechanical tests — Determination of abrasion resistance of automotive leather

Cuir — Essais physiques et mécaniques — Détermination de la résistance à l'abrasion du cuir pour l'automobile

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Foreword

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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.

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.

ISO 17076 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. It was published as EN 14327. It is based on IUP 48 published in *J. Soc. Leather Tech. Chem.*, **86** (7), p. 363, 2002, and declared an official method of the IULTCS in May 2003.

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.

Leather — Physical and mechanical tests — Determination of abrasion resistance of automotive leather

1 Scope

This International Standard specifies a method of determining the abrasion resistance of automotive 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 2418, *Leather — Chemical, physical and mechanical and fastness tests — Sampling location*

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

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

3 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 of colour.

NOTE This method is also referred to as the “Taber Test”.

4 Apparatus

4.1 Horizontal, motor driven platform, rotating at 60 rpm ± 5 rpm.

4.2 Removable, flat, circular test piece holder.

4.3 Pair of pivoted arms, for holding the abrasive wheels with the inner edge of the wheels 26,20 mm ± 0,25 mm from the centre of the motor shaft and pressing each abrasive wheel against the test piece with a force of 2,5 N ± 0,1 N.

4.4 Vacuum nozzle, with inlet set just above the upper surface of the test piece.

4.5 Counter, indicating the number of revolutions of the platform (4.1).

4.6 Abrasive wheels, tungsten carbide or rubber based, width 12,7 mm ± 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 are discarded when the diameter falls to 44,0 mm. The type of tungsten carbide and rubber based wheels to be used are agreed by the parties involved and the type of wheel used is reported in the test report [7 c)]. The abrasive wheels used in the test should be of the same diameter.

4.7 Additional weights, to increase the force between the abrasive wheel and the test piece to 5 N ± 0,1 N or 10 N ± 0,1 N.

4.8 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.

4.9 Vacuum cleaner, domestic type, with adapter to connect to nozzle (4.4).

4.10 Abrasive paper, silicon carbide, grade E150.

4.11 Soft brush or compressed air.

4.12 Brush, stiff bristle.

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

5 Sampling and sample preparation

5.1 Sample in accordance with ISO 2418.

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

5.2 Apply specimen mounting sheet (4.8) to the sample, if required. Cut three circular test pieces of diameter 106 mm ± 1 mm with a central circular hole to fit over the central drive shaft.

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

6 Procedure

6.1 Preparation of new wheels

6.1.1 Prepare new rubber abrasive wheels using the procedure in 6.1.2 to 6.1.8. Prepare new tungsten carbide abrasive wheels using the procedure in 6.1.9.

6.1.2 Fit the rubber abrasive wheels to the pivoted arms (4.3) ensuring that the wheels are mounted on the correct arm with the labels facing outwards.

6.1.3 Fit the additional weights (4.7) to give a loading of 10 N ± 0,1 N on each abrasive wheel.

6.1.4 Fit a piece of abrasive paper (4.10) to the test piece holder.

6.1.5 Lower the abrasive wheels onto the surface of the abrasive paper, turn on the vacuum (4.9), switch on the machine and run for 20 cycles.

6.1.6 Replace the abrasive paper and repeat 6.1.5.

6.1.7 Examine the abrasive wheels. If the colour is not uniform repeat the abrasive treatment with a fresh piece of abrasive paper. If the colour is still not uniform discard the wheels.

6.1.8 Brush the wheels with a soft brush or use compressed air (4.11) to remove any debris.

6.1.9 Prepare new tungsten carbide wheels by brushing with a stiff bristle brush (4.12) to remove any loose particles.

6.2 Abrasion of test pieces

6.2.1 Fit the prepared new abrasive wheels (6.1) or reconditioned abrasive wheels (6.3) to the pivoted arms (4.3) ensuring that the wheels are mounted on the correct arm with the labels facing outwards.

6.2.2 Select the weights (4.7) to give a loading of either 2,5 N ± 0,1 N (no additional weight), 5 N ± 0,1 N or 10 N ± 0,1 N on each abrasive wheel.

NOTE Generally, an additional weight of 5 N ± 0,1 N is used, but the automotive manufacturer will specify the weight to be used. The weight used is recorded in the test report [7 c)].

6.2.3 Fit a prepared and mounted test piece (5.2) to the test piece holder.

6.2.4 Lower the abrasive wheels onto the test piece, turn on the vacuum cleaner (4.9), switch on the machine and run for the specified number of cycles.

6.2.5 Stop the machine and remove the test piece. Examine the test piece 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 (4.13) to determine the colour change of the tested area.

6.2.6 Replace the test piece and continue the abrasion to the next number of cycles. Repeat 6.2.5.

6.2.7 Repeat 6.2.6 for any other number of cycles given in 6.2.4.

6.3 Reconditioning of abrasive wheels

6.3.1 Recondition rubber abrasive wheels using the procedure in 6.3.2 to 6.3.7. Recondition new tungsten carbide abrasive wheels using the procedure in 6.3.8.

6.3.2 Recondition rubber abrasive wheels after each completed test.

6.3.3 Fit the additional weights (4.7) to give a loading of 10 N ± 0,1 N on each abrasive wheel.

6.3.4 Fit a piece of abrasive paper (4.10) to the test piece holder.

6.3.5 Lower the abrasive wheels onto the surface of the abrasive paper, switch on the vacuum (4.9), switch on the machine and run for 20 cycles.

6.3.6 Brush the wheels with a soft camel hair brush (4.11) to remove any debris.

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

6.3.8 Recondition tungsten carbide wheels by brushing with a stiff bristle brush (4.12) to remove any loose particles. Any burring of the edges of the wheels after reconditioning should be removed by rotating the wheel by hand against abrasive paper (4.10).

7 Test report

The test report shall include the following:

a) a reference to this International Standard; i.e. ISO 17076:2006;

b) the number of test cycles;

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

d) any observed damage; use photographs or, if required, return test pieces to 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 (i.e. 20 °C/65 % RH, or 23 °C/50 % RH);

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

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