INTERNATIONAL STANDARD

# ISO 17227

**IULTCS/IUP 35**

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# Leather — Physical and mechanical tests — Determination of dry heat resistance of leather

*Cuir — Essais physiques et mécaniques — Détermination de la résistance du cuir à la chaleur sèche*



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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 17227 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 35 originally titled “Heat resistance of industrial glove leather” and published in *J. Soc. Leather Tech. Chem.* **73**, p. 62, (1989) and declared an official method of the IULTCS in 1989. This updated version was published in *J. Soc. Leather Tech. Chem.* **84**, p. 373, (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.

# Leather — Physical and mechanical tests — Determination of dry heat resistance of leather

## 1 Scope

This International Standard specifies a method of determining the dry heat resistance of conditioned leathers. It is applicable to all 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*

## 3 Principle

A conditioned test piece is heated in an oven and the shrinkage determined and changes in flexibility are assessed manually.

## 4 Apparatus

**4.1** **Oven**, fitted with a central rack capable of maintaining temperatures of 150 °C ± 5 °C, 200 °C ± 5 °C and 250 °C ± 5 °C.

**4.2** **Vernier callipers**, reading to 0,1 mm.

**4.3** **Support**, for the test piece while it is being heated in the oven, to minimise contact with the oven rack, for example a wire grid or pipe-clay triangle.

**4.4** **Stop clock**, readable to 1 s.

**4.5** **Press knife**, the inner wall which is a square of side 100 mm ± 1 mm as specified in ISO 2419.

## 5 Sampling and sample preparation

**5.1** Sample in accordance with ISO 2418. From the sample, cut three test pieces for each of the conditions required by applying the press knife (4.5) to the grain surface, if distinguishable.

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

**5.2** Using an indelible marker, mark measurement reference points A, B, C and D on the test piece in the positions shown in Figure 1.

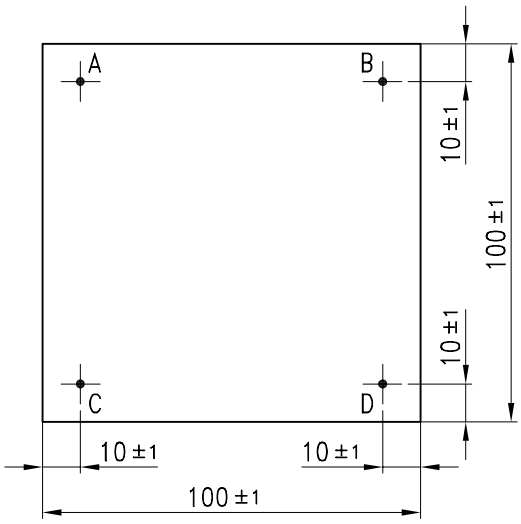


**Figure 1 — Location of measurement reference points on a test piece (all dimensions in millimetres ± 1mm)**

**5.3** Condition the test pieces in accordance with ISO 2419.

## 6 Test conditions

### 6.1 Oven temperature

The oven temperature should be selected from one of the following:

150 °C ± 5 °C

200 °C ± 5 °C

250 °C ± 5 °C

### 6.2 Test period

The test period should be selected from one of the following:

15 min ± 0,5 min

30 min ± 0,5 min

60 min ± 0,5 min

## 7 Procedure

**7.1** Using the vernier callipers (4.2), measure the distances AB and CD on each test piece to the nearest 0,1 mm and calculate the mean. Similarly measure the distances AC and BD and calculate the mean.

**7.2** Preheat the oven (4.1) to one of the temperatures given in 6.1. Place the test piece on the support (4.3) in the centre of the oven.

**7.3** After one of the test periods given in 6.2, remove the test piece from the oven and allow the test piece to cool.

**7.4** Repeat 7.2 and 7.3**,** using other test temperatures and periods as required, using a fresh test piece for each additional test.

**7.5** Recondition the test pieces for 48 h in accordance with ISO 2419.

**7.6** Using the vernier callipers (4.2), re-measure the distance AB, CD, AC and BD and calculate the mean as in 7.1.

NOTE 1 A dry heat stability test at 250 °C is an extremely stringent test on an organic material such as leather. Great care should be exercised in performing this test at 250 °C as it can cause the leather to smoulder. This risk is higher for leathers with a high content of oils and fats.

NOTE 2 Leather can give off fumes when heated under the conditions in 6.1 and 6.2. The test should only be carried out in a well ventilated area to protect operators from the effect of the fumes.

**7.7** Note any visual changes in the test piece, such as distortion or charring and assess any changes in flexibility manually.

## 8 Expression of results

**8.1** Calculate the original area, $A_1$, bounded by the points ABCD on the test piece, as follows:

$$A_1 = \frac{a_1 + c_1}{2} \times \frac{b_1 + d_1}{2} \quad (1)$$

where

$a_1$, $b_1$, $c_1$, $d_1$ are respectively the values of the dimensions AB, BD, CD, AC (see Figure 1), measured before the test.

Calculate the area after test, $A_2$, bounded by the points ABCD on the test piece, as follows:

$$A_2 = \frac{a_2 + c_2}{2} \times \frac{b_2 + d_2}{2} \quad (2)$$

where

$a_2$, $b_2$, $c_2$, $d_2$ are respectively the values of the dimensions AB, BD, CD, AC (see Figure 1), measured after the test.

Calculate the percentage loss of area (shrinkage) $S$, using the equation:

$$S = \frac{A_1 - A_2}{A_1} \times 100 \quad (3)$$

where

$A_1$ is the original area, calculated from (1);

$A_2$ is the area after test, calculated from (2).

**8.2** Record any visual changes in the test piece, such as distortion or charring.

**8.3** Record any changes in the flexibility of the test piece, assessed manually.

## 9 Test report

The test report shall include the following:

a) reference to this International Standard, i.e. ISO 17227:2002;

b) the test conditions;

c) the percentage loss in area of each test piece, as calculated in 8.1;

d) details of any visual changes or changes in flexibility;

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

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

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