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**Leather — Physical and mechanical  
tests — Determination of flex resistance  
by the vamp flex method**

*Cuir — Essais physiques et mécaniques — Détermination de la  
résistance à la flexion à l'aide de la méthode de flexion d'empeigne*



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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 22288 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. It was published as EN 13335. It is based on IUP 39 published in *J. Soc. Leather Tech. Chem.*, **84** (7), p. 381, 2000, and declared an official method of the IULTCS in March 2001.

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.

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# Leather — Physical and mechanical tests — Determination of flex resistance by the vamp flex method

## 1 Scope

This International Standard specifies a method for determining the wet or dry flex resistance of leather and finishes applied to leather. It is applicable to all types of leather below 3,0 mm in thickness.

## 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 3696, *Water for analytical laboratory use — Specification and test methods*

## 3 Principle

A test piece is folded grain outwards over two inverted “V” shaped clamps. Relative movement of the clamps flexes the sample producing one downward crease surrounded by four upward creases. The test piece is examined periodically for damage.

## 4 Apparatus

**4.1 Test machine**, including the parts described in 4.1.1 to 4.1.3 and the crease patterns formed by flexing as shown in Figure 1.

**4.1.1 A pair of inverted “V” shaped blocks and clamps**, with the axis mounted in a straight line with an angle of  $40^\circ \pm 1^\circ$  and a tip radius of  $6,4 \text{ mm} \pm 0,5 \text{ mm}$  and with a minimum distance between the clamps of  $9,5 \text{ mm} \pm 1,0 \text{ mm}$ .

**4.1.2 A means of applying a simple harmonic reciprocating motion to the clamps**, to move them apart by  $19,0 \text{ mm} \pm 1,5 \text{ mm}$  and return them to the minimum separation at a rate of oscillation of  $300 \text{ cycles/min} \pm 30 \text{ cycles/min}$ .

**4.1.3 Counter**, to indicate the number of cycles.