मानकः पथप्रदर्शकः

# COMPENDIUM OF INDIAN STANDARDS ON SEWING MACHINES

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# Introduction

Sewing machines are mechanical or electromechanical devices used to stitch fabric and other materials using thread. Their invention revolutionized the garment and textile industries by automating the manual process of stitching, thereby increasing efficiency, consistency, and production capacity.

Sewing machines are manufactured using cast iron or aluminum housings with internal precision-machined components made of steel or hardened alloys. Key manufacturing steps include casting, machining, heat treatment, assembly of subsystems (needle drive, shuttle hook, feed system), calibration, and quality testing. The standards published by BIS ensure consistency, safety, and performance of both complete machines and their individual components.

**Types of Sewing Machines**

There are three main types of sewing machines used for domestic and light industrial purposes, each with its own distinct mechanism:

1. Straight Stitch (Lockstitch) Sewing Machine (House-hold)
2. Zig-Zag Sewing Machine (House-hold)
3. Industrial Sewing Machine

This compendium aims at providing an overview of Indian Standards on Sewing Machine, offering insights into their varieties.
By compiling relevant standards on Sewing Machine in a single document, this compendium serves as a ready reference for professionals involved in manufacture of sewing machines which are efficient, reliable and safe.

# SECTION A -(Sewing Machines)

## 1. IS 1610:2018 – Household Sewing Machines – General Requirements

**Scope:**

This standard covers the general requirements for straight lock-stitch sewing machine head with central bobbin, oscillating shuttle and sewing mechanism designed for operation with any mode of driving arrangement (such as hand attachment/foot arrangement/electrical motor). The hand attachment with base and/or cover/ foot arrangement with stand and table/electrical motor with base (any one of the three combinations) may be supplied as optional parts of sewing machine head.

**Key Provisions:**

- Defines structural and mechanical criteria for components such as the feed mechanism, needle system, and bobbin case, ensuring reliable stitch formation and user safety.
- Includes testing parameters for stitch length uniformity, operational smoothness, and endurance, to verify durability and performance under typical household conditions.
- Emphasizes essential safety features like enclosed moving parts, low-voltage operation (for electric models), and stable machine base construction to prevent tipping or injury.

**Applications:**

- Design reference for manufacturers
- Conformity assessment by certification bodies
- Procurement by government and institutions

## 2. IS 15449-1:2024 – Zig-Zag Sewing Machine Head – Part 1: General Requirements

**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.

**Key Provisions:**

- Establishes specifications for oscillatory needle motion and swing amplitude to produce a range of decorative and functional stitches while maintaining stitch accuracy.
- Requires robustness of the cam and feed systems under varying stitch settings to avoid distortion or failure during prolonged use.
- Sets performance benchmarks including stitch consistency across speed variations, operational noise limits, and alignment precision during complex stitching motions.

**Applications:**

- Uniform terminology and definitions
- Standard basis for technical documentation and procurement

### 3. IS 12109:1987 – Light Duty Sewing Machine Heads for Industrial Use

**Scope:**

Covers the general requirements of light duty industrial sewing machine heads with maximum speed of 1 800 stitches per minute and mainly used for light fabric stitching. The main feature being rotary hook for lower thread which operates in a full rotary motion in a vertical plane on a horizontal axis, link-type, thread take-up and positive transmission from arm shaft to rotary hook shaft.

**Key Provisions:**

- Outlines material specifications and mechanical strength requirements suitable for sustained operation under light industrial workloads, including vibration resistance and wear tolerance.
- Covers essential functional tests such as stitch quality under continuous use, compatibility with industrial accessories, and dimensional interchangeability for machine upgrades.
- Stresses the importance of efficient heat dissipation and ergonomic design for operator comfort and long-term machine reliability.

**Applications:**

- Suitable for quality testing, certification, and R&D

# SECTION B

## (Indian Standards Related to Method of Test)

| Sl No | IS No. | IS Title |
|---|---|---|
| 1 | IS 15312 : 2003 | Method of test for seam puckering on materials sewn by industrial sewing machines |
| 2 | IS 15313 : 2003 | Method of test for vibration measurement for industrial sewing machines |
| 3 | IS 15314 : 2003 | Method of tests for tightness and balance of stitches on seam sewn by industrial sewing machines |
| 4 | IS 15449 (Part 2) : 2024 | Household Zig-Zag Sewing Machine/Head Part 2 Accuracy Requirements (First Revision) |
| 5 | IS 15449 (Part 3) : 2024 | Household Zig-Zag Sewing Machine/Head Part 3 Sewing Requirements (First Revision) |
| 6 | IS 15449 (Part 4) : 2024 | Household Zig-Zag Sewing Machine/Head Part 4 Durability Requirements (First Revision) |
| 7 | IS 7491 : 1989 | Sewing machines, household accuracy requirements (First Revision) |
| 8 | IS 7492 : 1989 | Sewing machines, household - Sewing requirements (First Revision) |
| 9 | IS 7493 : 1989 | Sewing machines, household - Durability requirements (First Revision) |

# SECTION C
## (Indian Standards Related to Components)

| Sl No | IS No. | IS Title |
|---|---|---|
| 1 | IS 10040 : 1981 | Specification for rotating hooks for sewing machines for industrial use |
| 2 | IS 10304 : 2024 | Feed Rock Shaft for Sewing Machines for Household Purposes - Specification ( First Revision ) |
| 3 | IS 10305 : 2025 | Sewing Machine for Household Purposes - Feed Rock Shaft Crank - Specification ( First Revision ) |
| 4 | IS 10306 : 2025 | Sewing Machine for Household Purposes - Feed Lifting Rock Shaft Crank - Specification (First Revision) |
| 5 | IS 9874 : 1981 | Specification for arm and bed assembly for sewing machines for household purposes |
| 6 | IS 11280 : 1996 | Household sewing machines - Feed bars - Specification (First Revision) |
| 7 | IS 11345 : 1985 | Specification for oscillating shaft crank for sewing machines for household purposes |
| 8 | IS 11347 : 1995 | Household sewing machtnes - Shuttle driver - Specification (First Revision) |
| 9 | IS 12058 : 2024 | Slide Plates for Sewing Machines for Household Purposes - Specification (First Revision) |

# SECTION C
## (Indian Standards Related to Components)

| Sl No | IS No. | IS Title |
|---|---|---|
| 9 | IS 12740 : 1989 | Household sewing machines - Stand - Specification |
| 10 | IS 12789 : 2024 | Household Sewing Machines - Tables and Base -Specification ( First Revision ) |
| 11 | IS 1294 : 1989 | Household sewing machines - Bobbins - Specification (Third Revision) |
| 12 | IS 1295 : 1990 | Household sewing machines - Needle bar - Specification (Second Revision) |
| 13 | IS 1296 : 2024 | Household sewing machine- presser foot-specification |
| 14 | IS 1297 : 2024 | Household sewing machine-presser bar -specification |
| 15 | IS 13120 : 1991 | Household sewing machines - Flywheel bush - Specification |
| 16 | IS 13192 : 2025 | Household Sewing Machines - Hand Attachment Assembly ( First Revision ) |
| 17 | IS 13806 : 2025 | Household sewing machine - closed type shuttle race assembly - specification (first revision) |
| 18 | IS 13825 : 2024 | Household Sewing Machines - Arm Shaft Front Bush - Specification (First Revision) |

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## (Indian Standards Related to Components of Sewing Machines)

| Sl No | IS No. | IS Title |
|---|---|---|
| 19 | IS 13872 : 1993 | Household sewing machine - Stitch regulators - Specification |
| 20 | IS 13972 : 2024 | Household Sewing Machines - Bobbin Winder Assembly - Specification ( First Revision ) |
| 21 | IS 14207 : 2025 | Household Sewing Machines - Open Type Shuttle Race Sub-Assembly - Specification ( First Revision ) |
| 22 | IS 14477 : 1997 | Industrial sewing machines (Light Duty) - Stand - Specification |
| 23 | IS 14761: 2000 | Link type thread take up lever sub assembly for industrial sewing machines - Specification |
| 24 | IS 15169 : 2002 | Needles for sewing machines for industrial purpose - Specification |
| 25 | IS 2181 : 2024 | Sewing Machine Needles for Household Purposes - Specification ( Second Revision ) |
| 26 | IS 3290 : 2025 | Household Sewing Machines - Thread Take-Up Lever Sub-Assembly for Cam-Type Machines - Specification ( Fourth Revision ) |
| 27 | IS 3291 : 2023 | Thread take up cams for sewing machines for household purposes Specification |

# SECTION C

## (Indian Standards Related to Components of Sewing Machines)

| Sl No | IS No. | IS Title |
|---|---|---|
| 28 | IS 3299 : 2025 | Oscillating Rock Shafts for Sewing Machines for Household Purposes - Specification ( Second Revision ) |
| 29 | IS 3375 : 1991 | Household sewing machines - Bobbin case - Specification (Second Revision) |
| 30 | IS 3816 : 2025 | Connecting Rods for Sewing Machines for Household Purposes - Specification ( First Revision ) |
| 31 | IS 3817 : 2024 | Household Sewing Machines- Arm Shaft -Specification (Second Revision) |
| 32 | IS 3868 : 2025 | Feed Lifting Rock Shaft for Sewing Machines for Household Purposes - Specification (First Revision) |
| 33 | IS 4181 : 1967 | Specification for feed fork for sewing machines for household purposes |
| 34 | IS 4188 : 1996 | Household sewing machines - Oscillating shaft - Specification (First Revision) |
| 35 | IS 4338 : 2025 | Household Sewing Machines Vertical Oscillating Shuttle - Specification Third Revision) |
| 36 | IS 4339 : 1997 | Household sewing machines - Needle bar link studs -Specification (First Revision) |

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## (Indian Standards Related to Components of Sewing Machines)

| Sl No | IS No. | IS Title |
|---|---|---|
| 37 | IS 4340 : 2025 | Needle Bar Links For Sewing Machines For Household Purposes - Specification (FIRST REVISION) |
| 38 | IS 4341 : 2024 | Household sewing machines - feed bar rollers and studs - specification ( second revision ) |
| 39 | IS 4342 : 1967 | Specification for square slider for oscillating rock shaft for sewing machines for household purposes |
| 40 | IS 4632 : 1968 | Specification for square sliders for stitch regulators for sewing machines for household purposes |
| 41 | IS 4735 : 1968 | Specification for arm shaft cams for sewing machines for household purposes |
| 42 | IS 5740 : 1996 | Household sewing machines - Memorandum on screw threads for sewing machine components (First Revision) |
| 43 | IS/ISO 8239 : 1987 | Sewing Machine Needles - Fitting Dimensions - Tolerances and Combinations |
| 44 | IS 8892 : 1978 | Specification for bobbins for sewing machines with rotating hooks for industrial use |
| 45 | IS 9697 : 1980 | Specification for bobbin cases for sewing machines with rotating hooks for industrial use |

# SECTION C
# (Indian Standards Related to Components)

## IS 2181:2024 – Sewing Machine Needles

**Scope:**

Specifies the dimensions, materials, and performance requirements for needles used in household sewing machines.

**Key Provisions:**

- Specifies material, dimensions, and performance criteria for sewing machine needles used in households to ensure durability and proper fit with domestic machines.
- Includes standard testing methods to verify the strength, functionality, and safety of the needles.
- Mandates proper labeling and packaging for easy identification and safe consumer use.

**Applications:**

- Specifies the geometry, length, point type, and shank diameter of needles to ensure compatibility with standard machines and fabric types.
- Requires corrosion-resistant materials and precise heat treatment to enhance longevity and reduce the risk of breakage or tip deformation.
- Incorporates tests for dimensional accuracy, tensile strength, and smooth surface finish to support consistent stitching and minimize thread or fabric damage.

## IS 3290:2025 – Thread Take-Up Lever

**Scope:**

Specifies requirements for thread take-up levers in cam-type household sewing machines.

**Key Provisions:**

- Defines the range of angular motion and structural strength needed to ensure synchronized thread pulling during each stitch cycle.
- Stipulates surface finish and material durability to reduce thread wear and friction, contributing to even tension and reduced stitch skipping.

**Applications:**

- Assists in maintaining thread tension accuracy
- Supports reliable stitch quality
- Used by designers, testers, and technicians

## IS 3816:1966 – Connecting Rods

**Scope:**

Covers material properties and dimensions for connecting rods in household sewing machines.

**Key Provisions:**

- Establishes performance standards for torque transmission between the crankshaft and needle mechanism, ensuring minimal mechanical losses and wear.
- Requires high fatigue strength and dimensional precision to maintain alignment and minimize vibrations during rapid stitching cycles.
- Evaluates balance and weight distribution to prevent uneven motion that could degrade stitch quality.

**Applications:**

- Used in quality inspections during manufacturing
- Enhances mechanical stability and machine life
- Guides maintenance and replacement procedures
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## IS 3868:2025 – Feed Lifting Rock Shaft

**Scope:**

Specifies design and material standards for feed lifting rock shafts in household sewing machines.

**Key Provisions:**

- Details movement precision and force distribution necessary for controlled fabric feeding across stitch lengths.
- Requires impact-resistant construction to endure sudden start-stop cycles without misalignment or wear.
- Prescribes material and hardness standards that support longevity and reduce component deformation under load.

**Applications:**

- Used in machine design and performance testing
- Ensures accurate stitch placement
- Reduces stitching errors and mechanical failure

## IS 4188:1996 – Oscillating Shaft

**Scope:**

Specifies standards for oscillating shafts in household sewing machines.

**Key Provisions:**

- Specifies geometry and mounting tolerance to maintain correct timing in rotary and oscillating motions critical for stitch formation.
- Mandates resistance to torsional stress and operational heat, ensuring stable and noise-free operation over extended use.
- Includes cyclic endurance testing to validate performance consistency and mechanical durability.

**Applications:**

- Crucial for smooth machine operations
- Used for standard testing and design validation
- Improves long-term machine performance