

भारतीय मानक
Indian Standard

IS 15449 (Part 1) : 2024

**घरेलू प्रयोजनों के लिए जिग-जैग सिलाई
मशीन/हैड**

भाग 1 सामान्य अपेक्षाएँ

(पहला पुनरीक्षण)

**Household Zig-Zag Sewing
Machine/Head**

Part 1 General Requirements

(First Revision)

ICS 61.080

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FOREWORD

This Indian Standard (Part 1) (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Sewing Machines⁰ Sectional Committee had been approved by the Mechanical Engineering Division Council.

This standard was first published in 2004. This standard is being revised to keep pace with the latest technological developments and international practices. This revision has been brought out to bring the Indian Standard in the latest format incorporate the latest version of the referred standard. Bureau of Indian Standard certification marking clause has been modified to align with the revised *Bureau of Indian Standards Act, 2016*. The following major modifications have been incorporated in this revision of the standard:

- a) Title has been changed;
- b) Scope has been amended to include electronically controlled zig-zag operation;
- c) Stitch length range has been updated in [3.2.1](#);
- d) Stop motion mechanism has been updated in [3.5](#);
- e) Bobbin winder has been updated in [3.6](#);
- f) Stitch width selector has been updated in [3.8](#);
- g) Sewing mechanism of needle position selector has been updated in [3.9](#);
- h) Requirement for lubrication has been updated in [5](#);
- j) Raw materials for construction of sewing machine has been updated in [6.1](#);
- k) Painting and powder coating has been updated in [6.2](#);
- m) Plating requirement has been updated in [6.4](#);
- n) Clause [7.1.1](#) has been deleted;
- p) Safety requirements has been added in [8.4](#);
- q) Plug and socket requirements has been added in [8.5](#);
- r) Power cord requirements has been added in [8.6](#);
- s) Accessories in service box has been updated in [9](#); and
- t) Marking clause has been updated in [10.1](#) and [10.2](#).

This standard has been formulated to facilitate standardization and with a view to establish quality and general requirements of household zig-zag sewing machine/head, which includes machines with mechanical/electronically operated zig-zag operations.

The standard on household zig-zag sewing machine, which includes machines with mechanical/electronically operated zig-zag operations, is being brought in four parts, the other parts in the series are:

- Part 2 Accuracy requirements
- Part 3 Sewing requirements
- Part 4 Durability requirements

This standard covers all types of zig-zag sewing machine/head, excluding embroidery sewing machines.

The composition of the Committee responsible for the formulation of this standard is given in [Annex B](#).

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 2022 'Rules for rounding off numerical values (*second revision*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

*Indian Standard***HOUSEHOLD ZIG-ZAG SEWING MACHINE/HEAD****PART 1 GENERAL REQUIREMENTS***(First Revision)***1 SCOPE**

This standard (Part 1) covers the general requirements for household zig-zag sewing machine/head which includes mechanical or electronically controlled zig-zag operations.

NOTE — This standard covers all types of zig-zag sewing machine/head, excluding embroidery sewing machines.

2 REFERENCES

The standards listed in [Annex A](#) contain provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of these standards.

3 SEWING MECHANISM**3.1 Design**

Sewing machine/head shall be of single or twin or both needle design, equipped with a sewing mechanism for producing two thread lock stitch.

3.2 Reverse Stitch Mechanism

Sewing machine/head shall be provided with a suitable mechanism to reverse the feeding action of the feed dog for back-tack stitching. Reverse stitching mechanism shall be capable of changing the feed direction while the machine is in operation.

3.2.1 Stitch Length Regulator/Controller

The stitch length regulator/controller shall be conveniently located in the machine. It shall be capable of adjusting and locking the stitch length range of at least 0 mm to 4 mm (minimum 6 numbers of stitches per 25 mm length). There shall be an indication for the increase/decrease of the length of stitch on the regulator/controller.

3.3 Thread Tension and Releasing

A thread tension 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 for the upper thread, effective when the pressure foot is raised to the maximum height. The upper thread tension assembly shall be capable of guiding two threads for twin needle sewing operation.

3.4 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 shall be such as to ensure that stitches are not skipped.

3.5 Stop Motion Mechanism

There shall be a suitable arrangement for disengaging the sewing operation during the bobbin winding operation.

3.6 Bobbin Winder

A device shall be provided to wind the bobbin, which can be actuated with or without separate power.

The bobbin winder shall have a suitable tension arrangement for controlling the thread to wind it evenly and with proper tension on the bobbin which shall be automatically released or stopped when bobbin is filled to nearly 80 percent of its capacity.

3.7 Spool Pin

Threaded/taper or collapsible type pins shall be provided with each machine to hold spools/tubes of thread.

3.8 Stitch Width Selector

The sewing machine/head shall be provided with a suitable mechanism or control to adjust the zig-zag width from 0.00 mm (straight stitch) to at least up to 5.0 mm (stitch width may be more than 5.0 mm depending upon the design of sewing machine/head). Stitch width shall be capable of being changed while the machine is in operation.

3.9 Needle Position Selector

The sewing machine/head may be (optional) provided with a suitable mechanism or control for changing the needle positions at two or three different locations (left,

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center, and right or a combination thereof) while the machine is in operation.

4 OTHER COMPONENTS

The other components of the zig-zag sewing machine/head may contain parts conforming to existing Indian Standards on sewing machine components.

5 LUBRICATION

Lubrication may not be required in zig-zag machine/head, unless mentioned by the manufacturer in the instruction manual. If required, provision shall be made for ready and proper application of lubricant to the locations as mentioned in the instruction manual to be supplied along with the sewing machine/head.

6 CONSTRUCTION, WORKMANSHIP AND FINISH

6.1 The raw materials used for various parts shall be decided by the manufacturer considering its availability, suitability for the purpose of part and durability. The sewing machine/head with mechanically controlled zig-zag operations shall have main frame/body made of metal/metal alloy. However, the sewing machines/heads with electronically controlled zig-zag operations may be exempted from metal frame. Adequate plastic cladding needs to be used to cover the metal frames wherever required based on the machine design. The material of sewing machine/head and its accessories shall be neat in appearance, rigid and ready for use. They shall be free from objectionable vibrations, burrs and sharp edges.

6.2 Painting and Powder Coating

Parts painted or powder coated shall conform to IS 13607.

6.3 Silk screening/pad printing/stickering wherever applied on the sewing machine/head, shall be examined for the following:

- a) Correctness and uniformity;
- b) Alignment and straightness;
- c) Voids or gaps;
- d) Noticeable touch up;
- e) Shade of color; and
- f) Scratches, misprinting or other damage.

6.4 Plating

Nickel and chromium plated parts shall conform to IS 1068 and parts with zinc electroplating shall conform to IS 1573.

6.5 All exposed parts shall have smooth and clean appearance.

6.6 All exposed parts, including visible under bed parts shall be free from any signs of rust.

6.7 Plastic Parts

Plastic parts shall be examined for the following:

- a) Smoothness of finish, including sink marks;
- b) Uniformity of colour and shade; and
- c) Blemishes, stains, flow marks and scratches.

6.8 All the parts shall be properly aligned and positioned as per the product design.

6.9 Screws visible to the customer shall be checked for burrs, tool marks or other unsightly damage.

7 SAMPLING

Unless otherwise agreed to between the supplier and the purchaser, the sampling plan as given in IS 2500 (Part 1) shall be followed.

8 TESTS

8.1 Accuracy Requirements

Zig-zag sewing machine/head shall conform to accuracy requirements prescribed in IS 15449 (Part 2).

8.2 Sewing Requirements

Zig-zag sewing machine/head shall conform to sewing requirements prescribed in IS 15449 (Part 3).

8.3 Durability Requirements

Zig-zag sewing machine/head shall conform to durability requirements prescribed in IS 15449 (Part 4).

8.4 Safety Requirements

If the sewing machine contains electrical components, it shall meet the safety requirements given in the following of IEC 60335 (Part 2/Sec 28):

- a) Clause **7** marking;
- b) Clause **8** protection against access to live parts;
- c) Clause **10** power input and current;
- d) Clause **11** heating;
- e) Clause **13** leakage current and electric strength at operating temperature;
- f) Clause **15** moisture resistance;

- g) Clause **16** leakage current and electric strength;
- h) Clause **20** stability and mechanical hazards;
- j) Clause **21** mechanical strength;
- k) Clause **22** construction; and
- m) Clause **27** provision for earthing.

8.5 Plug and Socket Requirements

If applicable, the plugs and sockets used in the sewing machines shall conform to IS 1293.

8.6 Power Cord Requirements

If applicable, the power cord used in the sewing machines shall conform to IS 694 or IS 9968 (Part 1) or (Part 2), as applicable.

9 ACCESSORIES IN SERVICE BOX

The following items shall be supplied with each machine:

- a) Two screw drivers (engineering), one large (machine) and one small (tension) or any other tools to tighten or loosen the screws may be provided;
- b) Three bobbins made of plastic or metallic;
- c) Minimum one needle, twin needles and embroidery needle may be included as optional;

- d) Instruction manual; and
- e) Lubricating oil to be provided wherever it is recommended in the instruction manual, (depending on the model) else it may be optional.

10 MARKING

10.1 In addition to marking requirements specified in **7** of IEC 60335-2-28 (if applicable), each sewing machine/head shall be identified by a name plate or a screen print or sticker giving the name of model, manufacturer's name or trademark. The serial number of the sewing machine/head shall either be engraved/punched/printed or a suitable sticker may be pasted on the machine.

10.2 BIS Certification Marking

The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act, 2016* and the Rules and Regulations framed thereunder, and the product may be marked with the Standard Mark.

11 PACKING

Packing of zig-zag machine/head shall be such that the surface finishes of machine and components are not affected by mishandling, moisture and environment, etc.

ANNEX A

(Clause 2)

LIST OF REFERRED STANDARDS

<i>IS No./Other Standards</i>	<i>Title</i>	<i>IS No./Other Standards</i>	<i>Title</i>
IS 694 : 2010	Polyvinyl chloride insulated unsheathed and sheathed cables/cords with rigid and flexible conductor for rated voltages up to and including 450/750 V (<i>fourth revision</i>)	IS 9968 (Part 1) : 1988	Specification for elastomer insulated cables: Part 1 For working voltages up to and including 1 100 volts (<i>first revision</i>)
IS 1068 : 1993	Electroplated coatings of nickel plus chromium and copper plus nickel plus chromium – Specification (<i>third revision</i>)	IS 9968 (Part 2) : 2002	Specification for elastomer — Insulated cables: Part 2 For working voltages from 3.3 kV up to and including 33 kV (<i>first revision</i>)
IS 1293 : 2019	Plugs and socket-outlets for household and similar purposes of rated voltage up to and including 250 V and rated current up to and including 16 A — Specification (<i>fourth revision</i>)	IS 13607: 1992	Ready mixed paint, finishing, general purposes, synthetic — Specification
IS 1573 : 1986	Specification for electroplated coatings of zinc on iron and steel (<i>second revision</i>)	IS 15449 (Part 2) : 2004 (Part 3) : 2004 (Part 4) : 2004	Household zig-zag sewing machine head Accuracy requirements Sewing requirements Durability requirements
IS 2500 (Part 1) : 2000/ISO 2859-1 : 1999	Sampling procedures for inspection by attributes: Part 1 Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection (<i>third revision</i>)	IEC 60335 (Part 2/Sec 28) : 2021	Household and similar electrical appliances — Safety — Part 2-28: Particular requirements for sewing machines

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ANNEX B

(Foreword)

COMMITTEE COMPOSITION

Sewing Machines Sectional Committee, MED 29

<i>Organization</i>	<i>Representative(s)</i>
Research & Development Centre for Bicycle and Sewing Machines, Ludhiana	SHRI SANJEEV KATOCH (Chairperson) SHRI PAPINDER SINGH (<i>Alternate I</i>) SHRI VISHWAS MEHTA (<i>Alternate II</i>) SHRI MANPREET SINGH (<i>Alternate III</i>)
Brother International (India) Private Limited, Mumbai	SHRI MATHEW YOHANNAN
C. R. Auluck & Sons Private Limited, Ludhiana	SHRI SUNIL AULUCK SHRI KULJEET SINGH (<i>Alternate</i>)
Directorate General of Quality Assurance, New Delhi	SHRI R.V. JAIN
G. D. Rupal Industries, Ludhiana	SHRI GURMUKH SINGH
Gee Tech Hooks, Ludhiana	SHRI MANJEET SINGH
Geminy Industrial Enterprises Private Limited, Ludhiana	SHRI VINAY DUA SHRI B.C. PANDEY (<i>Alternate</i>)
Ludhiana Sewing Machine Association, Ludhiana	SHRI HARDEEP SINGH SHRI RAJVINDER (<i>Alternate</i>)
Makhan Sewing Machines, Ludhiana	SHRI DALBIR SINGH DHIMAN
Mechanical Engineering Research and Development Organization (MERADO), Ludhiana	SHRI SYED SALMAN MOJIZ SHRI BHAGWANT SINGH LAL (<i>Alternate</i>)
Narindera and Company, Ludhiana	SHRI S. BALDEV SINGH SHRI HARINDER JIT SINGH (<i>Alternate</i>)
Navrang Manufacturing Corporation, Ludhiana	SHRI DINESH KAPILA SHRI SUDESH KAPILA (<i>Alternate</i>)
Northern India Textile Research Association, Ghaziabad	SHRI VIKAS SHARMA SHRI VIVEK AGARWAL (<i>Alternate</i>)
Novel Sewing Machine Technologies, Pune	SHRI BHARAT NARAYENDAS PARMAR SHRI ARJUN BHARAT PARMAR (<i>Alternate</i>)
ORAA International, Ludhiana	SHRI ASHISH GUPTA
Office of Development Commissioner (MSME), New Delhi	SHRI SUVANKAR SANTRA MS MAITREYEE TALAPATRA (<i>Alternate</i>)
Ranew Engineering (India) Private Limited, Ludhiana	SHRI SANJEEV KUMAR JAIN SHRI ABHILASH JAIN (<i>Alternate</i>)
Rita Machines India Private Limited, Ludhiana	SHRI SUNIL KUMAR JAIN SHRI JAGDISH CHANDRA AULUCK (<i>Alternate</i>)
Singer India Limited, New Delhi	SHRI PRASHANT AGGARWAL SHRI ATUL KUMAR SETH (<i>Alternate</i>)
Swan Mechanical Works, Ludhiana	SHRI AMARJEET SINGH

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<i>Organization</i>	<i>Representative(s)</i>
United Sewing Machines and Parts Manufacturing Association, Ludhiana	SHRI DALBIR SINGH DHIMAN
Usha International Limited, New Delhi	SHRI RUP LAL KANGLA SHRI PRANAY SRIWASTAV (<i>Alternate</i>)
Uttam Sewing Machine Company (Private) Limited, Jalandhar	SHRI JAGDEEP RAI SHRI MANOHAR LAL (<i>Alternate</i>)
Virindra Engineering Works, Ludhiana	SHRI AMARPREET SINGH PANESAR SHRI SWARN SINGH (<i>Alternate</i>)
Voluntary Organisation in Interest of Consumer Education (VOICE), New Delhi	SHRI M. A. U. KHAN
BIS Directorate General	SHRI K. VENKATESWARA RAO, SCIENTIST 'F'/SENIOR DIRECTOR AND HEAD (MECHANICAL) [REPRESENTING DIRECTOR GENERAL (<i>Ex-officio</i>)]

Member Secretary
SHRI SHUBHAM TIWARI
SCIENTIST 'D'/DEPUTY DIRECTOR
(MECHANICAL), BIS

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