*भारतीय मानक*

**घरेलू सिलाई मशीन — खुला टाइप शटल रेस**

**उप-समुच्य — विशिष्टि**

( *पहला पुनरीक्षण* )

 *Indian Standard*

**Household Sewing Machines — Open
Type Shuttle Race Sub-Assembly — Specification**

( *First Revision* )

ICS 61.080

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भारतीय मानक ब्यूरो

**B U R E A U OF I N D I A N S T A N D A R D S**

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**FOREWORD**

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

This standard was first published in 1994. The present revision has been taken up with a view incorporating the modification found necessary as a result of experience gained in the use of this standard. Also, in this revision, the standard has been brought into latest style and format of Indian Standards, and references to Indian Standards, wherever applicable have been updated. BIS certification marking clause has been modified to align with the revised *Bureau of Indian Standard Act*, 2016.

Major change in this revision is as follows:

1. Dimensions for open type shuttle race sub-assembly have been modified.

The standard has been prepared to standardize the open type shuttle race to ensure correct fitting and functioning with other mating components of sewing machine.

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 SEWING MACHINES — OPEN TYPE SHUTTLE RACE SUB-ASSEMBLY — SPECIFICATION

( *First Revision* )

**1 SCOPE**

This standard covers the requirements of two types of open type shuttle race for sewing machines for household purposes.

**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 the standards listed in Annex A.

**3 NOMENCLATURE**

**3.1** The nomenclature for the open type shuttle race shall be as indicated in Fig. 1.

**4 TYPES**

The two types of open type shuttle race for sewing machines for household purposes based on dimension is as follows:

1. Type A; and
2. Type B.

NOTE**—** *See* Fig. 2 for the details of Type A and Type B open type shuttle race.

**5 MATERIAL**

**5.1** The material for the open type shuttle race is specified as follows.

**5.1.1** The shuttle race body shall be made from cast iron of suitable grade conforming to IS 210.

**5.1.2** The shuttle race ring shall be made from case hardening steel conforming to
IS 4432 so as to achieve a hardness of 450 HV in the finished state [*see* IS 1501 (Part 1)/ISO 6507-1].

**5.1.3** The shuttle race ring spring and top plate may be designed as per IS 10878 (Part 1) and shall conform to the requirements of IS 10878 (Part 2). The material used for spring shall conform to IS 2507. These shall be hardened and tempered.

**5.1.4** The pins and all screws to be used for open type shuttle race sub-assembly shall be made of carbon steel and shall be case hardened.

**6 DIMENSIONS AND TOLERANCES**

The fitting dimensions and tolerances of open type shuttle race shall be as given in Fig. 2.

**7 WORKMANSHIP AND FINISH**

**7.1** Surface on sliding part and thread passage shall be finely polished to avoid damage or breakage of thread when working with the shuttle.

**7.2** Surface of casting shall be treated by plating or other adequate surface treatment.

**7.3** Fitting parts such as springs, screws, knobs, and pins shall have nickel-plated/blackened surface finish conforming to at least service condition number 1 with designation Fe/Ni l0b Cr r of IS 1068.

**8 SAMPLING**

Unless otherwise agreed to between the purchaser and the supplier, the sampling plan as given in Annex B shall be followed. For further information reference may be made to IS 2500 (Part 1).

**9 MARKING**

**9.1** Each piece of the shuttle race shall be legibly and indelibly marked with the following:

1. Source of manufacture and trade-mark, if any; and
2. Type of shuttle race.

**9.2 BIS Certification Marking**

The product may also be marked with Standard Mark.

**9.2.1** 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(s) may be marked with the Standard Mark.

**10 PACKING**

Each shuttle race shall be given a suitable antirust coating and wrapped in polyethylene bags. The wrapped shuttle race shall be securely packed in accordance with best prevalent trade practices. Each package shall bear the manufacturer’s name or trade-mark, type and description of contents.



Fig. 1 Nomenclature For Open Type Shuttle Race Sub-Assembly



All dimensions in millimetres

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Sl No.** | **Dimensions** | ***C*** | ***D*** | ***E*** | ***F*** | ***G*** | ***H*** | ***J*** | ***K*** | ***L*** |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) |
|  | Type A | 62.35 | 31.363 | 4.582  | 69.5 | 64.584 | 42.672 | 4.013 | 0.038 | 4.331 |
|  | 62.45 | 31.337 | 4.600 | 69.4 | 64.554 | 42.647 | 3.988 | 0.013 | 4.305 |
|  | Type B | 63.550 | 31.775 | 4.600 | 69.830 | 64.720 | 42.722 | 4.064 | 2.311 | 2.311 |
|  | 63.450 | 31.725 | 4.580 | 69.792 | 64.570 | 42.672 | 4.014 | 2.261 | 2.261 |

Fig. 2 Dimensions For Open Type Shuttle Race Sub-Assembly

**ANNEX A**

( *Clause* 2)

**LIST OF REFERRED STANDARDS**

|  |  |
| --- | --- |
| *IS* / *ISO No.* | *Title* |
| IS 210 : 2009 | Grey iron castings ― Specification (*fifth revision*) |
| IS 1068 : 1993 | Electroplated coatings of nickel plus chromium and copper plus nickel plus chromium on iron and steel |
| IS 1366 : 2022/ISO 1207 : 2011 | Slotted cheese head screws — Product grade A (*fourth revision*) |
| IS 1501 (Part 1) : 2020/ ISO 6507-1:2018 | Metallic materials — Vickers hardness test Part 1 Test method ( *fifth revision* ) |
| 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 (*third revision*) |
| IS 2507 : 1975 | Cold rolled steel strips for springs (*first revision*) |
| IS 4432 : 1988 | Case hardening steels (*first revision*) |
| IS 4905 : 2015/ISO 24153 : 2009 | Random sampling and randomization procedures (*first revision*) |
| IS 10878 (Part 1) : 1984 | Flat form springs: Part 1 Design and calculation for springs made from rectangular cold-rolled strips |
| IS 10878 (Part 2) : 1984 | Flat form springs: Part 2 Specification for springs made from rectangular cold-rolled strips |

**ANNEX B**

(*Clause* 8)

**SCALE OF SAMPLING AND CRITERIA FOR CONFORMITY**

**B-1 SCALE OF SAMPLING**

**B-1.1** ln any consignment, all shuttle races of the same type and manufactured from the same material under essentially similar conditions of manufacture shall be grouped together to constitute a lot.

**B-1.2** For ascertaining the conformity of the lot to the requirements of the specification, tests shall be carried out for each lot separately. The number of shuttle races to be selected at random for this purpose shall be in accordance with co1umn (2) and (3) of Table 1.

**B-1.3** If the shuttle races are packed individual, in order to ensure the randomness of selection, IS 4905 shall be used.

**B-1.4** If the shuttle races are packed ii1 different cartons, a suitable number of cartons (not less
than 20 percent of the total in the lot subject to a minimum of 2) shall be chosen at random. From each of the cartons so chosen, an approximately equal number of shuttle races shall be picked up from its different parts so as to obtain the required number of shuttle races specified in co1umn (3) of Table 1.

**B-2 NUMBER OF TESTS AND CRITERIA FOR CONFORMITY**

 **A-2.1** The shuttle races selected according to **B-1.2** and **B-1.3** or **B-1.4** shall be examined for dimensions and tolerances (*see* **6**), and workmanship and finish (*see* **7**). If the number of shuttle races failing to meet one or more of the requirements mentioned above is less than or equal to the permissible number of defectives given in column (4) of Table 1, the lot shall be declared as conforming to the requirements of these characteristics.

**Table 1 Scale of Sampling and Permissible Number of Defectives**

(*Clauses* **B-1.2**, **B-1.4**, *and* **B-2.1**)

|  |  |  |
| --- | --- | --- |
| **Sl No.** | **No. of Shuttles Races in the Lot***N* | **For Dimensions, Tolerances and Workmanship and Finish** |
| Sample Size*n* | Permissible No. of Defectives1) |
| (1) | (2) | (3) | (4) |
|  | Up to 15 | 5 | 0 |
|  | 16 to 40 | 8 | 0 |
|  | 41 to 110 | 13 | 0 |
|  | 111 to 300 | 20 | 1 |
|  | 301 to 500 | 32 | 1 |
|  | 501 to 800 | 50 | 2 |
|  | 801 to 1 300 | 80 | 3 |
|  | 1 301 and above | 125 | 5 |

1) This ensures that lots containing one and a half percent or less defective will be accepted most of the time.

**ANNEX C**

(*Foreword*)

**COMMITTEE COMPOSITION**

Sewing Machines Sectional Committee, MED 29

|  |  |
| --- | --- |
| *Organization* | *Representative (s)* |
| Research & Development Centre For Bicycle and Sewing Machines, Ludhiana | Shri Sanjeev Katoch (***Chairperson***) Shri Papinder Singh (*Alternate* I) Shri Vishwas Mehta (*Alternate* II) Shri Manpreet Singh (*Alternate* III) |
| Brother International (India) Private Limited, Mumbai | Shri Mathew Yohannan |
| C.R. Auluck & Sons Private Limited, Ludhiana | Shri Sunil Auluck Shri Kuljeet Singh (*Alternate*) |
| Directorate General of Quality Assurance, New Delhi | Shri 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 (*Alternate*)  |
| Ludhiana Sewing Machine Association, Ludhiana | Shri Hardeep Singh Shri Rajvinder (*Alternate*) |
| Makhan Sewing Machines, Ludhiana | Shri Dalbir Singh Dhiman |
| Narindera and Company, Ludhiana | Shri S. Baldev Singh Shri Harinder Jit Singh (*Alternate*) |
| Navrang Manufacturing Corporation, Ludhiana | Shri Dinesh Kapila Shri Sudesh Kapila (*Alternate*) |
| Northern India Textile Research Association, Ghaziabad | Shri Vikas Sharma Shri Vivek Agarwal (*Alternate*) |
| Novel Sewing Machine Technologies | Shri Bharat Narayendas Parmar Shri Arjun Bharat Parmar (*Alternate*) |
| ORAA International, Ludhiana | Shri Ashish Gupta |
| Office of Development Commissioner(MSME), New Delhi | Shri Suvankar Santra Ms. Maitreyee Talapatra (*Alternate*) |
| Ranew Engineering (India) Private Limited, Ludhiana | Shri Sanjeev Kumar Jain Shri Abhilash Jain (*Alternate*) |
| Singer India Limited, New Delhi | Shri Prashant Aggarwal Shri Atul Kumar Seth (*Alternate*) |
| Swan Mechanical Works, Ludhiana | Shri Amarjeet Singh |
| United Sewing Machines and Parts Manufacturing Association, Ludhiana | Shri Dalbir Singh Dhiman |
| Usha International Limited, New Delhi | Shri Rup Lal Kangla  Shri Pranay Sriwastav (*Alternate*) |
| Uttam Sewing Machine Company (Private) Limited, Jalandhar | Shri Jagdeep Rai Shri Manohar Lal (*Alternate*) |
| Virindra Engineering Works, Ludhiana | Shri Amarpreet Singh Panesar Shri Swarn Singh (*Alternate*) |
| 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 Department)[Representing Director General (*Ex-officio*)] |

*Member Secretary*

Shri Shubham Tiwari

Scientist ‘D’/Joint Director

 (Mechanical Department), BIS