INTERNATIONAL STANDARD

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IULTCS/IUP 45

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Leather — Physical and mechanical tests — Determination of water penetration pressure

Cuir — Essais physiques et mécaniques — Détermination de la pression de pénétration de l'eau

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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.

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 17230 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 14289. It is based on IUP 45 published in *J. Soc. Leather Tech. Chem.*, **86** (7), p. 345, 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 water penetration pressure

1 Scope

This International Standard describes a method for determining the water penetration pressure of 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 3696, *Water for analytical laboratory use — Specifications and test methods*

3 Principle

A sample of leather is clamped over a container of water with the surface of the leather in contact with the water. The water pressure is raised at a specified rate and the pressure required to force droplets of water through the leather is measured.

4 Apparatus

4.1 Cup, in the form of a short non-corrosive metal circular cylinder, internal diameter 40,0 mm ± 0,2 mm with the open end uppermost.

4.2 Annular clamp, internal diameter 40,0 mm ± 0,2 mm, capable of clamping the leather test piece across the cup (4.1) without slippage when a pressure of 65 kPa is applied.

4.3 Stiff wire gauze, with eight holes per 25 mm, circular in shape and held in place around the circumference by the annular clamp (4.2), or welded into position.

4.4 Means of increasing pressure, such that the water in the cup is subjected to a uniform increase in pressure of 3 kPa/min ± 0,3 kPa/min to a maximum pressure of 65 kPa.

4.5 Distilled or deionized water, conforming to the requirements of grade 3 of ISO 3696.

4.6 Press knife, the inner surface of which is a right angled circular cylinder, capable of cutting a circular test piece which can be clamped between the cup (4.1) and annular clamp (4.2) and conforming to ISO 2419.

NOTE To preserve the area of a test skin or hide, the whole skin or hide may be placed on the test apparatus and the press knife becomes optional.

5 Sampling and sample preparation

5.1 Sample in accordance with ISO 2418. Cut three test pieces by applying the press knife (4.6) to the grain surface.

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 Carry out all further steps at 20 °C ± 2 °C or 23 °C ± 2 °C. There is no need to condition test pieces nor is there any need for humidity control.

6 Procedure

6.1 Fill the cup (4.1) with distilled or deionized water (4.5) at the controlled temperature (5.2).

6.2 Place the leather over the cup with the surface which would be wetted in wear in contact with the water. Place a stiff gauze over the leather and clamp in position.

NOTE The stiff gauze prevents the leather from becoming distended during the test.

6.3 Apply pressure to the water, increasing the pressure at a uniform rate of 3,0 kPa/min ± 0,3 kPa/min until completion of the test.

6.4 Observe the surface of the leather for the appearance of globules of water which have been forced through the leather and note the pressure when three such globules are visible. This is the water penetration pressure.

NOTE 1 The appearance of the third droplet is taken as the end point rather than the first so that the result will not be duly influenced by the presence of a few capillaries of slightly greater dimensions than the remainder.

NOTE 2 If the leather is not sufficiently waterproof to be assessed by this test, then failure will be as damp patches rather than discrete droplets. These results are less reliable. If the leather fails at a pressure of less than 2,5 kPa, then these low pressures are of little value in discriminating between samples.

6.5 If the third droplet has not appeared when a pressure of 65 kPa is reached, terminate the test.

7 Expression of results

7.1 Express the water penetration pressure to the nearest 0,1 kPa. If the leather has not failed at a pressure of 65 kPa, report the water penetration pressure as “greater than 65 kPa”.

7.2 If the leather fails because the water penetrates as damp patches, include this as a comment on the test report.

NOTE Penetration pressures are sometimes expressed as “mmHg” or “cmHg”. If the results are to be expressed in these units, then 1 kPa = 7,5 mmHg = 0,75 cmHg.

8 Test report

The test report shall include the following for each test piece:

a) a reference to this International Standard, i.e. ISO 17230:2006;

b) the water penetration pressure, in kPa;

c) the mode of failure if this is by formation of damp patches;

d) the temperature at which the test was carried out (i.e. 20 °C ± 2 °C or 23 °C ± 2 °C);

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.

Annex A
(informative)

Source of apparatus

One example of a suitable product available commercially is given below.

"R & B Hydrostatic Triple Head Tester"[1)] manufactured by:

R & B Instruments, Unit 3a, Farnley Low Mills, Bangor Terrace, Leeds LS12 5PS, UK.

1) "R & B Hydrostatic Triple Head Tester" is an example of a suitable product available commercially. This information is given for the convenience of users of this International Standard and does not constitute an endorsement by ISO of this product.