SLOVENSKI STANDARD
oSIST prEN ISO 19076:2022

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Usnje - Merjenje usnjene površine - Elektronske tehnike (ISO/DIS 19076:2022)

Leather - Measurement of leather surface - Electronic techniques (ISO/DIS 19076:2022)

Leder - Messung der Oberfläche des Leders - Elektronische Verfahren (ISO/DIS 19076:2022)

Cuir - Mesurage de la surface du cuir - Techniques électroniques (ISO/DIS 19076:2022)

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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).

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).

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.

This document was prepared by the Fastness Test Commission of the International Union of Leather Technologists and Chemists Societies (IUF 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 co-operation 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 second edition cancels and replaces the first edition (ISO 19076:2016), which has been technically revised as follows:

— the Scope and clauses 3, 4, 5, 6, 7, 8, 9 and Annex A have been editorially and technically modified;

— a new Annex E for pickled and wet leather conditioning before testing has been inserted.

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.

Introduction

Leather surface measuring equipment used within the European Union (EU) for legal metrology applications are also subject to the EU Directive 2014/32/EU “on the harmonisation of the laws of the Member States relating to the making available on the market of measuring instruments (recast)” [1], on measuring instruments.

Leather — Measurement of leather surface — Electronic techniques

1 Scope

This International Standard provides a method for the measurement of the surface of leather or leather parts by the use of electronic measuring machines.

It applies to the measurement of leather (or leather parts) fulfilling the following requirements:

— flexible leather, finished or unfinished dry leather;

— flexible wet leathers (Annex E);

— flexibility: such to allow full distension on the measuring line/surface.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 2419, *Leather — Physical and mechanical tests — Sample preparation and conditioning*

EN 15987, *Leather — Terminology — Key definitions for the leather trade*

3 Terms and definitions

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 https://www.electropedia.org/

For the purposes of this document, the terms and definitions given in EN 15987 and the following apply.

3.1
longitudinal advancement sensing system
in measuring machines type with linear sensor array a feeding movement sensing system to detect the longitudinal advancement of the leather with respect to the linear sensor array

3.2
measuring line
in measuring machines type with linear sensor array is the physical line where the leather presence is detected by the sensor array

3.3
relative feed
in non-static measuring machines movement of relative translation between leather and the system detecting its presence

3.4
Testing
operations of setting and assessment of metrological compliance of the device (calibration)

4 Principle

The leather surface is measured by means of a measuring system provided with a linear or a two-dimensional array of uniformly-spaced opto-electronic sensors capable to detect leather presence.

There are two operating principles of sensors: the first based on the presence of an object between the beam of a source and a receiver, the second based on the image captured by a digital camera.

In both cases the digital data signals are processed by a computer to generate elementary surface units that contribute to calculate the surface of the sample. The calculation can be displayed, saved or printed. The leather surface measure is displayed in metric units, having a scale interval of 1 dm^2. For testing purpose, a scale interval shall be at least of 0,1 dm^2. For other unit of measurement, a suitable conversion factor shall be used.

5 Apparatus and materials

5.1 Measuring machines

The measuring machines are currently built and classified in some basic types, in relation to the different solutions adopted for the sensor array and for the relative feed.

Measuring machines types with linear sensor array:

— Type A Roller measuring machines: with transport roller (Type A1) and with transport conveyor (Type A2),

— Type B Conveyor measuring machines: standard conveyor machine (Type B1) and vacuum conveyor machine (Type B2),

— Type C Flatbed scanning machines

Measuring machines types with two-dimensional sensor array:

— Type D Type D

5.1.1 Measuring machines type with linear sensor array (Type A, B, and C)

These measuring machines consists at least of:

— a base frame;

— a relative feed-system between leather and measuring system;

— a set of sensors (sensor array) uniformly spaced along a direction normal to the feeding movement, to detect leather presence;

— a longitudinal advancement sensing system;

— a numerical indicator (display) of the leather surface measure, in metric units, having a scale interval of 1 dm^2. For testing purpose, a scale interval shall be at least of 0,1 dm^2.

As an option, the machine may be equipped with a stamping or printing system to record the surface measured value onto leather or onto a label or paper. The distance *i* between two adjacent sensors for the detection of leather presence shall not be greater than 27 mm across the feeding direction.

The length of the measuring line defines the detecting width of the machine and shall be indicated in the test report.

The distance *i* between two adjacent detection points of the measuring line shall not be greater than 25+1 (27) mm and shall be uniform on all the declared useful working (detecting) width of the machine.

Let *p* be the step of the leather presence detection along the feeding direction: the values of *i* and *p* shall be such that their product $i \times p$ is not greater than 1/400 of the minimum measurable surface.

The feeding speed shall allow leather to spread out adequately during measurement. If necessary, the machine is equipped with a feeding speed adjustment device to aid the fulfilment of this condition.

5.1.2 Type A roller measuring machine

In this type of machine there is a coincidence between the elements that make up the feeding system and the optical detection system.

A horizontal introduction bench is present before the feeding system to facilitate the hide feeding of the machine by the operator, and the feeding system is composed by two main sections, one section above and one section below the introduction plane.

The section above is composed by one set of transparent free running rollers of equal width, each one including a sub-array of opto-electronic devices (emitters or sensors) and one encoder that detect the roller rotation, giving the roller the independent ability to detect the longitudinal advancement of the leather for the underlying portion; all the encoders of all the measuring rollers make up the longitudinal advancement sensing system.

The section below is composed by one transport system that incorporates one array of uniformly spaced opto-electronic devices (sensors or emitters), working in axis with the opto-electronic devices inside the above measuring rollers and making up with them the optical detection system.

The points where the two sections come into contact locate the measuring line of the machine.

5.1.3 Roller measuring machine with transport roller (Type A1)

In this type of measuring machine the transport system consist of one motorized roller that incorporates the opto-electronic devices that define the measuring line and the introduction bench is placed just before the measuring line. This means that the sensor array is incorporated into the feeding system, being the set of free-rotating measuring rollers also part of the feeding system itself.

Once the hide has been inserted between the measuring rollers and the transport system, the same continues (autonomously) as a result of the friction generated by the light pressure of the rollers on the hide (skin, leather). The feeding speed can affect the spread out of the leather.

The movement of leathers under the rollers is controlled by their (relative) encoders that are independent from each other.

During the feeding, leathers can be spread laterally (perpendicularly to feeding direction), slowed down or stopped on the introduction bench by the operator.

If the machine allows temporary feeding stop during measurement (e.g. by manual holding), this shall not significantly alter the measuring value.

Any feeding inversion, even partial and/or temporary, shall automatically cancel the measure, unless the measuring system allows for the inversion in the area calculation. Such information shall be checked in the instruction manual provided by the machine manufacturer.

5.1.4 Roller measuring machine with transport conveyor (Type A2)

In this type of measuring machine the introduction bench consist of a transport conveyor with (transparent) belts that incorporates the opto-electronic sensors and that define the measuring line.

This machine is generally used for measurement of area before or after mechanical operations (e.g. roller press) in the tanning process. It shall not be used for the verification of surface between seller and customer.