ETHIOPIAN STANDARD

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Leather goods – Industrial glove requirements

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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 2573:1986, “Leather-Vegetable tanned specification ", published by the Bureau of Indian standards.

Acknowledgement is made for the use of information from the above publication.

Leather goods – Industrial glove requirements

1. Scope

This standard prescribes the requirements of leather industrial glove for workers in the iron, steel, heavy industry and welders while handling moderately hot materials, or materials having rough and sharp edges, and during gas/electric welding, cutting and other heavy duties.

2. Normative References

ES 1180, Leather – terminology

ES ISO 4048, Leather — Chemical tests — Determination of matter soluble in dichloromethane and free fatty acid content

ES ISO 5398-1, Leather — Chemical determination of chromic oxide content — Part 1: Quantification by titration

ES ISO 4045, Leather - Chemical tests - Determination of pH

ES 1192, Leather - Determination of double hole stitch tear strength

ES ISO 3380, Leather - Physical and mechanical tests -Determination of shrinkage temperature up to 100 °C

ES 127, Yarns-determination of breaking load and elongation by single strand method

ES 3744, Specification for Industrial sewing threads made from linen (flax) or cotton

3. Terms and Defnition

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

3.1.
cuff
the extension of an industrial glove which covers the fingers and wrist.

3.2.
hand part
the palm including the index finger and the inner portions consisting of the second, third and fourth fingers.

4. Types

4.1. This standard covers two types of products, according to use, namely:

Type 1 – Leather industrial glove for welders

Type 2 – Leather industrial glove for workers in iron and steel industry

4.2. Size of Leather Industrial glove for welders – the following three sizes of leather industrial glove for welders are recommended on the basis of the total length, L (Fig. 1):

Size	length (L, mm)
Small	300±5
Medium	350±5
Large	400±5

5. Requirements

5.1. The two types shall be made to the shape and design as shown in fig. 1 & 2

5.1.1. the various dimensions of the industrial glove shall be as given in the respective figures with a tolerance of -2mm to +4mm on all the dimensions prescribed.

5.2. Materials – the three types shall be manufactured with the materials as specified in 4.2.1 to 4.2.3.

5.2.1. Leather – chrome tanned/chrome retanned full grain leather or flesh splits manufactured from cow hides conforming to the following requirements shall be used:

a) the leather and flesh split shall have thickness of 1.0 to 1.5 mm;

b) it shall be soft, pliable and free from flaws and loose fibers;

c) it shall be treated so as not to obscure defects and shall not be stained with compounds of iron;

d) in case of grain leather, it shall not crack on the grain side when bent grain outwards round a mandrel of 1.5mm dia. Through an angle of 180 degrees;

e) the leather shall not contain any chromate extractable by water or dilute acids;

f) the leather shall be treated for mildew resistance;

g) for the hand part and the inner face of the cuff, the leather and flesh split shall be of natural color. The outer face of the cuff and strengthening pieces may be printed and shall be of natural shade or dyed to any shade as agreed to between the buyer and the supplier;

h) the flesh side of leather shall be well buffed for types 2; and

i) the leather shall also comply with the requirements given in Table 1.

Table 1. Requirements for leather

S. No.	Characteristics	Requirement	Test Method
1.	Solvent extractable substances, percent by mass, max	5	ES ISO 4048
2.	Chromium content (as Cr_2O_3), percent by mass, min	2.5	ES ISO 5398-1
3.	pH of aqueous extract	Not below 3.5	ES ISO 4045
4.	Stitch tear strength of leather double hole, kg/cm, min	50	ES 1192
5.	Shrinkage temperature, ^{o}C, min	90	ES ISO 3380

5.2.2. Thread – cotton, polyamide-cotton core spun or any other suitable thread shall be used. For type 1 material, the thread used shall comply with the requirements given in col 3 of table 2. For type 2 materials, the thread shall comply with the requirements given in col 4 of Table 2.

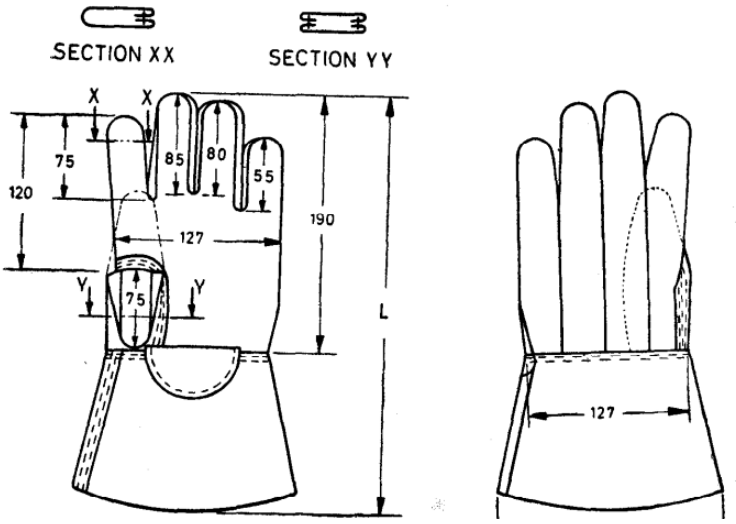
Table 2. Requirements for thread for use in leather industrial glove

S. No.	Characteristic	Requirement for thread for use in		Test method
		Type 1	Type 2	
1.	Length, m/kg, min	21 170	10 720	ES 3744
2.	Single thread breaking load, Newton's, min	10.8	21.1	ES 127

5.3. Manufacture

5.3.1. Type 1

5.3.1.1. The size of leather industrial glove for welders shall be as agreed to between the buyer and the supplier. The three sizes given in 3.2, however, have been recommended to cover varying length of cuff. The dimensions are shown in fig. 1 with tolerance as given in 5.1.1.



5.3.1.2. the hand part shall be cut from the piece of undyed leather and back portion including second, third and fourth fingers from different pieces of undyed leather.

5.3.1.3. the three different pieces of back portion shall be assembled and stitched together along the edges by a row of stitches. The back thus formed shall be secured with the

corresponding front pieces (palm side) of the fingers with a row of stitches. The thumb shall be made from two pieces of undyed leather and closed with the hand part by a seam. The seam of the thumb shall be reinforced by a strip of leather and secured by two rows of stitches.

5.3.1.4. the hand part shall be made with the flesh side up and the grain side to remain in contact with the hand.

5.3.1.5. the cuff portion shall be made from two pieces of leather, the inner portion being of leather, chrome tanned, natural color and the other portion made of chrome tanned leather, with grain side out.

5.3.1.6. two pieces of leather shall be seemed together by a single row of stitches on the finger side and two rows of stitches on the thumb side. The cuff part thus formed shall be secured with the hand part by two rows of stitches.

5.3.1.7. a dyed leather piece cut to the shape of a semi-circle shall be stitched on the inner part of the cuff along the joint of the hand and the cuff portions by a single row of stitches as shown in Fig. 1. The semi-circular piece of leather shall be not less than 75 mm in diameter.

5.3.1.8. the glove shall be machine stitched

5.3.1.9. the number of stitches for all the stitchings shall be 6 to8 stitches per 25mm.

5.3.1.10. all loose ends of stitching threads shall be securely fastened.

5.3.1.11. Workmanship and finish – In appearance, general workmanship and finish, and in all other respects not defined in this standard, the gloves shall conform to the approved sample.

5.3.2. Type 2

5.3.2.1. the dimensions of leather gloves for workers in iron and steel industry have been shown in fig. 2 with tolerances as given in 4.1.1. Other sizes of cuff length, if required, shall be subject to agreement between the purchaser and the supplier.

5.3.2.2. The inner face of the glove including the inner portion of index, second, third and fourth fingers shall be cut from on piece of leather. The thumb shall be cut from a separate piece of leather.

5.3.2.3. The leather components shall be assembled with the flesh side up, the grain side being inside.

5.3.2.4. The outer face of the glove including index second, third and fourth fingers shall be cut from one piece of canvas.

5.3.2.5. The thumb shall be made with the two cut sides placed together and stitched with one row of stitches. The thumb thus formed shall be attached to palm portion through the cut hole and secured by two rows of stitches as shown in fig 2.

All dimensions in millimetres.

FIG. 2 LEATHER GAUNTLETS FOR WORKERS IN IRON AND STEEL INDUSTRY

4.3.2.6 The joint at the palm and the thumb shall be reinforced with the same quality of leather as used for the inner face and stitched by two rows of stitches.

5.3.2.6. The back portion made of canvas shall be secured with the corresponding palm piece made of leather by two rows of stitches with the edges of both leather and canvas placed inside.

5.3.2.7. A leather strip, 20mm wide and of the same quality of leather used for the inner face of the glove, shall be used for reinforcing the face of canvas over the knuckles. The reinforcement piece shall be placed side up and secured by four rows of stitches.

5.3.2.8. The cuff portion shall be made from one piece of canvas, the side edges being stitched together by double row of stitches with the ends placed inside. The cuff thus formed shall be secured to the hand part by two rows of stitches with the edges of the

materials placed inside. The bottom edge of the cuff shall be hemmed (6mm) with the row edges properly turned in.

Table 3. Restricted Chemicals

Characteristics Requir ement		Test method
Chromium VI content	Below 3 mg/kg	ES ISO 17075
Formaldehyde content	Below 300mg/kg	ES ISO 17226
Pentachlorophenol (PCP)	Below 5 ppm	ES ISO 17070
Azo dyes	Below 30 ppm of any of the amines	ES ISO 17234 part 1&2
Lead (Pb)	Below 0.8mg/kg	ES ISO 17072

6. Marking and packing

6.1. Marking – the glove shall be legibly stamped on the inside of the cuff with the manufacturer's name or recognized trade – mark, if any, and the year of supply.

6.2. Packing – the glove shall be supplied in pairs suitably packed as agreed to between the purchaser and the supplier.

7. Sampling

For deciding the conformity of the lot to the requirements of the specification, glove shall be inspected for each lot separately. The number of pairs selected for this purpose and in case of dispute shall be as given in Table 4.

Table 4. Scale of sampling and permissible number of defectives

Number of glove pairs in the lot	Number of pairs to be selected	Permissible number of defective pairs
Up to 15	7	0
16 to 40	10	1
41 to 110	15	1
111 to 300	25	2
301 to 500	35	3

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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).

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