
**Leather Products - Sewing machines
general 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).

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Leather Products - Sewing machines general requirements

1. Scope

This Ethiopian standard covers general requirements for straight lock-stitch sewing machines head, suitable for driving with any mode of driving (such as hand attachment/foot arrangement/electrical motor); driving attachment – base/table/stand (one of the three) as integral parts of sewing machine.

2. Normative References

The Ethiopian standards given provisions which through reference in this text constitute provision of this standard. At the time of publication the editions indicated were valid. All standards are subjected to revision and parties to agreement based on this standard are encouraged to investigate the possibility of applying the most recent edition of the standards given .

ES ISO 5725, Accuracy (trueness and precision) of measurement methods and results — Part 4: basic methods for the determination of the trueness of a standard measurement method

ES ISO 10821, Industrial sewing machines — safety requirements for sewing machines, units and systems

ES 1345, Specification for tongued and grooved softwood flooring

ES 3734, white board

ES 1289, Specification for protected-type non-reversible plugs, socket-outlets cable couplers and appliance-couplers with earthing contacts for single phase AC circuits up to 250 volts

3. Driving arrangements

3.1. Hand operated machine

A hand operated machine shall be driven by a hand operated driving machine to allow it for placing of cover over the base. The handle shall be so geared that one revolution will drive the fly towards wheel at least three times. Hand operated machine shall also be suitable for foot/electric drive.

3.2. Foot operated machine

Foot operated machines shall be driven by a round leather belt from a hand wheel actuated by a foot treadle through a Pitman rod. The Pitman rod shall have a ball and a socket joint at the treadle end and a ball bearing at the crank end. Hand wheel and crank shall be mounted by trunnion bearing. A device shall be furnished to permit throwing the belt either off or on the hand when as desired. A safety dress guard shall be furnished.

3.3. Motor driven sewing machines

3.3.1. Electrical Equipment

The electric motor driven machine shall be supplied with starting switch and speed controller. Inter connecting wiring between speed controller and motor shall be of a flexible three cored PVC or equivalent wire to permit adjustment of the driving motor/speed controller. The electrical equipment shall conform to the safety requirements according to ES ISO 10821. Electric sewing light fixture shall be an optional feature.

3.3.1.1. The electric motor shall be of not less than 0.04kW. The selected rating of the motor shall be such as to ensure that it is not exceeded under full load operating condition. The motor shall generally comply with requirements of ES 1289. It shall be suitable for operating on a 220/240 volts, single phase 50/60 hertz ac supply or at 220/240 volts dc supply. The starting characteristics of the motor shall suit the driven machines.

3.3.1.2. Speed controller

Motor driven machines shall have a foot operated speed controller capable of starting, stopping and varying the speed smoothly.

3.3.1.3. Pulley and belt

The motor shall be fitted with a pulley of size appropriate for driving the sewing machine satisfactory at the required speed. A suitable endless driving belt made of suitable composite synthetic rubber with fabric reinforcement shall be used.

4. Sewing mechanism

4.1. Design

Machines shall be of single needle design, equipped with a sewing mechanism for producing two thread lock-stitch. A minimum clearance of 5mm shall be provided between the presser foot in its up position and the needle plate.

4.2. Reverse Stitch Mechanism

Sewing machines shall be provided with a suitable mechanism to reverse the feeding action of the feed dog for back tack stitching. The feeding direction shall be controlled by the stitch regulator and shall be capable of being changed while the machine is in operation.

4.2.1. Stitch regulator

The stitch regulator shall be conveniently located in the machine. It shall be capable of adjusting and locking the number of the stitch over a range of 8 to 20 stitches over 25 mm. there shall be an indication for the increase/decrease of the length of stitch.

4.3. Thread Tension

A thread arrangement shall be provided in each machine for both upper and lower threads and it shall be adjustable to the amount of tension required to achieve satisfactory stitches. Each machine shall be equipped with an automatic thread tension release, effective when the pressure foot is raised to the maximum height.

4.4. Timing

The timing of the needle in relation to the movement of the shuttle and clearance between the side of the needle (nearer to the shuttle) and the shuttle point should be such as to ensure that stitches are not skipped.

4.5. Fly Wheel

Each machine shall be fitted with a fly wheel designed in such a manner that the wheel can be disengaged from the sewing machine when required.

4.6. Bobbin Winder

Wind the bobbin which shall be actuated without separate power but by friction contact with the fly wheel, or driving belt of machine. The bobbin winder shall have suitable tension arrangement for controlling the thread to wind it evenly and with proper tension on the bobbin which shall be automatically released when the bobbin is filled to nearly 80% of its capacity.

4.7. Thread Spool Pin

Thread spoon pin should be provided for each machine to hold spools/tubes of thread on arm and bed plate.

5. Other components

The other sewing machine component shall be conforming to existing Ethiopian standards on sewing machine components.

6. Lubrication

Provision shall be made for ready and proper application of lubricate to all bearing and frictional surfaces on machine. Lubricating orifices may be identified by using the word 'OIL'. Hand attachment gears that are generally required to be lubricated shall be suitably covered to exclude dust and dirt. An orifice for lubricating oil shall be provided on the cover.

7. Table/Base/Stand

7.1. Table/Base/Stand shall be integral part of sewing machine and shall be supplied in wood or other suitable materials.

7.2. Wooden Table or Base

Wooden table and base shall confirm to ES 1345

7.3. Table or Base (Other Materials)

If mutually agreed between purchaser and supplier base or table for sewing machine may be supplied in other materials like plastics and other similar materials.

7.4. Stand

Stand for the sewing machine shall conform to ES 3734

8. Workmanship and finish

8.1. Sewing machines and its accessories shall be of rigid construction, neat in appearance and ready for use. They shall be free from objectionable vibrations and shall be quiet in operation.

8.2. Surface coated with paint and varnish shall be hard and smooth, free from irregularities, flaws, cracks, dust specks and other defects. Appearance of the painted surface shall be graceful, good in color and lustrous. The paint shall be unaffected by lubricating oils and not liable to soften at temperature up to 80oC. The transfer work shall be clear, neat and perfectly adhered to the paint coated surface and shall have a protective coat of clear stoving varnish.

8.3. Plating

Nickel and chromium plated parts shall satisfy the following conditions:

- a) Color and luster shall be good;
- b) Surface shall be smooth and free from plating defects, such as blisters, pits, clouds, patches cracks and stains;

- c) Coating shall not peel off easily.
- d) Thickness of nickel plus chromium coating of needle plate, slide plate, stop motion screw and fly wheel shall be conforming to service conditions number 1 .
- e) The bearing surface of needle bar and presser bar shall be hard chrome plated to a minimum depth of 0.004 m or case hardened. If the hardness for case hardened needle bar and presser bar is between 450-500HV, then the bushes of suitable material are provided in sewing machine are or normalized presser bar and needle bar shall be used.

9. Sampling

Unless otherwise agreed to between the supplier and the purchaser, the sampling plan as given below shall be followed.

In case the sewing machine is assembled from the components manufactured to the requirements of various Ethiopian standards and an adequate proof through the record of tests is submitted to the buyer, the single sample plan with inspection level II and percentage as given in table 1 & 2 .

10. Test

10.1. Accuracy requirements

Sewing machines shall conform to accuracy requirement as prescribed in ES ISO 5725

10.2. Sewing requirements

Sewing machine shall conform to sewing requirements prescribed in ES ISO 10821 and table below.

Table 1. Durability Requirements

S. No.	Item	Measuring condition	Measuring Direction	Indicator position	Maximum change in assembly clearance mm
1.	Needle bar	Needle bar at lower most position	a. In the direction of motion b) At right angle to the direction of motion	Needle bar Top Near the bottom of the needle bar	0'04 0'04
2.	Thread take up lever	Thread take up lever at top and intermediate position	a. In the direction of motion b. At the right angle to the direction of motion	Around thread hole	0'2 0'2
3.	Shuttle	a. Tip of pin at top-most/bottom – most position of needle bar b. Difference between two indicator readings when needle bar is at its highest and lowest position	Along the axis of pin -do-	Tip of shuttle pin	0'02
4.	Arm shaft	At different fly wheel position (turn fly wheel by hand) axial push/pull to be given	Axial direction	The face of the rim of flywheel	0'03
5.	Feed section	At its highest position above needle plate	In the direction of motion	Front edge of the feed dog	0'15

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- ❖ Develop Ethiopian standards and establish a system that enable to check whether goods and services are in compliance with the required standards,
- ❖ Facilitate 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.

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