भारतीय मानक **IS 2181 : 2024**

Indian Standard

घरेलू प्रयोजनों की सिलाई मशीन सुईयाँ — विशिष्टि

(दूसरा पुनरीक्षण)

Sewing Machine Needles for Household Purposes — Specification

(Second Revision)

ICS 61.080

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November 2024 **Price Group 6**

Sewing Machines Sectional Committee, MED 29

FOREWORD

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

This standard was first published in 1962 and subsequently revised in 1973. This standard is being revised to keep pace with the latest technological developments and international practices. Also, in this revision, the standard has been brought into the latest style and format of Indian Standards, and references of Indian Standards, wherever applicable have been updated. BIS certification marking clause has been modified to align with the revised *Bureau of Indian Standards Act*, 2016. In this revision, all the amendments have been incorporated. Also, the dimensions for sewing machine needles have been modified.

Comparisons of designation in various systems for household sewing machines needles are given in Annex A.

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 SEWING MACHINE NEEDLES — SPECIFICATION

(Second Revision)

1 SCOPE

This standard covers the requirements of sewing machine needles for household purposes.

2 REFERENCES

The standards given below 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 edition of these standards:

IS No.	*Title*
IS 1101 : 1981	Specification for handloom cotton cellular shirting (*first revision*)
IS 1501 (Part 1) : 2020/ISO 6507-1 : 2018	Metallic materials — Vickers hardness test: Part 1 Test method (*fifth revision*)
IS 1586 (Part 1) : 2018/ISO 6508-1 : 2016	Metallic materials — Rockwell hardness test: Part 1 Test method (*fifth revision*)
IS 1720 : 1978	Specification for cotton sewing threads (*first revision*)

3 NOMENCLATURE

For the purpose of this standard, the nomenclature of the various parts of the needle shall be as given in Fig. 1.

4 MATERIAL

The needles shall be manufactured from high carbon needle wire recommended for the needle manufacture.

Typical compositions of two types of steel suitable for needle manufacture are given in Table 1.

5 HARDNESS

The hardness of the needle near the stem or centre of flat portion of shank shall be more than 615 HV, when tested as per IS 1501 (Part 1)/ISO 6507-1 or 56 HRC when tested as per IS 1586 (Part 1)/ISO 6508-1.

6 DIMENSIONS

6.1 The dimensions and tolerance for various sizes of needles covered under 2020 as defined in **8.2** shall be as given in Table 2.

6.2 The dimensions and tolerances covered under 2020N and 2045 as defined in **8.2** shall be as given in Table 3.

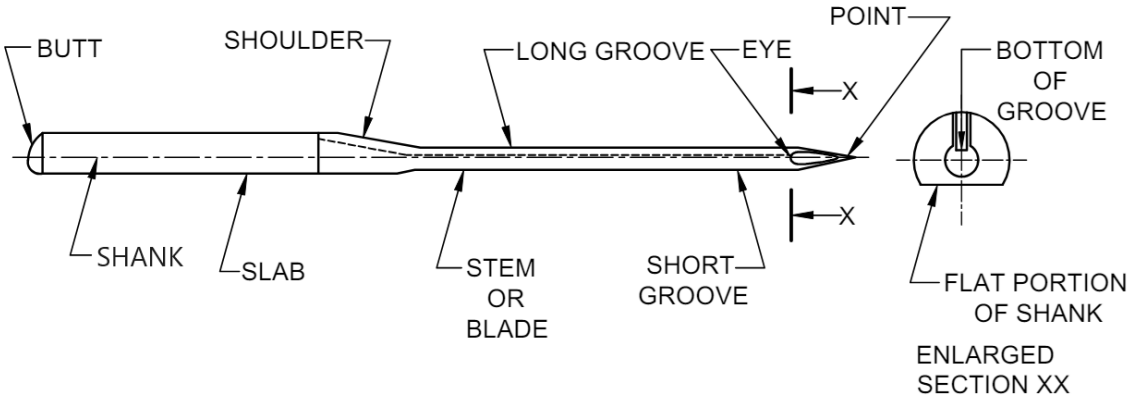


FIG. 1 NOMENCLATURE OF SEWING MACHINE NEEDL

Table 1 Typical Material Composition

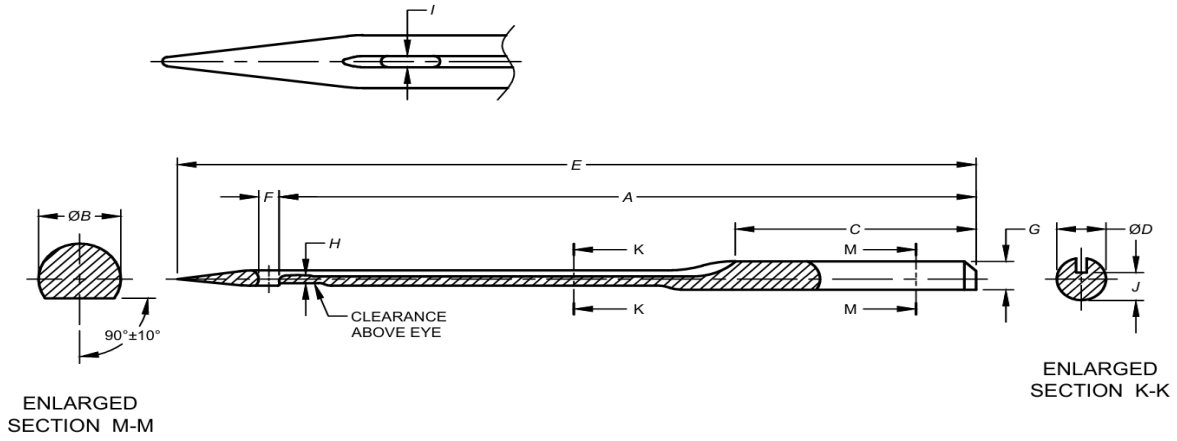
(*Clause* 4)

Sl No.	Constituent (Elements)	Percentage	
		Type 1	Type 2
(1)	(2)	(3)	(4)
i)	Carbon	0.95 to 1.04	0.75 to 0.85
ii)	Silicon	0.10 to 0.25	0.12 to 0.32
iii)	Manganese	0.25 to 0.60	0.30 to 0.60
iv)	Chromium	0.10 to 0.30	–
v)	Sulphur	0.05 *Max*	0.035 *Max*
vi)	Phosphorus	0.05 *Max*	–

Table 2 Dimensions for Sewing Machine Needles

(*Clauses* 6.1 *and* 11.1)

All dimensions in millimetres.

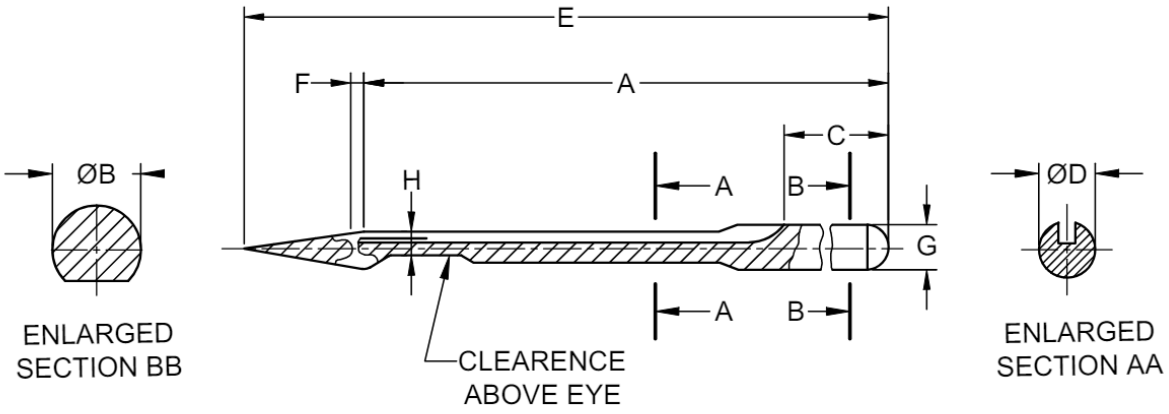


Sl No.	Parameters	Needle Size						Tolerance
		9	11	14	16	18	21	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
i)	A	33.8	33.8	33.8	33.8	33.8	33.8	± 0.2
ii)	B	2.02	2.02	2.02	2.02	2.02	2.02	± 0.03
iii)	C	11.7	11.7	11.7	11.7	11.7	11.7	–
iv)	D	0.67	0.77	0.92	1.02	1.12	1.3	± 0.02
v)	E	38.10	38.20	38.50	38.80	39.20	40.1	± 0.2
vi)	F	0.80	0.90	1.05	1.15	1.25	1.35	–
vii)	G	1.45	1.50	1.57	1.62	1.67	1.75	± 0.05
viii)	H	0.18	0.21	0.23	0.26	0.33	0.39	± 0.02
ix)	I	0.26	0.30	0.36	0.40	0.44	0.48	–
x)	J	0.32	0.37	0.50	0.56	0.62	0.67	–
xi)	Bend	0.08	0.20	0.30	0.35	0.28	0.38	–
xii)	Hardness (HV)	615	615	615	615	615	615	–

Table 3 Dimensions of Sewing Machine Needles

(*Clause* 6.2)

All dimensions in millimetres.



NOTE — Recess above the short groove is known as clearance above eye (CAE). Additional features in 2020N and 2045 needles as defined under **8.2**.

Sl No.	Dimensions	Needle Size					Tolerance
		9	11	14	16	18	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
i)	A	33.8	33.8	33.8	33.8	33.8	± 0.20
ii)	B	2.03	2.03	2.03	2.03	2.03	± 0.020
iii)	C	11.7	11.7	11.7	11.7	11.2	± 0.30
iv)	D	0.7	0.8	0.9	1.0	1.1	Up to including no. 14, ± 0.020 above no. 14, ± 0.03
v)	E	38 1	38.6	38.6	38.6	39 4	± 0.20
vi)	F	0.65	0.75	0.85	0.98	1.10	± 0.15
vii)	G	1.42	1.45	1.50	1.85	1.60	± 0.03
viii)	H	0 18	0.21	0.23	0.26	0.33	± 0.02

7 DESIGNATION

Needles shall be designated by the appropriate needle size and number as per this standard.
Example:

Needle 14, IS 2181.

8 WORKMANSHIP AND FINISH

8.1 General

The needles shall be nickel plated. The surface shall be free from perceptible defects such as sharp edges and burrs specially in the way of the eye.

8.2 Point

The point of the needle shall be symmetrical to the centre line of the needle and shall be sharp and well-rounded so that it punches the cloth smoothly without tearing.

The shape of the needles shall be as under:

a) For 2020 needles — It shall be sharp set point, designation as ‘SS’;

b) For 2020N needles — It shall be rounded sharp set point, designation as ‘RS’; and

c) For 2045 needles — It shall be light ball point, designation as 'LB'.

9 PERFORMANCE TESTS

9.1 Performance

A needle conforming to this standard when worked with a good quality sewing machine under the sewing conditions as indicated in Table 4 shall meet the following requirements:

a) There shall be no breakage of the thread;

b) There shall be no skipped stitches;

c) Needle shall not get bent; and

d) Needle shall not get blunt at the point.

NOTE — Table 4 shows the test conditions for one typical needle size, namely needle no. 14. For different size of needles, however, the size and kind of thread, the type of cloth and the number of layers shall be suitably selected.

9.2 Bend Test — A needle conforming to this standard shall withstand satisfactorily the test given in **9.2.1**.

Table 4 Sewing Conditions

(*Clause* 9.1)

Sl No.	Item	Stitching Parameters						
		Needle size	Kind of Thread	Cloth	Number of Layers	Stitch Length Approx mm	Sewing Speed (rev/mm)	Sewing Length Approx mm
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
i)	Common sewing test	14	Cotton sewing thread[1)] 15 tex × 3	Shirting[2)]	2 layers	1.5 3	300 600 1 000	500
ii)	Sewing test on steps	14	Cotton sewing thread[1)] 15 tex × 3	Shirting[2)]	From 4 to 12 layers and from 12 to 4 layers	1.5 3	300 600	250
iii)	Sewing test on thicker material	14	Cotton sewing thread[1)] 15 tex × 3	Shirting[2)]	6 layers	3	600	500

9.2.1 The needle shall be held on its shank in a suitable damp. A gradual load shall be applied at the eye of needle in a direction that the needle bends towards the flat portion of the shank. The application of the load shall be continued till the eye deflects by 4 mm from its original position (*see* Fig. 2). This position shall be maintained for three seconds after which the load shall be removed. The permanent set, measured at the eye shall not exceed the following limits:

Sl No.	*Needle Size*	*Permanent Set*, mm
(1)	(2)	(3)
i)	9	0.08
ii)	11	0.20
iii)	14	0.30
iv)	16	0.35
v)	18	0.38
vi)	19	0.40
vii)	21	0.40

10 PRESERVATION AND PACKING

Needles shall be packed either in oiled paper with a thin foil after being treated with suitable preventive or in vapour phase inhibitor paper (commonly known as VPI paper) or otherwise in accordance with the best prevalent trade practice to prevent exposure to air.

11 MARKING

11.1 Each needle shall be marked with the needle size (as given in Table 2) and the manufacturer's name or trade-mark. The packets shall also be marked similarly.

11.2 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.

12 SAMPLING

The sampling plan and criteria for conformity shall be as agreed to between the purchaser and the supplier.

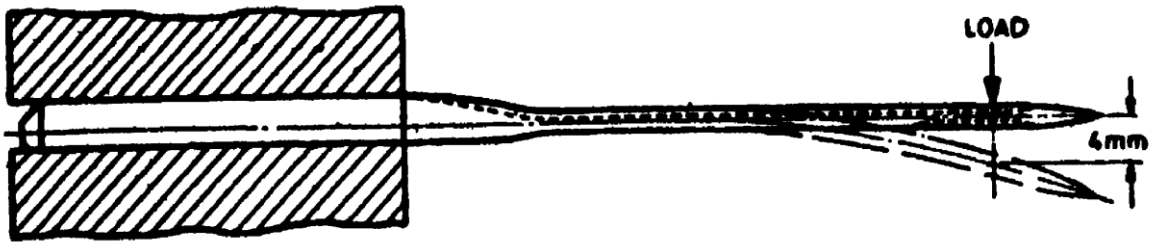


FIG. 2 BEND TEST

[1] IS 1720 Specification for cotton sewing threads.

[2] IS 1101 Specification for handloom cotton cellular shirting, bleached or dyed.

ANNEX A

(*Foreword*)

COMPARISON OF DESIGNATIONS OF SEWING MACHINE NEEDLES

Sl No.	Class 15 × 1 System	Numbering Metric System (International System 705)
(1)	(2)	(3)
i)	9	65
ii)	11	75
iii)	14	90
iv)	16	100
v)	18	110
vi)	19	120
vii)	21	130

ANNEX B

(*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*)**
Research & Development Centre for Bicycle and Sewing Machines, Ludhiana	SHRI PAPINDER SINGH SHRI VISHWAS MEHTA (*Alternate* I) SHRI MANPREET SINGH (*Alternate* II)
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 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, Pune	SHRI BHARAT NARAYENDAS PARMAR SHRI ARJUN BHARAT PARMAR (*Alternate*)
Office of Development Commissioner (MSME), New Delhi	SHRI SUVANKAR SANTRA MS MAITREYEE TALAPATRA (*Alternate*)
ORAA International, Ludhiana	SHRI ASHISH GUPTA
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*)

Organization	*Representative*(*s*)
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) [REPRESENTING DIRECTOR GENERAL (*Ex-officio*)]

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

Bureau of Indian Standards

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Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the website-www.bis.gov.in or www.standardsbis.in.

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