भारतीय मानक ब्यूरो

*भारतीय मानक* मसौदा

# वस्त्रादि — सूती सिलाई के धागे — विशिष्टि

(आई एस 1720 का *तीसरा पुनरीक्षण*)

**BUREAU OF INDIAN STANDARDS**

Draft *Indian Standard*

# Textiles — Cotton Sewing Thread — Specification

**(*Third Revision* of IS 1720)**

**ICS 59.080.20**



Last date for receipt of comment is 09 April 2023

Man-made Fibres, Cotton and their Products Sectional Committee, TXD 31

FOREWORD
(Formal clauses will be added later)

This standard was originally published in 1960 and was subsequently revised in 1968 and 1978.

Annex B gives the general end uses of each variety of sewing thread to assist the users of this standard in the proper choice of sewing threads.

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 : 1960 ‘Rules for rounding off numerical values (*revised*)’. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

## 1 SCOPE

**1.1** This standard prescribes constructional details and other particulars of 43 varieties of cotton sewing threads, unbleached, bleached or dyed.

**1.2** This standard does not specify the type of finish and feel of the sewing thread, nor does it specify the degree of whiteness of the bleached thread or the colour of the dyed threads.

## 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 edition of the standards indicated in Annex A.

## 3 MANUFACTURE

**3.1 Yarn** — Cotton yarn used in the manufacture of the sewing thread shall be evenly spun with suitable number of turns per metre so that a balanced thread is produced. It shall be reasonably free from spinning defects.

**3.2 Sewing Thread** — The sewing thread shall be reasonably free from knots, snarls and doubling defects.

**3.3 Direction of Twist** — Unless agreed otherwise, the direction of twist in the singles and the finished sewing thread shall be at the discretion of the manufacturer,

**3.4 Finish** — White sewing thread shall have a uniform bleached finish. The dyed sewing threads shall have the required shade and free from all dyeing defects.

NOTE — Sulphur dyes shall not be used when specifically required by the buyer. In case of supplies to the Ministry of Defence establishments, the black shade shall not be obtained by using sulphur dyes.

**3.4.1** The threads shall be finished soft, mercerized or polished as required. The finishing and dressing materials liable to cause subsequent tendering shall not be used.

**3.5 Working** — The sewing threads shall work satisfactorily on all appropriate types of hand and power driven sewing machines.

## 4 REQUIREMENTS

**4.1 Length (m/kg) and Breaking Load** — The sewing threads shall comply with the requirements given in Table 1.

**Table 1 Requirements of Cotton Sewing Threads**

(*Clause* 4.1)

| **Variety No.** | **Nominal Count Cotton Count (dtex)** | **Construction** | **Length** m/kg, *Min* | **Single Thread Breaking Strength on 50 cm Test Length**, N **(**kgf), *Min* |
|---|---|---|---|---|

| (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|
| 1 | 12s/2 (500 dtex × 2) | 2 ply (2 strands, each single) | 9 530 | 16.2 (1.65) |
| 2 | 28s/2 (210 dtex × 2) | 2 ply (2 strands, each single) | 22 020 | 6.9 (0.70) |
| 3 | 30s/2 (200 dtex × 2) | 2 ply (2 strands, each single) | 24 560 | 6.4 (0.65) |
| 4 | 38s/2 (155 dtex × 2) | 2 ply (2 strands, each single) | 31 340 | 6.7 (0.68) |
| 5 | 40s/2 (145 dtex × 2) | 2 ply (2 strands, each single) | 33 030 | 6.4 (0.65) |
| 6 | 6s/3 (1 000 dtex × 3) | 3 ply (3 strands, each single) | 3 100 | 68.6 (7.00) |
| 7 | 10s/3 (590 dtex × 3) | 3 ply (3 strands, each single) | 5 220 | 40.2 (4.10) |
| 8 | 12s/3 (500 dtex × 3) | 3 ply (3 strands, each single) | 6 340 | 27.0 (2.75) |
| 9 | 16s/3 (370 dtex × 3) | 3 ply (3 strands, each single) | 8 200 | 20.1 (2.05) |
| 10 | 24s/3 (250 dtex × 3) | 3 ply (3 strands, each single) | 12 900 | 15.7 (1.60) |
| 11 | 32s/3 (185 dtex × 3) | 3 ply (3 strands, each single) | 16 940 | 13.7 (1.40) |
| 12 | 40s/3 (145 dtex × 3) | 3 ply (3 strands, each single) | 21 510 | 9.8 (1.00) |
| 13 | 6s/3 (1 000 dtex × 3) | 3 ply (3 strands, each single) | 27 100 | 7.6 (0.78) |
| 14 | 6s/3 (1 000 dtex × 3) | 3 ply (3 strands, each single) | 27 100 | 8.8 (0.90) |
| 15 | 60s/3 (100 dtex × 3) | 3 ply (3 strands, each single) | 32 690 | 6.6 (0.67) |
| 16 | 80s/3 (74 dtex × 3) | 3 ply (3 strands, each single) | 43 520 | 5.1 (0.52) |
| 17 | 100s/3 (59 dtex × 3) | 3 ply (3 strands, each single) | 53 680 | 4.0 (0.41) |
| 18 | 6s/4 (1 000 dtex × 4) | 4 ply (4 strands, each single) | 2 330 | 98.0 (10.00) |
| 19 | 12s/4 (500 dtex × 4) | 4 ply (4 strands, each single) | 4 725 | 19.6 (2.00) |
| 20 | 24s/4 (250 dtex × 4) | 4 cord (2 strands, each 2 fold) | 9 310 | 20.6 (2.10) |
| 21 | 32s/4 (185 dtex × 4) | 4 cord (2 strands, each 2 fold) | 12 100 | 17.2 (1.75) |

| | | | | |
|---|---|---|---|---|
| 22 | 40s/4 (150 dtex × 4) | 4 cord (2 strands, each 2 fold) | 15 120 | 12.7 (1.30) |
| 23 | 50s/4 (120 dtex × 4) | 4 cord (2 strands, each 2 fold) | 19 050 | 9.8 (1.00) |
| 24 | 60s/4 (100 dtex × 4) | 4 ply (4 strands, each single) | 24 200 | 8.8 (0.90) |
| 25 | 80s/4 (74 dtex × 4) | 4 ply (4 strands, each single) | 32 180 | 6.9 (0.70) |
| 26 | 6s/5 (1 000 dtex × 5) | 5 ply (5 strands, each single) | 1 850 | 113 (11.5) |
| 27 | 32s/6 (185 dtex × 6) | 6 cord (3 strands, each 2 fold) | 8 150 | 25.5 (2.60) |
| 28 | 36s/6 (165 dtex × 6) | 6 cord (3 strands, each 2 fold) | 9 070 | 22.1 (2.25) |
| 29 | 40s/6 (145 dtex × 6) | 6 cord (3 strands, each 2 fold) | 10 720 | 21.1 (2.15) |
| 30 | 50s/6 (120 dtex × 6) | 6 cord (3 strands, each 2 fold) | 13 550 | 16.7 (1.70) |
| 31 | 60s/6 (100 dtex × 6) | 6 cord (3 strands, each 2 fold) | 15 120 | 32.2 (1.35) |
| 32 | 80s/6 (74 dtex × 6) | 6 cord (3 strands, each 2 fold) | 21 170 | 10.8 (1.10) |
| 33 | 100s/6 (59 dtex × 6) | 6 cord (3 strands, each 2 fold) | 26 250 | 8.8 (0.90) |
| 34 | 6s/8 (1 000 dtex × 8) | 8 ply (8 strands, each single) | 1 150 | 165 (16.8) |
| 35 | 22s/9 (270 dtex × 9) | 9 cord (3 strands, each 3 fold) | 3 700 | 54.9 (5.60) |
| 36 | 24s/9 (250 dtex × 9) | 9 cord (3 strands, each 3 fold) | 4 050 | 49.0 (5.00) |
| 37 | 32s/9 (185 dtex × 9) | 9 cord (3 strands, each 3 fold) | 5 500 | 40.2 (4.10) |
| 38 | 40s/9 (145 dtex × 9) | 9 cord (3 strands, each 3 fold) | 6 800 | 31.4 (3.20) |
| 39 | 50s/9 (120 dtex × 9) | 9 cord (3 strands, each 3 fold) | 8 400 | 26.0 (2.65) |
| 40 | 6s/10 (1 000 dtex × 10) | 10 ply (10 strands, each single) | 900 | 191 (19.5) |
| 41 | 20s/27 (300 dtex × 27) | 27 cord (3 strands, each 9 fold) | 1 130 | 169 (17.25) |
| 42 | 36s/27 (165 dtex × 27) | 27 cord (3 strands, each 9 fold) | 2 020 | 98.0 (10.0) |
| 43 | 24s/45 (250 dtex × 45) | 45 cord (3 strands, each 15 fold) | 805 | 255 (26.0) |

| | | | |
|---|---|---|---|
| **Method of Test** | - | C-3 | IS 1670 |

NOTE — The minimum breaking strength values and minimum length in metres per kilogram specified in this table shall apply to sewing threads irrespective of the type of finish.

**4.2 Colour Fastness** — The dyed threads with colour declared as fast shall conform to the requirements given in Table 2.

**Table 2 Requirements for Colour Fastness**
(*Clause* 4.2)

| **Sl No.** | **Characteristic** | **Requirement** | **Method of Test** |
|---|---|---|---|
| (1) | (2) | (3) | (4) |
| i) | Colour fastness to light (*see* Notes) | 5 or better | IS/ISO 105-B01 or IS/ISO 105-B02 |
| ii) | Colour fastness to washing | 4 or better | IS/ISO 105-C10 [Test Number D (4)] |
| iii) | Colour fastness to perspiration | 4 or better | IS/ISO 105-E04 |

NOTES

**1** In case of dispute, the colour fastness to light shall be determined by the method prescribed in IS/ISO 105-B01.

**2** In case of supplies to the Ministry of Defence establishments, the colour fastness to light shall be 6 or better.

**4.3 Cuprammonium Fluidity —** The cuprammonium fluidity of sewing thread shall not be more than 8 rhes when determined by the method given in IS 244.

**4.4 Length/Mass of Sewing Thread —** The average length and mass of sewing thread in a tube, reel or cone shall not be less than that marked on the label. However, a tolerance of minus two percent shall be permitted on an individual package.

**4.4.1** The length/mass of sewing thread shall be determined by the method given in **C-4**.

**4.5 Special Proofed Threads —** In case the sewing threads are required to be used in the manufacture of ammunition, armaments, etc, these shall be specially proofed and shall comply with the additional requirements given in Table 3.

**Table 3 Requirements of Special Proofed Cotton Sewing Threads**

(*Clause* 4.5)

| Sl No. | Characteristic | Requirement | Method of Test |
|---|---|---|---|
| (1) | (2) | (3) | (4) |
| A) *Chemical Requirements* | | | |
| i) | *p*H value of water extract | 5.5 to 7.5 | IS 1390 |
| ii) | Water soluble matter: | | IS 3456 |
| | a) Unproofed | 0.5 percent, *Max* | |
| | b) Proofed | 1.0 percent, *Max* | |
| iii) | Water soluble chlorides calculated as NaCl | 0.05 percent, *Max* | IS 4202 |
| iv) | Water soluble sulphates calculated as $Na_2SO_4$ | 0.25 percent, *Max* | IS 4203 |
| v) | Ash on incineration (in excess of ash due to proofing agents) | 0.20 percent, *Max* | IS 199 |
| B) *Requirements Related to Proofing* | | | |
| vi) | Salicylanide content (for salicylanide processed) | 0.1 percent, *Min* | |
| vii) | Copper content (for copper cutch processed) | 0.7 percent, *Min* | |
| viii) | a) Chromium content (for chrome copper processed) | 0.5 to 1.5 percent | IS 3522 (Part 1) and (Part 2) |
| | b) Copper content (for chrome copper processed) | 0.2 percent, *Min* | |
| ix) | Chromium content (for chrome processed) | 0.7 to 1.0 percent | |
| x) | Chromium and iron | 1.5 percent, *Min* | |

## 5 PACKAGING

**5.1** The sewing thread shall be made up in the form of tubes, reels. cones or in any other form as required. The free end of the thread shall be securely fastened to prevent unravelling.

**5.2** Unless otherwise specified, sewing thread shall be packed in accordance with the provisions of IS 1066.

## 6 MARKING

**6.1** Each unit package of sewing thread shall be marked preferably on a label with the following information:

a) Name of the material;
b) Nominal count or ticket number;
c) The length or weight of thread in a unit package;
d) Year of manufacture; and
e) Manufacturer's name, initials or trade-mark, if any.

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

## 7 SAMPLING

**7.1** **Lot** — The quantity of cotton embroidery thread of the same variety delivered to a buyer against a despatch note shall constitute the lot.

**7.2** The conformity of the lot to the requirements of this standard shall be determined on the basis of the tests carried out on the samples selected from the lot. To ensure the randomness of selection, IS 4905 may be followed.

**7.3** Unless otherwise agreed to between the buyer and the seller, the number of packs to be selected at random from a lot shall be as follows:

| *Number of Packs in the Lot* | *Number of Packs to be Selected* |
|---|---|
| up to 15 | 5 |
| 16 to 30 | 7 |
| 31 to 50 | 10 |
| 51 to 100 | 15 |

| | |
|---|---|
| 101 to 300 | 25 |
| 301 and above | 30 |

**7.4** One tube or reel shall be selected at random from each of the pack selected according to **7.3**. The tube, reel or ball thus selected shall constitute the test sample for determining:

a) length in m/kg,
b) breaking load,
c) balance of twist, and
d) length per tube or reel (subject to a minimum of 20 samples).

**7.4.1** For testing colour fastness, cuprammonium fluidity and requirements for special proofed threads, two specimens of the required size for a lot size of 30 packs or less, and 3 specimens for a lot size of more than 30 packs shall be taken from the tubes, reels or balls drawn in accordance with **7.4** and tested individually.

**7.5 Criteria for Conformity** — The lot shall be declared as conforming to the requirements of this standard if the following conditions are satisfied:

a) From the test results for lengths or breaking load, the average $X$ and the range $R$ or average range $R$ shall be calculated and the value of the expression ( $X - 0.4\ R$) is greater than or equal to the relevant value specified.

NOTE — When the number of test results is 10 or more, they shall be grouped in groups of five. The mean range $R$ is the value obtained by taking the average of the ranges of the groups.

b) All the test specimens tested for colour fastness, cuprammonium fluidity and requirements for special proofed threads satisfy the relevant requirements.
c) The average of the length/mass measurements is not less that the marked length.

## ANNEX A
(*Clause* 2)

## LIST OF REFERRED INDIAN STANDARDS

| *IS No.* | *Title* |
|---|---|
| 199 : 1989 | Textiles — Estimation of moisture, total size or finish, ash and fatty matter in grey and finished cotton textile materials (*third revision*) |
| 244 : 1984 | Method for determination of viscosity or fluidity of solutions of cotton and regenerated cellulosic man-made fibres in cuprammonium hydroxide (*second revision*) |
| 1066 : 1980 | Code for packing of sewing threads (*first revision*) |
| 1390:2022 | Textiles — Determination of *p*H of aqueous extract (*third revision*) |
| 1670 : 1991 | Textiles — Yarn – Determination of breaking load and elongation at break of single strand (*second revision*) |
| 3456 : 2022 | Method for determination of water soluble matter of textile materials (*first revision*) |
| 3522 (Part 1) : 1989 | Methods for estimation of common preservatives on textiles – Part 1 (*first revision*) |
| 3522 (Part 2) : 1989 | Methods for estimation of common preservatives on textiles – Part 2 (*first revision*) |
| 4202 : 2022 | Method for determination of chloride content of textile materials (*first revision*) |
| 4203 : 2022 | Method for determination of sulphate content in textile materials (*first revision*) |
| 4905 : 2015 | Random sampling and randomization procedures (*first revision*) |
| 6359 : 1971 | Method for conditioning of textiles |
| IS/ISO 105-B01 : 2014 | Textiles — Tests for colour fastness — Part B01 Colour fastness to light: Daylight |
| IS/ISO 105-B02 : 2014 | Textiles — Tests for colour fastness — Part B02 Colour fastness to artificial light: Xenon arc fading lamp test |
| IS/ISO 105-C10 : 2006 | Textiles — Tests for colour fastness Part C10 Colour fastness to washing with soap or soap and soda |
| IS/ISO 105-E04 : 2013 | Textiles — Tests for colour fastness Part E04 Colour fastness to perspiration (*first revision*) |

## ANNEX B

(*Foreword*)

## GENERAL END USES

| *Variety No.* | *General End Uses* |
|---|---|
| 1 | Embroidery of emblems, insignia, etc. |
| 2 | Basting, hemming and stitching of light clothing and cables |
| 3 | – do – |
| 4 | Clothing and hosiery |
| 5 | Clothing, hosiery and cables |
| 6 | Heavy leather and canvas material, such as tarpaulins, canopies, ankle boot uppers, harness and saddlery, bag closing, harness for jacquard looms and page-cord |
| 7 | Gloves, tents, harness and saddlery |
| 8 | Light leather materials and for repair work |
| 9 | Light leather materials, selvedge yarn in jute cloth |
| 10 | Woollen jerseys, woollen pullovers, caps, wool-cotton short-drawers and wool-cotton vests |
| 11 | Chappal uppers, shoes and book-binding |
| 12 | Clothing, towels, household linen and hosiery |
| 13 | – do – |
| 14 | Synthetic and blended fabrics |
| 15 | Clothing, handkerchiefs, towels and hosiery |
| 16 | – do – |
| 17 | Handkerchiefs, hosiery and clothing |
| 18 | Heavy leather, canvas, tarpaulin, canopies, boot uppers, harness and saddlery, bag closing and harness for jacquard looms |
| 19 | Hand stitching of tentage and repair of door curtains |
| 20 | Umbrellas, healds, fishnets, book-binding, carpets, and woven and knitted heavy fabrics |
| 21 | Umbrellas, book-binding, healds and bags |
| 22 | Umbrella, chappal uppers, bags, book-binding, clothing and healds |
| 23 | Clothing, umbrellas, chappal uppers and healds |
| 24 | Clothing |
| 25 | Clothing and jari trade |
| 26 | Boot uppers, sole and welt |
| 27 | Book-binding, bags, tents, carpets, fishnets, healds and selvedging |
| 28 | Book-binding, bags, tents, carpets, fishnets, healds, selvedging, canvas and footwear uppers |
| 29 | Leather footwear uppers |
| 30 | – do – |
| 31 | Leather footwear uppers, piece-end joining and clothing |
| 32 | Footwear and clothing |
| 33 | Clothing |
| 34 | Sole, welt and shoes uppers |
| 35 | Boots and shoe uppers, sole and welt, sports and travel goods, |

| | |
|---|---|
| | upholstery, spindle tape, book-binding, jari-making, harness for jacquards and light tarpaulins |
| 36 | – do – |
| 37 | Leather and canvas material, spindle tape, upholstery, sports goods and jari |
| 38 | Shoe uppers, upholstery, light leather and canvas materials and book-binding |
| 39 | Book sewing, upholstery, spindIe tape and light leather materials |
| 40 | Sole stitching of heavy boots |
| 41 | Healds, tarpaulins and canopies |
| 42 | – do – |
| 43 | Healds and meteorological radiosonde/Rawin balloons |

## ANNEX C

(*Clause* 4.4.1 and *Table* 1)

## METHODS OF TEST

### C-l CONDITIONING OF TEST SPECIMENS AND ATMOSPHERIC CONDITIONS FOR TESTING

**C-l.1** The test specimens shall be conditioned and tested in the standard atmosphere of 65 ± 2 percent relative humidity and 27 ± 2°C temperature (*see* IS 6359).

### C-2 APPARATUS

**C-2.1 Wrap Reel** — having a perimeter of 1 m ± 0.4 percent. Determine the actual perimeter of the reel with a strip of gummed paper passed tightly around the reeI and secured by adhesion at the overlap. Cut the paper strip and measure its length to an accuracy of 0.1 percent.

**C-2.2 Adjustable Yard Tensioning Device** — capable of giving a reeling tension that wilI result in skeins of the specified length when measured under a load of 0.5 gf /tex.

**C-2.3 Weighing Balance** — capable of weighing skeins in grams and with a sensitivity of 1 part in 500.

### C-3 DETERMINATION OF LENGTH (m/kg)

**C-3.1** Place the package constituting the test specimen on the wrap reel (*see* **C-2.1**) and wind 100 m of thread under a suitable reeling tension (*see* **C-2.2**). Remove the thread so wound from the wrap reel and determine the mass on the weighing balance (*see* **C-2.3**).

**C-3.2 Calculation** — Calculate the length, m/kg, by the following formula:

$$\text{Length, m/kg} = \frac{100 \times 1000}{W_1}$$

where,

$W_1$ = mass in g of 100 m of sewing thread.

**C-3.3** Similarly determine the length (m/kg) of other test specimens.

## C-4 DETERMINATION OF LENGTH/MASS OF SEWING THREAD ON REEL/TUBE/CONE OR ANY PACKAGE

**C-4.1** Place the package constituting the test specimen on the wrap reel and wind it into skein till the whole test specimen is exhausted. Remove the skein and determine the mass on the weighing balance.

**C-4.2** Similarly determine the mass of other test specimens.

**C-4.3** Determine the length of sewing thread of reel/tube/cone or any package by the following formula:

$$\text{Length, m} = \frac{a \times W_2}{1\,000}$$

where

$a$ = length in m/kg (*see* **C-3.2**), and

$W_2$= mass of sewing thread on the package (*see* **C-4.1**).