ETHIOPIAN STANDARD

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Guide line for measurement of area of leather

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Foreword

This Ethiopian Standard has been prepared under the direction of Technical Committee for Leather and Leather products(TC 74) and published by the Ethiopian Standards Agency (ESA).

In preparing this Ethiopian Standard reference has been made to the following:
IS 14487:1997, “code of practice for flaying of hides and skins ", published by the Bureau of Indian standards.
Acknowledgement is made for the use of information from the above publication.

Guide line for measurement of area of leather

1. Scope

This standard prescribes a method of measuring the area of pieces of leather. It is intended only for the measurement of dressed and other dry flexible leathers with the help of a pin-wheel machine.

2. Normative References

The Ethiopian Standard listed below contains provisions which through reference in this text, constitute provision of this Ethiopian Standard. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this Ethiopian Standard are encouraged to investigate the possibility of applying the most recent edition of the Ethiopian Standard indicated below

ES ISO 11646, Leather -Measurement of area

ES ISO 2419, Leather- Physical and Mechanical Tests- Sample Preparation and Conditioning

3. Principle

The area of the conditioned leather is measured with a mechanical pin-wheel machine.

4. Apparatus

4.1. Mechanical Pin-Wheel Area-Measurement Machine

The machine used should preferably have a feed roller speed of 20 + /- 2 m /min. The distance between the centres of the pins on two adjacent pin wheels should preferably be 25.4 +/- 2.5 mm, when measured parallel to the axis of the pin-wheel roller. Pinwheel machines which do not conform to these recommendations may also be used, but the actual design values shall be stated in the test report.

4.2. Circular Calibration Templet

The templet shall be made of flexible reinforced material, for calibrating the pin-wheel machine immediately before the machine is used. The area of the templet shall not be less than 5 percent of the pin-wheel machine capacity, and the width of the templet shall not be greater than 50 percent of the machine's working width.

The area of the template shall, if possible, be within +/- 50 percent of the anticipated area of the piece of leather to be measured. If this is not possible, feed the same template through the machine a number of times (N) without resetting the machine to zero until the total reading is within +/- 50 percent of the anticipated test-specimen area and this total is treated as a single measurement. When not in use, the template(s) shall be kept flat in the standard atmosphere defined in ES ISO 2419.

The area of the template(s) shall be verified at least once a year by an independent body using measurement instruments traceable to the national standard calibration procedure. The template is acceptable if its measured area is within +/- 0.5 percent of its nominal area.

4.3. Calibration Procedure

Before each series of test carry out the following procedure

4.3.1. Switch on and run the machine for at least 2 min, then pass an 'old' (that is, uncertified) template through the machine approximately 25 times in a random manner to ensure that all wheels are engaged. Some of the passes shall be cumulative, without resetting the machine to zero, in order to ensure that, all moving parts of the machine are running freely.

4.3.2. Set the zero of the machines and pass a certified template through the machine N times without cancelling the individual readings. Ensure that all pin wheels which will be actuated by the subsequent pass of the leather test specimen have also been actuated by the template. If the recorded total area is within +/- 0.01 m^2 of the theoretical total area, proceed to the next stage. If it is beyond this range adjust the machine and repeat the N passes until the recorded area is within the prescribed tolerance

4.3.3. Once the machine measures to within the prescribed tolerance, zero the measurement gauge and repeat twice the procedure described in 4.3.2. Record all three total areas to the nearest 0.01 m^2.

4.3.4. If all three total areas are higher or lower than N times the theoretical template area, or if the difference between the maximum and minimum total area is greater than 0.02 m^2, repeat the calibration procedure from the beginning of 4.3.2 after making appropriate adjustments to the machine.

5. Procedure

5.1. Conditioning of the Leather

5.1.1. Unless otherwise agreed (see 4.1.2.) expose the leather test specimen to the standard atmosphere defined in ES ISO 2419 (27+/- 2^0C and 65 +/- 5 percent relative humidity) for at least 48 h.

5.1.2. For some purposes, it is unnecessary to subject test specimens to a strict conditioning procedure, and measurements may be carried out on leather which has not been conditioned, or has been conditioned in a way other than that specified in ES ISO 2419. Whenever conditions other than those specified in 5.1.1 are used, the conditioning regime shall be stated-in the test report as a deviation from the method.

5.1.3. Support the leather if possible along the backbone in such a way that air has free access to both surfaces, and keep the air in continuous motion by means of a suitably placed fan.

5.1.4. Note the time of conditioning in hours.

5.2. Start of Measurement

Carry out the test either in the same atmosphere as used for conditioning or in ambient conditions but within 30 min of removing the test specimen from the conditioning atmosphere. Before each measurement, set the pointer of the measurement gauge to zero.

5.3. Method of Measurement

Feed the test specimen into the machine with the higher friction surface in contact with the pinwheels. The specimen shall be absolutely flat and without creases at the moment when it passes between the pin-wheels and the top of the feed-roller.

In the case of soft leathers, this smoothing may involve pulling the hide from edge to edge with sufficient force to prevent the pins pushing the leather into the transport feed-roller slots, the specimen being held in such a manner that it remains flat as it passes through the machine. To ensure this, more than one operator may be needed to feed the specimen into the machine.

5.4. If the specimen has a linear or nearly linear edge

If the specimen has a linear or nearly linear edge, for example, along the sides, it shall be fed through the machine so that the straight edge forms an angle of about 30' to the direction of movement. In any other case, the line of the backbone shall be perpendicular, or almost so, to the axis of the rollers.

5.5. If the area of the test specimen is more than 5 percent of the measurement-machine capacity

If the area of the test specimen is more than 5 percent of the measurement-machine capacity, measure the area twice. If the readings differ, repeat the minimum number of times required to obtain two equal readings after rounding to the nearest 0.01 m^2. If the pointer is exactly in the middle between two scale divisions, round the reading up to the higher of the two divisions.

5.6. If the area of the test specimen is less than 5 percent of the measurement-machine capacity

If the area of the test specimen is less than 5 percent of the measurement-machine capacity, feed the specimen through the machine repeatedly without zeroing in between until the total measured area exceeds 5 percent of the measurement- machine capacity. Repeat the sequence of measurements to obtain a second reading. If the first reading differs from the second after rounding to the nearest 0.01ft^2/m^2, repeat the sequence to the minimum number of times required to obtain two equal readings. Calculate the area of the specimen as the total measured area divided by the number of times the specimen was fed through the machine and then round to the nearest 0.01ft^2/ m^2.

6. Expression of results

Report the area of the test specimen as the average of two valid measurements in m^2, rounded to two places of decimals.

7. Test report

The test report shall include the following information:

a) A description of type of leather tested;

b) A reference to this standard;

c) The time of conditioning in hours;

d) The result of the area measurement in m^2, rounded to 2 places of decimals; and

e) Details of any deviations from the procedure

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Ethiopian Standards Agency

Organization and Objectives

The Ethiopian Standards Agency (ESA) is the national standards body of Ethiopia established in 2010 based on regulation No. 193/2010.ESA is established due to the restructuring of Quality and Standards Authority of Ethiopia (QSAE) which was established in 1998.

ESA's objectives are:-

- ❖ Develop Ethiopian standards and establish a system that enable to check whether goods and services are in compliance with the required standards,
- ❖ Facilitat the country's technology transfer through the use of standards,
- ❖ Develop national standards for local products and services so as to make them competitive in the international market.

Ethiopian Standards

The Ethiopian Standards are developed by national technical committees which are composed of different stakeholders consisting of educational institutions, research institutes, government organizations, certification, inspection, and testing organizations, regulatory bodies, consumer association etc. The requirements and/ or recommendations contained in Ethiopian Standards are consensus based that reflects the interest of the TC representatives and also of comments received from the public and other sources. Ethiopian Standards are approved by the National Standardization Council and are kept under continuous review after publication and updated regularly to take account of latest scientific and technological changes. Orders for all Ethiopian Standards, International Standard and ASTM standards, including electronic versions, should be addressed to the Documentation and Publication Team at the Head office and Branch (Liaisons) offices. A catalogue of Ethiopian Standards is also available freely and can be accessed in from our website.

International Involvement

ESA, representing Ethiopia, is a member of the International Organization for Standardization (ISO), and Codex Alimentarius Commission (CODEX). It also maintains close working relations with the international Electro-technical Commission (IEC) and American Society for Testing and Materials (ASTM).It is a founding member of the African Regional Organization for standardization (ARSO).

<u>More Information</u>?
Contact us at the following address.
The Head Office of ESA is at Addis Ababa.

☎ *011- 646 06 85, 011- 646 05 65*
🖷 *011-646 08 80*
✉ *2310 Addis Ababa, Ethiopia*
E-mail: info@ethiostandards.org,
Website: www.ethiostandards.org

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