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**Leather — Physical and mechanical  
tests — Determination of tensile  
strength and percentage elongation**

*Cuir — Essais physiques et mécaniques — Détermination de la  
résistance à la traction et du pourcentage d'allongement*

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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see [www.iso.org/directives](http://www.iso.org/directives)).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see [www.iso.org/patents](http://www.iso.org/patents)).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

This document was prepared by the European Committee for Standardization (CEN) Technical Committee CEN/TC 289, *Leather*, the secretariat of which is held by UNI, in collaboration with the Physical Test Commission of the International Union of Leather Technologists and Chemists Societies (IUP Commission, IULTCS), in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

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.

This fourth edition cancels and replaces the third edition (ISO 3376:2011), which has been technically revised in 7.3.1 to allow a pre-load.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at [www.iso.org/members.html](http://www.iso.org/members.html).

# Leather — Physical and mechanical tests — Determination of tensile strength and percentage elongation

## 1 Scope

This document specifies a method for determining the tensile strength, elongation at a specified load and elongation at maximum force of leather. It is applicable to all types of leather.

## 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 — Calibration and verification of static uniaxial testing machines — Part 1: Tension/compression testing machines — Calibration and verification of the force-measuring system*

## 3 Terms and definitions

No terms and definitions are listed in this document.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at <https://www.iso.org/obp>

— IEC Electropedia: available at <http://www.electropedia.org/>

## 4 Principle

A test piece is extended at a specified rate until the forces reach a predetermined value or until the test piece breaks.

## 5 Apparatus

### 5.1 Tensile testing machine, with:

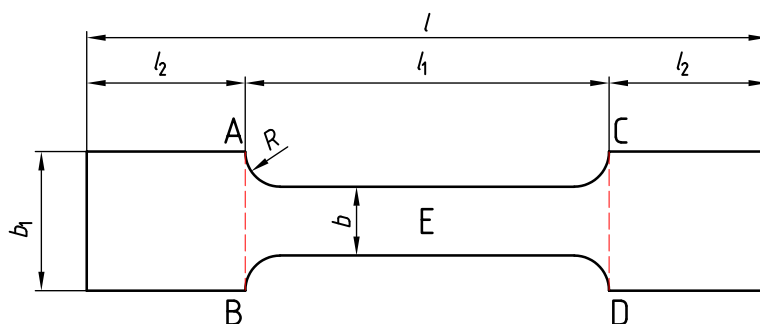
- a force range appropriate to the specimen under test;
- a means of recording the force to an accuracy of at least 2 % as specified by Class 2 of ISO 7500-1;
- a uniform speed of separation of the jaws of 100 mm/min  $\pm$  20 mm/min;
- a means of recording the force, for example as an elongation curve;
- jaws, minimum length of 45 mm in the direction of the applied load, designed to apply constant clamping by mechanical or pneumatic means. The texture and design of the inside faces of the jaws

shall be such that, at the maximum load attained in the test, the specimen does not slip in either jaw by an amount exceeding 1 % of the original jaw separation.

**5.2 A means of determining the elongation of the test piece**, either by monitoring the separation of the jaws or by sensors which monitor the separation of two fixed points on the test piece.

**5.3 Thickness gauge**, as specified in ISO 2589.

**5.4 Press knives**, as specified in ISO 2419, capable of cutting a standard or large size test piece as shown in [Figure 1](#) to the dimensions given in [Table 1](#).



**Key**

AB and CD upper and lower clamping position, respectively

E mid-point

$l$  length of each section

$b$  width of each section

**Figure 1 — Shape of test piece**

**Table 1 — Dimensions of test pieces**

Dimensions in millimetres

Test piece size	$l$	$l_1$	$l_2$	$b$	$b_1$	$R$
Standard	110	50	30	10	20	5
Large <sup>a</sup>	190	100	45	20	40	10

<sup>a</sup> The standard size should be used; however, if slippage ([7.5](#)) cannot be prevented by appropriate means, the large test piece should be used.

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

## 6 Sampling and sample preparation

**6.1** Sample in accordance with ISO 2418.

**6.2** After conditioning in accordance with ISO 2419, cut six test pieces from the sample by applying a press knife ([5.4](#)) to the grain surface, three test pieces with the longer sides parallel to the backbone and three test pieces with the longer sides perpendicular to the backbone. If previous testing has shown that there is slippage of the test piece in the jaws, use the large press knife ([5.4](#)).

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.