

INTERNATIONAL
STANDARD

ISO
3377-1

IULTCS/IUP
40

First edition
2002-12-15

**Leather — Physical and mechanical
tests — Determination of tear load —**

**Part 1:
Single edge tear**

*Cuir — Essais physiques et mécaniques — Détermination de la force
de déchirement*
Partie 1: Déchirement d'un seul bord

ISO 3377-1:2002

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Reference number
ISO 3377-1:2002(E)
IULTCS/IUP 40

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Published in Switzerland

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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 3377-1 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 40 which was published in *J. Soc. Leather Tech. Chem.* 84, p. 385, (2000) and confirmed as an official method in March 2001.

Together with part 2 (see below), this part of ISO 3377 cancels and replaces ISO 3377:1975, which has been technically revised.

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ISO 3377 consists of the following parts, under the general title *Leather — Physical and mechanical tests — Determination of tear load*:

- *Part 1: Single edge tear*
- *Part 2: Double edge tear*

Leather — Physical and mechanical tests — Determination of tear load —

Part 1: Single edge tear

1 Scope

This part of ISO 3377 specifies a method for determining the tear strength of leather using a single edged tear. The method is sometimes described as a trouser tear. It is applicable to all types 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 2589 *Leather - Physical and mechanical tests - Determination of thickness*
- ISO 7500-1 *Metallic materials – Verification of static uniaxial testing machines – Part 1: Tension/compression testing machines – Verification and calibration of the force-measuring system*

3 Principle

A rectangular test specimen partially slit from one short edge is pulled so that a tear is propagated from the end of the slit. The mean force exerted during separation of the test piece is recorded.

4 Apparatus

4.1 Tensile testing machine, with:

- a force range appropriate to the specimen under test;
- a means of recording the force to an accuracy of at least 2 % as specified by Class 2 of ISO 7500-1;
- a uniform speed of separation of the jaws of 100 mm/min \pm 20 mm/min;
- a means of recording the force - e.g. as an extension curve;
- jaws, minimum width 50 mm \pm 2 mm.

4.2 Thickness gauge, as specified in ISO 2589.

4.3 Press knife, as specified in ISO 2419, capable of cutting a test piece as shown in figure 1 in one operation. All parts of the press knife shall lie in the same plane.

(all dimensions in millimetres ± 1 mm)

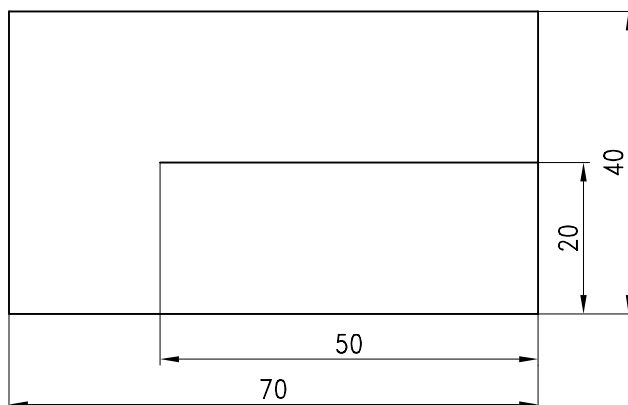


Figure 1 — Test piece for single edge tear

5 Sampling and sample preparation

5.1 Sample in accordance with ISO 2418. From the sample, cut 6 test pieces in accordance with ISO 2419, 3 test pieces with the longer sides parallel to the backbone and 3 test pieces with the longer sides perpendicular to the backbone.

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 three test pieces in each direction.

5.2 Condition the test pieces in accordance with ISO 2419.

5.3 Measure the thickness of the test pieces in accordance with ISO 2589.

6 Procedure

6.1 Set the jaws of the tensile testing machine (4.1) 50 mm apart.

6.2 Clamp approximately 20 mm of one leg of the test piece in the lower jaw of the tensile test machine. Fold the other leg through 180° and clamp in the upper jaw. Ensure that the long edges of the test piece are parallel to the direction of traverse of the machine.

6.3 Run the tensile test machine until the test piece is torn apart and record the force-extension plot.

6.4 To determine the arithmetic mean of the forces, divide the peak trace, beginning with the first peak and ending with the last peak, into four equal parts. The first and last parts shall not be used for the calculation of the mean value. From each of the two remaining subsections, select and note the two highest and two lowest peaks. A peak suitable for calculation is characterised by a 10 % minimum rising and falling of force.

6.5 For each test piece, calculate the arithmetic mean in Newtons of the peak values obtained according to 6.4. For electronic calculations, each individual peak will be analysed. Consequently the results may differ from the manual method.

6.6 Repeat 6.2 to 6.5 for other test pieces.

7 Test report

The test report shall include the following:

- a) reference to this part of ISO 3377, i.e. ISO 3377-1 : 2002;
- b) the thickness of the leather in mm;
- c) the mean tear load in Newtons (N) with the long edge of the test piece cut parallel to the backbone;
- d) the mean tear load in Newtons (N) with the long edge of the test piece cut perpendicular to the backbone;
- e) the average tear load (i.e., the arithmetic mean of c and d);
- f) 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);
- g) any deviations from the method specified in this part of ISO 3377;
- h) full details for identification of the sample and any deviations from ISO 2418 with respect to sampling.

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ICS 59.140.30

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