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Leather — Physical and mechanical tests — Determination of the static absorption of water

*Cuir — Essais physiques et mécaniques — Détermination de l'absorption
statique d'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 2417 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 7 originally published in *J. Soc. Leather Trades Chemists* **44**, p. 367, (1960) and declared an official method of the IULTCS in 1961. This updated version was published in *J. Soc. Leather Tech. Chem.* **84**, p. 323, (2000) and reconfirmed as an official method in March 2001. The same principle is used but the text has been updated and includes the number of test pieces to be taken.

This second edition cancels and replaces the first edition (ISO 2417:1972), which has been technically revised.

Leather — Physical and mechanical tests — Determination of the static absorption of water

1 Scope

This International Standard specifies a method for determining the water absorption of leather under static conditions. The method is applicable to all leather, particularly heavy 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 2420	Leather - Physical and mechanical tests - Determination of apparent density
ISO 3696 : 1987	Water for analytical laboratory use - Specification and test methods

3 Principle

A test piece of known mass or volume is immersed in water for a known period of time and the volume of water absorbed measured.

4 Apparatus

4.1 Glass Kubelka apparatus, as shown in Figure 1. The graduated scale shall be readable to 0,1 ml with an accuracy of ± 0.1 ml. The total volume of the bulb (A) and the graduated tube shall be $75 \text{ ml} \pm 2 \text{ ml}$.

4.2 Rubber stopper (C), fitted with a glass rod or a nickel or stainless steel wire of diameter about 1 mm and of sufficient length to keep the test piece at the end of the cylinder (B) distant from the stopper (C).

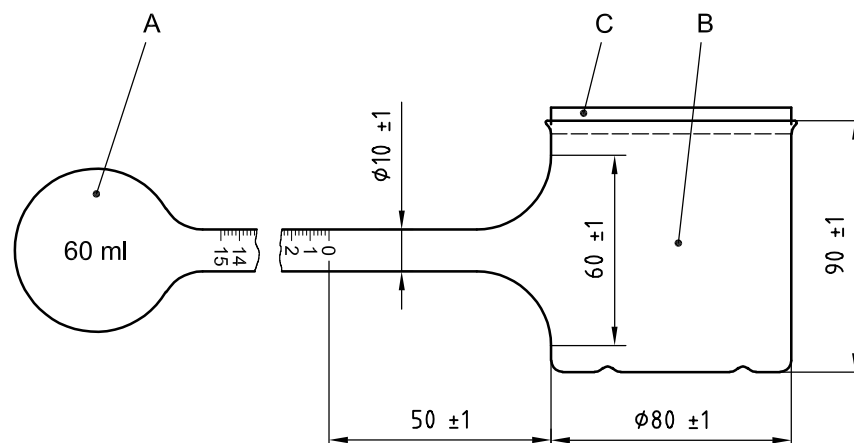


Figure 1 — Kubelka apparatus and stopper (all dimensions in millimetres)

4.3 Press knife, the inner wall of which is a right angled circular cylinder of diameter 70 mm $\pm$ 1 mm as specified in ISO 2419.

4.4 Balance, reading to 0,001 g.

4.5 Distilled or de-ionised water, conforming to the requirements of grade 3 of ISO 3696 : 1987.

5 Sampling and sample preparation

5.1 Sample in accordance with ISO 2418. From the sample, cut three test pieces by applying the press knife (4.3) to the grain surface. Condition the test pieces in accordance with ISO 2419.

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 Weigh the test piece to the nearest 0,001 g or determine its volume in accordance with ISO 2420.

5.3 Carry out all further operations at a temperature of 20 °C $\pm$ 2 °C or 23 °C $\pm$ 2 °C. There is no further need for humidity control.

6 Procedure

6.1 Ensure that the Kubelka apparatus (4.1) is clean and free of grease. Wet the interior surfaces with distilled or de-ionized water (4.5) and pour out the excess.

6.2 Place the apparatus with the bulb (A) directly below the cylinder (B) and fill with sufficient distilled or de-ionized water (4.5) at 20 °C $\pm$ 2 °C or 23 °C $\pm$ 2 °C to give a water level between 0 ml and 1 ml on the graduated scale. Record the scale reading.

6.3 Place the test piece in the cylinder (B) and pour the water from the bulb (A) into the cylinder. Close the cylinder with the stopper (C) to prevent evaporation losses and place the apparatus on a level surface.

6.4 After the test piece has been immersed for a specific time (see note 1 to 6.5) turn the apparatus so that the water drains into the bulb. 1 min after drainage, note the scale reading at the water level and calculate the volume of water absorbed.

6.5 If the water absorption is required at other time intervals, turn the apparatus immediately so that the water flows back into the cylinder (B) and again covers the test piece. Repeat the operation in 6.4.

NOTE 1 For most purposes measurements after two periods of immersion are sufficient. If possible, the periods should be taken from the following, 15 min $\pm$ 0,2 min; 30 min $\pm$ 0,2 min; 60 min $\pm$ 0,5 min; 120 min $\pm$ 0,5 min; 24 h $\pm$ 0,1 h.

NOTE 2 The periods of 1 min during which the water is being drained back are not to be considered as part of periods of immersion which precede them, but shall be considered as parts of subsequent periods of immersion. For example, if the water absorptions during periods of immersion of 15 min and 60 min are to be measured on the same test piece, and the instant of first immersion is at time zero, subsequent actions will be as follows:

- at 15 min, begin draining
- at 16 min, read off the residual volume and immediately re-immerses the test piece.
- at 60 min, begin draining
- at 61 min, read off the residual volume.