# ETHIOPIAN STANDARD

# ES 6816:2021

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# Specification for pickled sheep and goat pelt

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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 5570:1987, “Specification for pickled sheep and goat pelt ", published by the Bureau of Indian standards.
Acknowledgement is made for the use of information from the above publication.

# Specification for pickled sheep and goat pelt

## 1. Scope

This Ethiopian standard specifies the requirements for pickled sheep and goat pelt.

## 2. Normative reference

The following referenced documents are indispensable for the application of this Ethiopian standard. Only the latest edition of the documents (including any amendments) shall be applicable.

ES 1180, Leather – Terminology

CES 11, Grading of raw and pickled sheep and goat skins by defect and size

## 3. Terminology

For the purpose of this standard, the definitions given in ES 1180 shall apply.

## 4. Requirements

**4.1. Raw Material** - The material shall be dry, wet-salted or green pelt.

**4.1.1.** The sizes of the pelts shall be as agreed to between the purchaser and the supplier.

**4.2. Processing** – the process brings about conditions unfavorable for putrefaction by introducing high salt concentration and high hydrogen ion concentration. This renders pickled pelts suitable for storage and transshipment. Further, pickled pelts are amenable for smooth and scientifically controlled tanning operation.

**4.2.1.** The skins shall be adequately treated with fungicide or combination of fungicides which are effective and which do not cause health hazard so as to inhibit mould growth or spore germination and swelling over a period of 48 hours when tested according to the method given in

**4.3. Appearance** - The pelt shall have clean flesh side and the grain shall be smooth, free from visible indication of swelling.

**4.4.** The material shall comply with the requirements given in Table 1.

**TABLE 1 Requirement of pickled goat and sheep pelt**

| R.No | Characteristics | Requirement | method of test (ref to cl no. in appendix A) |
|---|---|---|---|
| 1 | Moisture content, percent by mass | As agreed, to between the purchaser and the supplier | A-3 |
| 2 | Salt content (as NaCl), percent by mass, Min | 0.30 | A-4 |
| 3 | Acid content (as $H_2SO_4$), percent mass, Min | 15 | A-5 |
| 4 | Soluble hide substance, percent by mass | As agreed, to between the purchaser and the supplier | A-6 |
| 5 | Hide substance, percent by mass, Min | 70 | A-7 |
| 6 | pH of aqueous extract, Max | 3.0 | A-8 |
| 7 | Shrinkage temperature, Min | $50^0$C | A-9 |

### 4.5. Grading of pickled sheep and goat pelt

Physical and chemical requirements of pickled sheep and goat pelt

Pickled sheep and goat pelt shall be graded according to the physical appearance and size.

### 4.6. Identification of major and minor defects:

**Major defects**: Ekek, hole putrefaction, pox, poor pattern, wound/sears, deep knife cut damage, old animal skins, poor substance, process defects are among others.

**Minor defects**: Such as scratch, blood stains, gouge mark, wrinkles, pinhole, heat damage, veniness, blood stain and process defects.

**Table 2- Physical requirements for grading of pickled sheep pelt by defect on appearance.**

| Grade | Useable area by % of total area | Description |
|---|---|---|
| I | 85-100 | One minor defect on the skin surface which is likely to depreciate the skin appearing beyond 2.5 cm from the edges. |
| II | 70-84 | pelt will have not more than three minor defects on the skin surface appearing beyond 2.5 cm from the edges which are likely depreciate the pelt. |
| III | 55-69 | pelt will have not more than three minor defects and one major defect on the skin which are likely depreciate the skin. |
| IV | 40-54 | pelt will have not more than five minor defects on the skin which are likely depreciate the pelt |
| V | 25-39 | pelt will have not more than 10 minor defects and two major defects on the skin which are likely depreciate the pelt |
| VI | 15-24 | pelt will have not more than 15 minor defects and two major defects on the skin which are likely depreciate the pelt |
| Reject | Less than 15 | pelt will have major defects throughout the skin surface appearing beyond 2.5 cm which are likely to depreciate the pelt. |

**Table 3 - Physical requirements for grading of pickled goat pelt by defect on appearance.**

| Grade | Useable area by % of total area | Description |
|---|---|---|
| I | 85-100 | These pelts will have good substance suitable for good finish. Grain should be free from open defects and heavy pox marks which could show on flesh side. The suede side should have no prominent veins and flay cuts, which could affect the nap. The buff portion of the pelt should have no flay cuts. |
| II | 70-84 | These pelts should have even substance and grain side could have course and small scratch marks and on suede side small or very light vein marks which will no affect the nap. Still on suede side it could have one or two light flay cuts on the peripheries of the pelt |
| III | 55-69 | Pelt these pelts even substance and grain side could be open scratches and pox marks which could show upon suede side. On suede side skin could how flay cuts not very deep and vein marks not so prominent and too many not to affect the cutting value. |

| | | |
|---|---|---|
| IV | 40-54 | These pelts will have varied substance and similar skin defect as in Grade III but with this cutting value |
| V | 25-39 | These pelts will have pronounced pox marks, open defects gash and scratches having on grain and flesh. |
| VI | 15-24 | pelt will have not more than 15 minor defects and two major defects on the skin which are likely depreciate the pelt |
| Reject | Less than 15 | Pelt will have major defects throughout the skin surface appearing beyond 2.5 cm which are likely to depreciate the pelt. |

**Table 4: Classification of pickled sheep and goat skins by size**

| Origin of skin | Category by size | Skin dm2 per skin | Size in ft2 per pelt |
|---|---|---|---|
| Sheep and goat | Extra small | Less than 23 | Less than 2.5 |
| | Small | 23-32 | 2.5 – 3.5 |
| | Medium | 33-42 | 3.6 – 4.5 |
| | Large | 43-51 | 4.6- 5.5 |
| | Extra large | above 51 | above 5.5 |

## 5. Packing and Marking

**5.1. Packing** - The pickled goat and sheep pelt shall be packed in bags made from polyethylene film/sheets of thickness 0.03 to 0'04 mm after sprinkling powdered common salt within them.

**5.2. Marking** - Each pac king s hall b e c learly m arked w ith m ass i n kg; nu mber of s kins i n eac h pac king; recognized trade-mark, if any; and. month and year of manufacture.

NOTE 1 -The requirements for various characteristics are given for those pickled pelts that are not stored for periods longer than six months under normal conditions.

NOTE 2 - Hydrolysis of hide substance takes place during transit owing to temperature and other conditions. It would, t herefore, b e nec essary t hat s oluble pr otein det ermination s hould b e c arried o ut o n go ods af ter reaching t heir des tination. F or s ix months s torage under nor mal c onditions, t he s oluble pr otein s hould n ot exceed one percent by mass.

# Annex A

# (Table 1)

# Test methods

**A-I. Quality of Reagents**

**A-I.1** Unless specified otherwise, pure chemicals and distilled water shall be employed in tests.

NOTE - 'Pure chemicals' shall mean chemicals that do not contain impurities which affect the results of analysis.

**A-2. Preparation of sample for test**

**A-2.1** The sample shall consist of six pieces, approximately 100 X 100 mm, cut from different pelts (thirds are suitable). The samples shall be cut from the butt area, free from gross fat and flesh, 50 mm above the tail and shall be securely sealed in polyethylene bags for dispatch. For shrinkage temperature, other areas of pelt may be sampled and should be clearly marked.

**A-2.2** Cut equal portions of the pelt pieces ( size approximately 6 X 6 mm ) to make a composite sample of approximately 50 g. Hand squeeze lightly the residue of pelt pieces to obtain at least 10 ml expressed liquor. Squeezed pieces may be used for physical tests and shrinkage temperature determination.

**A-3. Determination of moisture content**

**A-3.1 Outline of the Method** - A specified amount of pickled pelt is mixed with toluene and the moisture along with toluene is distilled off and collected in the receiver or trap. Toluene being lighter fraction separates out at the top and from the graduated scale, volume of moisture is determined. Finally the percentage of moisture is calculated by reckoning it back to the actual amount of pickled pelt taken for the determination.

**A-3.2 Apparatus**

**A-3.2.1** Assembly - The assembly of the apparatus consists of a glass flask heated by suitable means and provided with a reflux condenser discharging into a trap and connected to the flask. The connections between the trap, condenser and flask should be of interchangeable

ground glass joints (see IS: 5165-1969*). The trap and measure the condensed water, and to return flask. The assembly of the apparatus is shown in Fig. components are described in A-3.2.1.1 to A-3.2.1.4.

**A-3.2.1.1** Flask - A 500 ml flask of the shape shown in Fig. 1, made of hard alkali resistant glass, well annealed and as far as possible free from striae and similar defects.

**A-3.2.1.2** Condenser - A water cooled glass reflux condenser having a jacket approximately 400 mm long and an inner tube of 9'5 to 12'7 mm outside diameter. The tip of the condenser to be inserted in the trap may be ground off at the angle of 30" from the vertical axis of the condenser. When inserted into the trap, the tip of the condenser shall be 6 to 7 mm above the surface of the liquid in the trap after distillation conditions have been established.

**A-3.2.1.3** Receiver - Otherwise called the trap, made of hard alkali resistant glass, well annealed and as far as possible free from striae and similar defects, provided with ground glass joints, with the shape, dimensions and

tolerances as given in Fig. 1; consisting essentially of the upper chamber, together with the tube and ground joint leading to the flask, and the graduated tube. The graduated portion shall have a capacity of 5 ml when.filled to the highest graduation mark. The scale shall cover the range of 0 to 5 ml and shall be graduated at intervals of 0'1 ml. The graduation and marks corresponding to each millimetre shall be numbered and carried completely round the tube. The graduation marks midway between the numbered marks shall be carried three-quarters-way round the tube. The graduation marks capacity shall not exceed 0'05 ml.

**A-3.2.1.4** Heat source - The source of heat may be either an oil bath or an electric heater provided with a sliding rheostat or other means of heat control. The temperature of the oil in the bath should not be much higher than the boiling point of toluene,

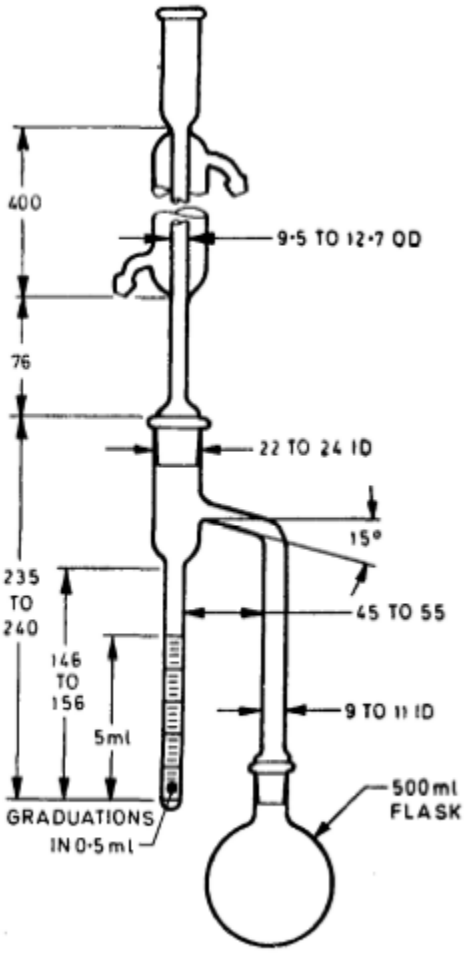
**A-3.2.2** Copper Wire - Long enough to extend through the condenser, with one end t wisted into a s piral. The diameter of the spiral should be such that it fits snugly within the graduated portion of the receiver and yet can be moved up and down.

**A-3.3 Reagents**

**A-3.3.1** Potassium Dichromate-Sulphuric Acid Cleaning Solution

**A-3.3.2** Toluene - Saturate the toluene by shaking with a small quantity of water and distil. Use the distillate for moisture deter- minations.

**A-3.4 Procedure** - Clean the entire apparatus with potassium dichro- mate-sulphuric acid cleaning solution to minimize the adherence of




All dimensions in millimetres.

FIG. 1 MOISTURE DISTILLATION APPARATUS

Water droplets to the sides of the condenser and the receiver. Rinse thoroughly with water and dry completely before using. The quantity of material taken for the test is determined by the amount of moisture present ( w/w ).

Normally 7 to 8 g of the pickled pelt cut into squares of about 3 mm is used. Place the required quantity of material, accu- rately weighed, in the distillation flask and add an equal volume of toluene, as desired but never less than 100 ml and swirl to mix. Assemble the apparatus and fill the receiver with the solvent by pouring it through the condenser until it begins to overflow into the distillation flask. Insert a loose cotton plug in the top of the condenser to prevent condensation of atmospheric moisture within the tube. In order that the refluxing may be under control, wrap the flask and tube leading to the receiver with asbestos cloth. Heat the flask so that the distillation rate is about 100 drops per minute. When the greater part of the water has distilled over, increase the distillation rate to about 200 drops per minute and continue until no more water is collected. Purge the reflux condenser occasionally during the distillation with 5 ml portions of toluene to wash down any moisture adhering to the walls of the condenser. The water in the receiver may be made to separate from the toluene by moving the spiral copper wire up and down in the condenser and receiver occasionally, thus causing the water to settle at the bottom of the receiver. Reflux until the water level in the receiver remains unchanged for 30 minutes and then shut off the source of heat. Flush the condenser with toluene, as required, making use of the spiral copper wire to discharge any moisture droplets. Immerse the receiver in water at about 27°C for at least 15 minutes or until the toluene layer is clear, and then read the volume of water.

**A-3.5 Calculation** - **Calculate the moisture content as follows:**

Moisture content, percent by mass = $\frac{VD}{M}$ X 100

where

V = volume in ml of water, D = specific gravity of water at the temperature at which the volume of water is read, and M = mass in g of the material taken for the test.

**A-3.5.1** The estimate shall be done in duplicate and shall not differ by more than two percent.

**A-4. Determination of acid content**

**A-4.1 Outline of the Method** - A known quantity of pelt is shaken with sodium chloride solution and the extracted solution is titrated against standard alkali. The acid content is then calculated in terms of sulphuric acid on moisture-free basis of the material.

**A-4.2 Reagents**

**A-4.2.1** Bromophenol Blue Indicator Solution - See IS : 2263-1979*.

**A-4.2.2** Sodium Chloride Solution - N/10.

**A-4.2.3** Sodium Hydroxide Solution – N/10.

**A-4.3 Apparatus**

**A-4.3.1** Mechanical Shaker

**A-4.3.2** Stoppered Flask

**A-5.4 Procedure** - Weigh 10 g of pelt cut to pieces and shake with 200 ml of sodium acetate solution in a stoppered flask for 2 hours. Filter the solution through Whatman filter paper No. 4 or equivalent. Titrate 25 ml aliquot from the filtrate with standard silver nitrate solution using potassium chromate as internal indicator.

**A-5.5 Calculation**

**A-5.5.1** Calculate the salt content ( as NaCl ) as follows: Salt content ( as NaCl >,

Percent by mass = 0’467 6 VN

Where

V = volume in ml of standard silver nitrate solution, and

N = normality of standard silver nitrate solution.

**A-5.6 Results** - Express the results in percent by mass on moisture- free basis of the material.

**A-6. Determination of soluble hide substance**

**A-6.1 Outline of the Method** - A known quantity of the pelt is shaken with sodium bicarbonate solution for a known period. The extract is then filtered. From the solution ammonia is liberated by the addition of excess of caustic soda, distilled into an absorbent solution and estimated by titration. From this, percentage of hide substance dissolved is calculated.

**A-6.2 Apparatus**

**A-6.2.1** Distillation Apparatus

**A-6.2.2** Kjeldahl Flask - 700 ml capacity.

**A-6.3 Reagents**

**A-6.3.1** Concentrated Sulphuric Acid - Relative density 1'84 ( conforming to IS : 266-1977* ). **A-6.3.2** Sodium Bicarbonate - approximately 0'1 N.

**A-6.3.3** Phenolphthalein Indicator - Dissolve 1 g of phenolphthalein in 100 ml of ethyl alcohol ( 50 percent by volume ).

**A-6.3.4** Sodium Hydroxide Solution - 35 percent ( w/v ).

**A-6.3.5** Saturated Solution of Borate-Free Boric Acid - Containing a suitable indicator, like 2 ml of a mixed indicator solution of 0'06 percent methyl red and 0'04 percent methylene blue in 96 percent ethyl alcohol in one liter.

**A-6.3.6** Standard Sulphuric Acid or Hydrochloric Acid- approximately 0'5 N.

**A-6.4** Procedure - Weigh 10 g of the pelt cut in pieces and extract with 500 ml of sodium bicarbonate solution for 24 hours with intermittent shaking in a flask. Filter, concentrate the filtrate to about 25 ml and transfer to a Kjeldahl flask. Digest the contents with sulphuric acid after adding copper sulphate and potassium sulphale. Pour excess of sodium hydroxide solution ( approximately 70 ml ) carefully down the side of the flask. Connect the flask with a vertical condenser by means of a tube bent twice preferably including a spray trap. Distil the ammonia with water vapour into a receiver of 300 to 400 ml capacity containing 100 ml of saturated boric acid and indicator solution. Dip the cooling tube into the boric acid. The distiJled ammonia colors the indicator green. Distil until there is 150 to 200 ml of distillate. Before ending the distillation, lower the receiver so that the cooling tube no longer dips in. Distil for further 3 minutes, rinse the end of the consider with distilled water. Titrate the ammonia with standard . hydrochloric acid to pH 4'6. When using the indicator, titrate to the first constant pale pink color ( see A-6.3.3 ).

NOTE - The end point of the titration is approximately pH 4'6. Potentiometric or other indicator system known to give an accurate colour change at pH 4.6 may also be used.

**A-6.5 Calculation** -Calculate the soluble hide substance as follows: Soluble hide substance, percent by mass = 1'573 6 VN where

V = volume in ml of standard acid, and

N = normality of standard acid used.

**A-6.6 Results** - Express the results in percent on moisture-free basis of the material.

**A-7. Determination of hide substance**

**A-7.1 Procedure** - Determine the hide substance in the material on moisture-free basis in accordance with the method given in LC: 5 of IS : 582-1970*.

**A-7.2 Results** - Express the results in percent by mass on moisture-free basis of the material.

**A-8. Determination of PH**

**A-8.1 Outline of the Method** - A known quantity of the pelt cut to pieces is shaken with a known quantity of sodium chloride solution for a known period and the pH of the decanted extract is determined electrometrically.

**A-8.2 Apparatus**

**A-8.2.1** Mechanical Shaker

**A-8.2.2** pH Meter - Mains or battery operated fitted with glass electrodes.

**A-8.3 Reagents**

**A-8.3.1** Sodium Chloride Solution - M/10.

**A-8.4 Procedure** - Shake 10 g of pelt cut to pieces and 100 ml of sodium chloride solution for 2 hours. Decant the extract and determine the pH to the nearest 0'05.

NOTE- The pH value of the aqueous extract of pickled pelt increases with time of storage and the increase is accelerated at elevated storage temperatures or if mould becomes established.

**A-9. Determination of shrinkage temperature**

**A-9.1 Outline of the Method** - Shrinkage temperature is determined in accordance with the method prescribed in LP: 10 of IS : 5914-1970" after neutralizing the acid in sodium acetate solution.

**A-9.2 Apparatus**

**A-9.2.1** Shrinkage Tester

**A-9.3 Reagents**

**A-9.3.1** Bromophenol Blue Indicator Solution - See IS : 2263-19797.

**A-9.3.2** Sodium Acetate Solution - M/5.

**A-9.4 Procedure** - Soak six test pieces, 50 X 50 mm, for 24 hours in 200 ml of sodium acetate solution. Cut a test piece and spot the cut section with bromophenol blue indicator solution. The cut section should not develop yellow. If the cut section shows yellow, soak the test pieces further in sodium acetate solution and until the acidity is neutralized. Determine the shrinkage temperature in sodium acetate solution in accordance with LP: 10 of IS : 5914-1970*. Raise the temperature at the rate of 2°C per minute and record the temperature at which shrinkage occurs to the nearest "C.

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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>?***
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