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STANDARD

ISO
17233

IULTCS/IUP
29

First edition
2002-12-15

**Leather — Physical and mechanical
tests — Determination of cold crack
temperature of surface coatings**

*Cuir — Essais physiques et mécaniques — Détermination de
la température de fissuration à froid des revêtements de la surface*

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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 17233 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 29 originally published in *J. Soc. Leather Tech. Chem.* **69**, p. 85, (1985) and declared an official method of the IULTCS in 1987. This updated version was published in *J. Soc. Leather Tech. Chem.* **84**, p. 369, (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.

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Leather — Physical and mechanical tests — Determination of cold crack temperature of surface coatings

1 Scope

This International Standard specifies a method for determining the cold crack temperature of surface coatings applied to leather. It is applicable to all leathers which have a surface coating and which can be easily flexed.

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*

3 Principle

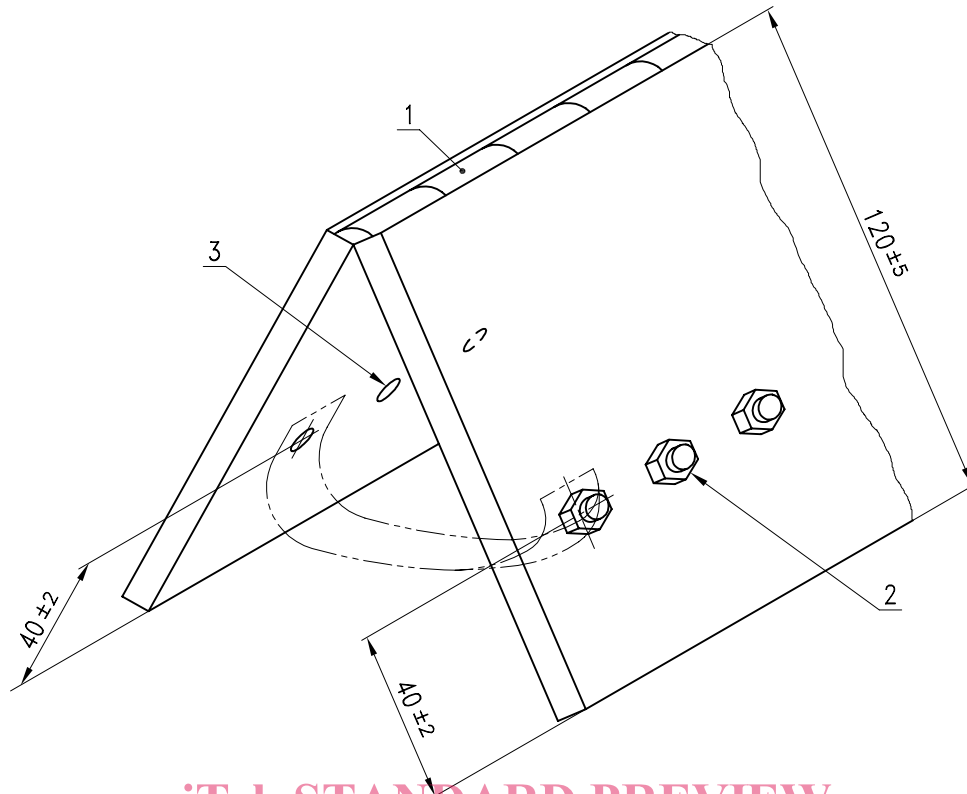
A strip of leather is held in a hinged apparatus in a cooled chamber at a given temperature. The hinged apparatus is closed rapidly causing the leather to be folded with the surface coating outwards. The leather is examined to determine if the surface coating has cracked.

4 Apparatus

4.1 Cooled chamber, minimum height 500 mm and minimum width and depth 300 mm fitted with a rack or other support with circulating air capable of maintaining temperatures between +5 °C and -30 °C and of controlling the temperature to ± 2 °C at any temperature within the range. The design of the chamber shall allow free circulation of air around the test piece and holder.

4.2 Temperature measuring device, readable to 1 °C and operating to at least -30 °C.

4.3 Hinged sample holder, of the type and dimensions shown in Figure 1. All fixings on the inside shall be flush to the inner surface so as not to present any obstruction when the sample holder is closed.



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- 1 Hinge
- 2 Securing nut
- 3 Countersunk bolt

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Figure 1 — Hinged sample holder (all dimensions are in millimetres)

4.4 Press knife, conforming to ISO 2419, capable of punching a rectangular test piece 90 mm ± 1 mm x 10 mm ± 1 mm with a circular hole of diameter 5,0 mm ± 0,5 mm, with the centre of the hole 6,0 mm ± 0,5 mm from each end, in a single operation. All parts of the press knife shall lie in the same plane.

4.5 Magnifier, with a magnification of 4 to 6 times.

5 Sampling and sample preparation

5.1 Sample in accordance with ISO 2418.

5.2 Cut test pieces by applying the press knife (4.4) to the grain surface with the long edge of the press knife parallel to the backbone. Cut eight test pieces from each sample, four parallel to, and four vertical to the backbone. If the backbone is not known then cut the two sets of four samples at right angles to each other.

NOTE 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 four pieces in each direction.

6 Procedure

6.1 Insert one test piece from each sample into the hinged sample holder with the surface coating facing towards the open end of the sample holder. Ensure as far as possible that all test pieces which are tested together are of similar thickness as thin test pieces will not be adequately flexed if tested with substantially thicker test pieces.

NOTE For practical reasons it is better not to carry out this test with just one test piece in the holder.

6.2 Place the hinged sample holder in the chamber, adjust the temperature of the cooled chamber (4.1) to $5\text{ °C} \pm 2\text{ °C}$ and allow to equilibrate for at least 10 min. Open the chamber and snap shut the hinged sample holder as rapidly as possible whilst still in the chamber. Remove from the chamber and examine the flexed arc of the test piece for the presence of cracks using the magnifier (4.5).

NOTE The cracks will normally be linear but with thin surface coatings can follow the grain pattern of the leather.

6.3 If the surface coating is undamaged replace the test piece with a fresh test piece. Repeat 6.2 at a temperature of $0\text{ °C} \pm 2\text{ °C}$.

6.4 If the surface coating remains undamaged repeat 6.3 at temperatures of $-5\text{ °C} \pm 2\text{ °C}$, $-10\text{ °C} \pm 2\text{ °C}$, $-15\text{ °C} \pm 2\text{ °C}$, $-20\text{ °C} \pm 2\text{ °C}$, $-25\text{ °C} \pm 2\text{ °C}$ and $-30\text{ °C} \pm 2\text{ °C}$ until the surface coating cracks. Record the actual temperature at which the surface coating cracks. If the surface coating does not crack when tested at -30 °C record a result of $< -30\text{ °C} \pm 2\text{ °C}$.

NOTE If the surface coating has fine cracks before testing (such as those due to dry milling) there can be no clear end point as it is difficult to distinguish cracks produced in the test from those present already.

7 Test report

The test report shall include the following:

- a) reference to this International Standard, i.e. ISO 17233:2002;
- b) the highest temperature at which the leather cracks;
- c) any deviation from the method specified in this International Standard;
- d) full details for identification of the sample and any deviations from ISO 2418 with respect to sampling.

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