भारतीय मानक ब्यूरो
BUREAU OF INDIAN STANDARDS

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भारतीय मानक मसौदा

वस्त्रादी - सिंगल जर्सी व रिब से बुना हुआ यूनिसेक्स पाजामा - विशिष्टि

Draft Indian Standard

TEXTILES — SINGLE JERSEY AND RIB KNITTED UNISEX PYJAMA — SPECIFICATION

Hoisery Sectional Committee, TXD 10	Last date for receipt of comments is 16 September 2025

FOREWORD

(*Formal clauses to be added later*)

Knitted pyjama are loose-fitting nightwear garments. They are worn by both men and women across a variety of environments, including domestic, travel, and casual loungewear applications.

These garments are generally produced on circular or flat knitting machines using structures such as single jersey, rib, interlock, or fleece-back constructions. They are manufactured from natural fibres (e.g., cotton), synthetic fibres, or their blends, with optional incorporation of elastomeric yarns to enhance fit and fabric recovery. Functional features such as elasticated waistbands, drawcords, cuffs, and plackets may be produced using alternative knit structures or adjusted stitch densities to optimize comfort, ease of dressing, and durability.

This standard specifies the dimensional tolerances, structural parameters, and minimum performance requirements for knitted pyjama.

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.

1 SCOPE

1.1 This standard prescribes the constructional details and other particulars of single jersey, rib and interlock, cotton, synthetic/ regenerated cellulose, and blended knitted unisex pyjama.

1.2 This standard does not specify the general appearance, feel, shade, texture, etc. of the pyjama.

1.3 This standard does not apply to knitted interlinings, jeans, and dungarees.

2 REFERENCES

2.1 The standards listed in Annex A, 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.

2.2 For the purpose of this standard the definitions given in Annex B, Annex C, and Annex D shall apply.

3 TERMINOLOGY

3.1 Knitted pyjama are a popular choice for sleepwear and loungewear due to their comfort and flexibility. Pyjama are typically made from cotton, modal, bamboo, tencel/lyocel or a blend of fabrics, knitted pyjama are soft and breathable, ensuring comfort throughout the night. The knitted fabric allows for stretch, making them easy to move in, which is especially beneficial for sleep. The Knitted pyjama can provide warmth without being overly heavy, making them suitable for cooler climates. Available in various styles and a range of designs including; coordinated tops, bottoms, from solid colors to fun prints and patterns, catering to different tastes.

Many feature elastic waistbands, adjustable drawstrings, and gussets for added comfort and fit. The fabric allows air circulation, helping to regulate body temperature as well as some materials have ability to extract moisture away from the skin, keeping you dry. Knitted Pyjama are an excellent investment for comfort and style, whether for sleep or casual lounging.

4 MATERIALS

4.1 Yarn

The yarn count used in manufacturing knitted pyjama can vary depending on the desired characteristics of the fabric, such as softness, durability, and thickness. Pyjama use blends of polyester, nylon, and natural fibers like cotton or modal to enhance comfort and performance. The yarn count for cotton shall be in the range of 20s Ne – 60s Ne (30 Tex – 12 Tex) and for multifilament synthetic and blended yarn shall be in the range of 20D – 150D. Apart from this specification, any other yarn count as per the agreement between the buyer & the seller shall be used for knitting, splicing, and linking of the pyjama.

4.2 The material used for manufacturing pyjama shall be tested as per Annex B.

5 MANUFCTURE

5.1 Shape

The shape of Pyjama shall be generally as shown in Figure 1A & Figure 1B

5.2 Fabric Manufacturing

5.2.1 The pyjama fabric shall be knitted on circular and flatbed machines. These shall be neatly tailored out of well and evenly knitted tubular fabric. The fabric shall be of uniform texture and appearance.

It shall be of uniform tension throughout its length and free from spirals. It shall be scoured, bleached or dyed. The pyjama shall not have any seams or joining along their two outer sides. The wales shall run along the length of the pyjama. The fabric shall conform to construction particulars given in Table 1 for plain knitted pyjama and Table 2 for rib knitted pyjama.

5.2.2 Pockets, if required may also be provided having dimensions and shape as per the agreement between the buyer and the seller. (*see* Figure 1B).

5.2.3 Ankle Fit Pyjama, if required may also be provided having dimensions and shape as agreed to between the buyer and seller (*see* Figure 1B).

5.2.4 Draw strings, if required may also be provided as agreed to between the buyer and the seller (*see* Figure 1B).

5.3 Elastic Strap

Pyjama shall have outer woven elastic strap stitched at the waist band or inner woven elastic strap shall be formed by the folding the raw edges of the fabric to a depth of minimum 25 mm and stitching it with flat stitches. In case of latter, a cotton tape having width of minimum 25 mm preferably confirming to IS 9686: 1980 or a suitable tape made out of same fabric that is used for fabricating the pyjama shall be provided in waist fold for tying purposes. It shall be at least 30 cm longer than the corresponding waist girth.

The ankle and waistband should be either plain or rib knitted or as per the agreement between the buyer and the seller. The ankle width shall be a minimum of 5.0 cm and the waistband width shall be a minimum of 2.5 cm.

5.4 Crutch Piece

The fabric used for crutch piece shall be of same type and construction as that of the pyjama (leg portion). The crutch piece shall be reinforced throughout with cotton calico (IS 1544). The crutch piece and the reinforcement fabric shall be scoured or bleached as the pyjama.

5.5 Linking

The pieces of pyjama shall be securely linked using over-lock and or flat-lock stitch. The stitch type selection must be as per the agreement with the buyer and the seller. The linking shall be elastic, smooth and free from knots. The length of the free ends of the linking yarn and other loose ends, if any, shall be neither less than 5.0 mm nor more than 15.0 mm. The linking shall not give way when the Pyjama are stretched without breaking to the full extent of the stretch ability of Pyjama. Linking of crutch piece shall be done at right angle i.e. 90º at the intersection to prevent tearing during extension while sitting.

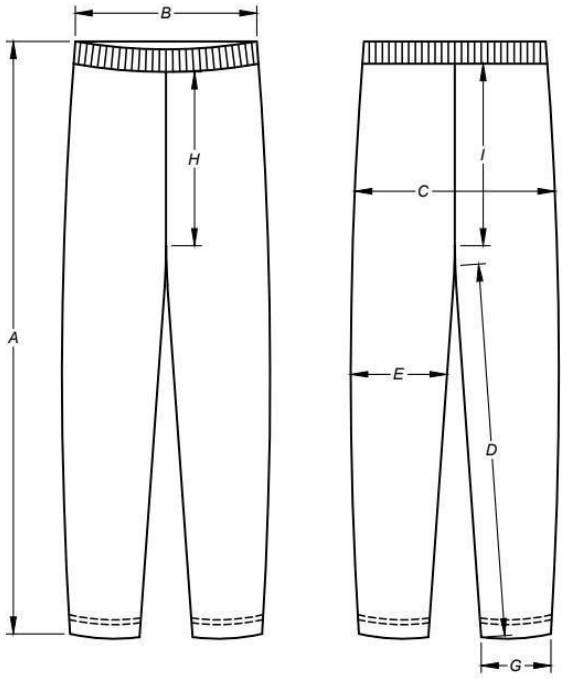

Figure 1(A) General Shape of Knitted Pyjama

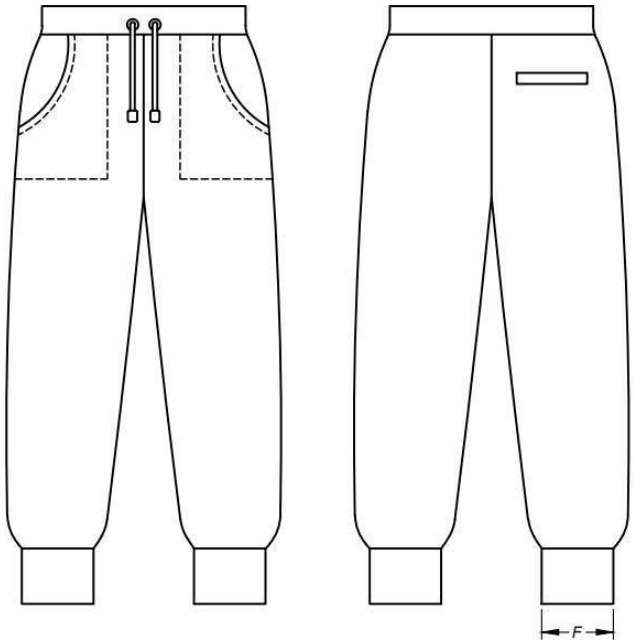

Figure 1 (B) - General Shape of Ankle Fit Knitted Pyjama

Table 1 Constructional Particulars of Plain Knitted Fabric for Pyjama
(*Clause* 5.1)

Sl. No.	**Gauge of Machine (*see* Note)**	**Approximate Count of Yarn – Ne (Tex)**	**Mass (g/m2) Min**
(1)	(2)	(3)	(4)
1	12 - 18	20s (30.0) – 28s (21.0)	250
2	24 - 28	30s (19.5) – 40s (14.5)	230
3	28 - 32	34s (17.0) – 50s (12.0)	200
4	32 - 36	40s (14.5) – 50s (12.0)	160
5	36 - 40	50s (12.0) – 60s (10.0)	120
NOTE — As determined by the number of needles per 2.54 CM			

Table 2 Constructional Particulars of Rib Knitted Fabric for Pyjama
(*Clause* 5.1)

Sl. No.	**Gauge of Machine (See Note)**	**Approximate Count of Yarn – Ne (Tex)**	**Mass (g/m2) Min**
(1)	(2)	(3)	(4)
1	12 – 18	20s (30.0) – 28s (21.0)	350
2	18 – 24	30s (19.5) – 40s (14.5)	320
3	24 – 28	34s (17.0) – 50s (12.0)	260
4	28 – 32	38s (15.5) – 50s (12.0)	230
5	32 – 36	50s (12.0) – 60s (10.0)	200
NOTE — As determined by the number of needles per 2.54 CM			

Table 3 Body Measurements Chart for Pyjama (Figure 1A & 1B)

(*Clause* 5.1)

Sl No.	**Size**	**Length** cm	**Waist** cm		**Hip** cm		**Inseam** cm	**Thigh** cm		**Ankle** cm		**Bottom Leg Opening** cm
		(A)	**(B)**		**(C)**		**(D)**	**(E)**		**(F)**		**(G)**
			Women's	**Men's**	**Women's**	**Men's**		**Women's**	**Men's**	**Women's**	**Men's**	**---------**
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(13)	(14)	(15)
i)	XS	90	61 – 66	71 – 76	81 – 86	86 – 91	64	46	52	18.0	22.0	30
ii)	S	94	68 – 72	76 – 81	86 – 91	91 – 97	66	48	54	19.0	22.5	33
iii)	M	96	74 – 76	81 – 86	91 – 97	97 – 102	68	50	55	20.0	23.0	34
iv)	L	100	79 – 81	86 – 91	97 – 102	102-107	70	52	57	21.0	23.5	35
v)	XL	102	84 – 86	91 – 97	102 – 107	107-112	72	54	58	22.0	24.0	36
vi)	2XL	104	89 – 91	97 – 102	107 – 112	112 – 117	74	56	60	23.0	25.0	37
vii)	3XL	108	94 – 99	102 – 107	112 – 117	117 – 122	76	58	62	24.0	26.0	38
viii)	4XL	110	100 – 104	107 – 112	117 – 122	122 – 127	78	60	64	25.0	27.0	39
ix)	5XL	112	106 – 110	112 – 117	122 – 127	127 – 132	80	62	66	26.0	28.0	40
x)	6XL	116	112 – 118	117 – 122	127 – 132	132 – 137	82	64	68	27.0	29.0	41
xi)	7XL	120	118 – 124	122 – 127	132 – 137	137 – 142	84	66	70	28.0	30.0	42
xii)	8XL	124	124 – 130	127 – 132	137 – 142	142 – 147	86	68	72	30.0	32.0	43

Table 4 Body Measurements Chart for Pyjama (Figure 1A)

(*Clause* 5.1)

Sl No.	**Pyjama Particulars**	**Front Rise** (cm)		**Back Rise** (cm)	
		(H)		**(I)**	
		Women's	**Men's**	**Women's**	**Men's**
i)	Low Rise Pyjama	18 - 20	20 - 23	25 - 28	25 - 28
ii)	Mid Rise Pyjama	20 - 25	23 - 27	28 – 32	28 – 32
iii)	High Rise Pyjama	25 - 30	27 - 30	32 - 36	32 - 36
NOTE — Measurements Shall Apply to All Sizes of Pyjama					

6 FREEDOM FROM DEFECTS

The Pyjama shall be reasonably free from the manufacturing defects, such as large mends, ladders, dropped stitches, holes, improper splicing and chemical damages. The dyed and bleached pyjama shall be free from dyeing defects, such as streakiness and uneven dyeing and the white pyjama from blueing agents.

7 REQUIREMENTS

7.1 Dimension, Mass and Tolerances

The pyjama fabric shall conform to the requirements of Table 1 and Table 2 considering the type of fabric used with tolerances typically ±0.5 cm to ± 2.0 cm.

NOTE — The Pyjama size should be denoted by the number correspond to the length and waist diameter.

7.2 Seam and Stitching Tolerances

a) **Seam allowances** - Maintain consistent seam allowances (typically 0.6 cm to 1.5 cm) to ensure adequate construction and durability.

b) **Stitch quality** - Specify acceptable variations in stitch length, tension, and type such as; Lockstitch, Over-lock, or Cover-stitch; to ensure seams is secure and aesthetically pleasing.

7.3 Sewing Thread and Stitch Type

The stitch type details of the pyjama shall be as under along with sewing thread as per IS 9543 and IS 1720.

Sl No.	Portion to be Stitched	Type of Stitch	Sewing Thread
i)	All Joining's	Flat – Lock	Three threads of 60s/3 count (100 dtex x 3) or 40s/2 count (145 dtex x 2) in the needle and one strand of the same threads in the each loopers.
ii)	Flap at the front opening (For Men's Only)	Lock Stitch	One strand of cotton sewing thread of 60s/3 count (100 dtex x 3) or 40s/2 count (145 dtex x 2) in each of the needle and the looper.
NOTE — Sewing thread of 60s/3.0 (100 dtex) count may be used in place of 40s/2 (145 dtex x 2)			

7.4 Sealed Sample

If in order to illustrate or specify general appearance, luster, handle, type of finish and whiteness index or yellowness (ISO 105: J02, ISO 11475:2017), a sample has been agreed upon and sealed, the supply shall be in conformity with the sample in each respect.

8 MARKING

8.1 Each Pair of Pyjama shall be marked with the following

a) Size (marked toward the waistband);
b) manufacturer's name, initials or trademark, if any (marked on the waistband);
c) fibre blend compositions must be given;
d) suitable post-care instruction must be given; and
e) Any other information as required by the law in force must be listed.

9 BIS CERTIFICATION

The Product(s) conforming to the requirements of this standard may 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.

Table 5 Other Requirements of Pyjama
(*Clause* 5.2)

Sl No.	Characteristic	Requirements	Method of Test, Ref to
(1)	(2)	(3)	(4)
i.	Total number of Wales/dm	150 - 300	B-4
ii.	Total number of Courses/dm	180 - 350	B-4
iii.	Dimensional Change (due to relaxation) Percentage, *Max*	5.0	B-5
iv.	pH value	6 - 10	IS 1390
v.	Water soluble, *Min*	1.0	IS 3456
vi.	Ash Content	0.5	IS 199
vii.	Colour fastness ratings to min		
	i. Light	3 - 4	IS/ISO 105 – B02 OR IS/ISO 105 – B01
	ii. Washing a) Change in colour b) Staining of Adjacent fabric	4 4	IS/ISO 105 – C10
	iii. Perspiration a) Change in Colour b) Staining of adjacent fabric	3 3	IS/ISO 105 – E04

	iv. Rubbing a) Change in colour b) Staining of adjacent fabric	4 3	ISO 105-X12
	v. Pilling (Martindale Pilling Box- 14400 Rev)	4 - 5	ISO 9943 : 2009
viii	Fibre Blend Compositions		IS 13719 : 2023

10 PACKING

The pyjama shall be packed as per the agreement between the buyer and seller.

11 SAMPLING

11.1 Lot

In any consignment, all the pairs of pyjama of the same size manufactured from the same quality of yarn shall constitute a lot (IS 2500).

11.2 The conformity of a lot to the specification shall be determined on the basis of the test carried out on the pairs of pyjama selected from the lot.

11.3 Unless otherwise agreed to between the buyer and the seller, number of pairs of Pyjama depending on the lot size, shall be selected at random according to the Col 1 and 2 of Table 6 & Table 7

11.4 The number of pairs of pyjama to be inspected and criterion for conformity for each characteristic shall be as follows:

Table 6 Performance Assessment criteria for Pyjama
(*Clause* 11.3)

Sl. No.	Characteristic	Number of pairs of Pyjama to be	Criterion for Conformity
(1)	(2)	(3)	(4)
i)	Visual inspection dimensions and number of wales and course	According to the col (3) of Table 7	Non-conforming pairs of pyjama shall not exceed the corresponding number given in col (4) of the Table 7
ii)	Mass	Sets of 10 pairs of pyjama obtained from those selected according to col (3) of Table 3	All the observations shall satisfy the relevant requirements
iii)	Dimension change, scouring loss, pH value, ash content and colour fastness	According to col (5) of Table 7	All the test results shall satisfy the relevant requirement

Table 7 Sample Size and Permissible Number of Non-Conforming pairs of Pyjama
(*Clause* 9.3 and 9.4)

Sl. No.	Number of pairs of Pyjama in the Lot	For Dimensions and visual Inspection		Testing
		Number of pairs of Pyjama to be Inspected	Number of permissible Non- Conforming Pairs	Number of pairs of Pyjama to be tested for Chemical Characteristics
(1)	(2)	(3)	(4)	(5)
i)	Up to 100	10	0	3
ii)	100 – 300	20	1	3
iii)	301 – 500	30	2	5
iv)	501 – 1000	50	3	5
v)	1001 and above	80	5	8

ANNEX A
(*Clause* 2)

LIST OF REFERRED STANDARDS

IS No.	*Title*
IS 199 : 1989	Textiles - Estimation of moisture, total size or finish, ash and fatty matter in grey and finished cotton textile materials
IS 1390 : 2022	Textiles Determination of pH of aqueous extract (Third Revision)
IS 3086 : 1965	Code for seaworthy packaging of cotton hosiery yarn and goods
IS 3325 : 1965	Code for inland packaging of cotton hosiery yarn and goods
IS 3456 : 2022	Method for determination of water-soluble. matter of textile materials (*First Revision*)
IS 3596 : 1967	Glossary of terms relating to hosiery
IS 6359 : 2023	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 w with soap or soda and soap
IS/ISO 105 – E04: 2008	Textiles: Tests for colour fastness – Part E04 colour fastness to perspiration
ISO 16373-3	Textiles. Dyestuffs – Method for determination of certain carcinogenic dyestuffs (method using tri-ethylamine/methanol)
BS EN ISO 14362-1,2,3	Textiles. Methods for determination of certain aromatic amines derived from Azo colorants - Textile testing; Amines (aromatic) ...
ISO 105 – NO2	Textiles - Test for colour fastness Part NO2: Colour fastness to bleaching- Peroxide
ISO 766 ISO 105-X12	Textiles - Method for determination of colour fastness of textile materials to rubbing [TXD 5: Chemical Methods of Test]
IS 667: 1981	Textiles fibres - Methods for identification of textile fibers
ISO 1833-1:2020	Textiles – Quantitative chemical analysis – Part 1: General principles of testing
IS-10971(P-2): 2022 ISO 12945-2:2020	Textiles – Determination of Fabric Propensity to Surface Fuzzing and to Pilling, Part 2: Modified Martindale Method
ISO 6989:1981	Textile fibres — Determination of length and length distribution of staple fibres (by measurement of single fibres)
IS 15336: 2003	Textiles – Acrylic Yarn for Hosiery – Specification
IS 13719:2003	Textiles Spun cotton regenerated cellulosic fiber blended grey yarn - Specifications
IS 9543:2019	Textiles – Spun polyester sewing thread – Specifications
ISO/TR 11827:2012	Textiles — Composition testing — Identification of fibres
ISO 10132:1993	Textiles – Textured filament yarn – Definitions

ISO 5688:2024	Textiles – Synthetic filament yarns - Test methods for crimp properties of Textured yarn

ISO 7211-5	Textiles- methods for the determination of linear density of yarn removed from fabric.
IS 13003: 1991	Textiles — Fabric, Cotton, Interlock knitted - Specification
IS 9469 : 2003	Textiles – Fabric, cotton, plain (Single jersey) knitted – Specification (second revision)
IS 834 : 2006	Textiles – Ring Spun Grey Cotton Yarn for Textiles
ISO 8559 - 1	Textiles – Size designation of clothes – Anthropometric definitions for body measurement
ISO 8559 - 2	Textiles Size designation of clothes Part 2: Primary and secondary dimension indicators
ISO 8559 - 3	Textiles Size designation of clothes Part 3: Methodology for the creation of body measurement tables and intervals
IS 1966-1 (2009)	Textiles — Bursting Properties of Fabrics - Determination of Bursting Strength and Bursting Distension, Part 1: Hydraulic Method [TXD 1: Physical Methods of Tests]
IS 1670 (1991)	Textiles—Yarn—Determination of breaking load and elongation at break of single strand [TXD 1: Physical Methods of Tests]
IS/ISO 16322 (1-3)	Determination of spirality of knitted fabrics post laundering.
ISO 6330	Textiles — Domestic washing and drying procedures for textile testing
IS 10099: 2020\ ISO 3759: 2011	Textiles — Preparation marking and measuring of fabric specimens and garments in tests for determination of dimensional change
IS 9686:2022	Textiles — Specification For Elastic Tape
IS 2500	Part 4,5 & 6 Sampling Procedures for inspection by attributes.
IS 14563 Part 2 ISO 14184-2 : 2011	Textiles — Determination of formaldehyde Part-2: Released formaldehyde vapour absorption method first revision.
IS 1720:2022	Textiles — Specification for cotton sewing threads
IS 1889(Part 1 - 4): 2024 ISO 1833-5:2006	Textiles — Quantitative Chemical Analysis: Mixtures of Viscose, Cupra or Modal and Cotton Fibres (Method Using Sodium Zincate)

ANNEX B

METHODS OF TEST

B-1 CONDITIONING OF THE TEST SPECIMEN AND ATMOSPHERIC COMDITIONS FOR TESTING

B-1.1 The test specimen shall be tested in prevailing atmospheric conditions. In case of dispute, the specimen shall be conditioned and tested in the standard atmosphere as given in IS 6359.

B-2 DIMENSIONS

B-2.1 Take pyjama from the test sample. Lay flat on a horizontal surface. Remove by hand all creases and wrinkles without distorting it. Measure dimensions correct to the nearest centimetre, as given in Table 8.

B-3 MASS

B-3.1 Take a set of 10 pairs of pyjama from the test sample. Condition them for moisture equilibrium for 24 hours (*see* **B-1.1**).

B-4 WALES AND COURSES

B-4.1 Take pyjama from the test sample. Lay it flat on a horizontal surface. Remove by hand all creases and wrinkles without distorting it.

B-4.1.1 Count the number of wales including any fraction on one side of the pyjama. Similarly count the number of wales including any fraction on other side of the pyjama and add the two values.

B-4.1.2 Count the number of courses in 10 cm including any fraction on both sides of the pyjama and calculate the average courses per decimetre.

B-5 DIMENSIONAL CHANGE (Due to Relaxation)

B-5.1 Marking the Test Specimens. Take pyjama from the test sample. Mark centrally on it, by means of indelible ink or fast dyed cotton sewing, a set of three points, namely, *X*, *Y* and, *Z* so that,

a) All the three points are on the same wale,
b) point *X* is on the top portion;
c) point *Y* is on the heel gore line; and
d) Point *Z* is on the toe portion.

B-5.2 Procedure

B - 5.2.1 Place the test specimen on a glass plate. Remove by hand all the creases and wrinkles without stretching the specimen. Place another glass plate on the specimen. Measure separately, correct to the nearest millimetre, the distance between *X* and *Y* and that between *Y* and *Z*.

B-5.2.2 Lay the test specimen flat in a tray of suitable size, having a depth of 10 cm. Soak the specimen under the head of 25mm of water containing 0.5 % of suitable wetting agent at room temperature for two hours. Drain out the water and remove the test specimen carefully so that it is not stretched. Lay the specimen flat on a smooth surface, remove the excess water by absorbent material and dry it at room temperature.

Note – Removal of excess water by wringing the test specimen is not permitted

B-5.2.3 After drying, conditioned the test specimen to moisture equilibrium at room temperature, place it on the glass plate, carefully remove wrinkles and creases and place another glass plate on it. Measure, correct to the nearest centimetre, the distance between *X* and *Y* and that between *Z*.

B-5.3 Calculation

B-5.3.1 Calculate separately, correct to one place of decimal, the percentage change between the points *X* and *Y* and that between *Y* and *Z* by following formula:

$$S = \frac{a-b}{a} \text{ x } 100$$

Whereas;

S = dimensional change (due to relaxation) percent;
a = distance between the two points X and Y, or Y and Z, before soaking; and
b = distance between the same points after soaking.

B-5.3.2 Calculate the average dimensional change**.**

B-6 SPIRALITY OF THE KNITTED FABRIC

Spirality is a major problem of knit fabrics which are produced in circular knitting machines. Relaxation of torsional stresses cause dimensional distortions and instability in the knitted loop constructions. The factors that influence the spirality include; machine gauge, no of feeders, yarn type and fabric properties, etc.

B–6.1 Measurement of Spirality after Laundering

Spirality is determined by placing a protractor on the smooth fabric surface with its base-line along the course and reading the angle between the wale line and a line 90°perpendicular to the course line.

B-6.2 Test Specimen Preparation and Marking Procedures

i. Prepare specimen for marking from appropriate location from the sample. Cut a specimen of size 380 mm x 380 mm single layer fabric.
ii. Place the test specimen on a glass plate with the technical face of the fabric upwards.
iii. Remove by hand all the creases and wrinkles without stretching the specimen.
iv. If necessary, place tensioning mass on either side of the fabric sample to keep the welt straight.

B-6.3 Procedure - Diagonal Marking

i. Mark two pairs of 250 mm benchmark sets parallel to the length and two pairs of 250 mm benchmark sets perpendicular to the width to make a square. Draw a line through each of the four sets of adjacent benchmark to denote the square formed.
ii. Label the four corners, A, B, C and D in clockwise direction starting at the lower left corner as shown in figure -3. Using the middle third of the specimen width, place the ruler or a straightedge parallel to the direction of wales in the fabric specimen.
iii. Choose one wale, and align and the straight edge of the ruler with that wale at the intersection between the body of the specimen and the welt. Keeping that point fixed, rotate the straightedge until it crosses the same wale at a position (200 ± 1) mm from the top of the welt.
iv. Without moving the straightedge, place the protector on the straightedge with the base line parallel to the top of the welt. Measure the angle between the line of the straightedge and the bottom of the protector which is parallel to the top of the welt. (*see* figure 3)

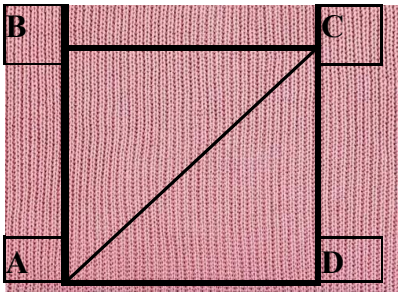

Figure – 3 Diagonal Marking Procedures

B–6.2.4 Calculation of the Spirality in Percentage

i. Calculate the percentage change in the wale angle spirality from the original measurement as follow:

$$S = \frac{\alpha - \beta}{\alpha} \times 100$$

Where;

S = is the percentage spirality change after laundering, expressed as a percentage of the original;
α = is the original wale spirality angle, expressed in degrees [See Figure 4(a)];
β = is the wale spirality after laundering, expressed in degrees [See Figure 4(b)].

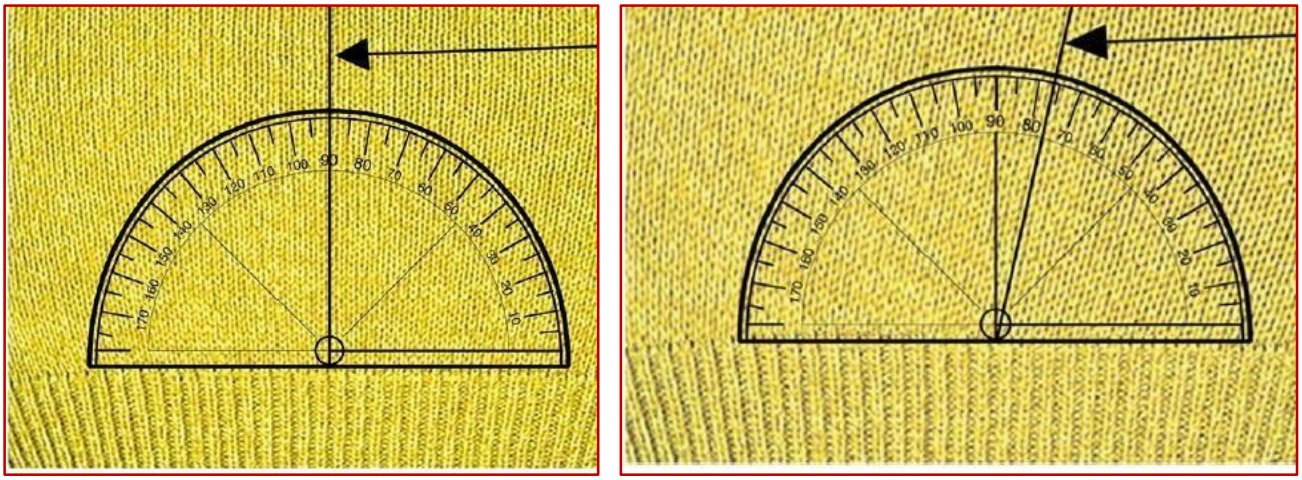

Figure 4: (a) Originally measured spirality angle α, (b) Measured spirality angle β after laundering.

ANNEX C

IDENTIFICATION OF FIBRES

C-1 IDENTIFICATION OF COTTON

C–1.1 The material used for manufacture is dipped in any one of the following reagents:

a) Cotton dissolves in Schweitzer's Reagent ($Cu(OH)_2$ in ammonia), a specific test for cellulose.
b) Cotton will dissolve in concentrated sulfuric acid, indicating the presence of cellulose.
c) Boil the fabric sample in a 5% NaOH solution. Cotton will degrade and lose its structure in strong NaOH solutions.

C-2.2 If the material used for manufacture is cotton; it shall dissolve in the above mentioned reagents.

C-2 IDENTIFICATION OF POLYESTER

C–2.1 The material used for manufacture is dipped in the following reagents:

a) Solution of crystallized tri-chloro-acetic acid/chloroform reagent, prepared at a mass ratio 1:1.
b) Benzyl Alcohol at temperatures of 150°C.
c) M-cresol at 93 ºC, Polyester will dissolve

C-2.2 If the material used for manufacture is polyester; it shall dissolve in the above mentioned reagents.

C–3 IDENTIFIOCATION OF VISCOSE RAYON

C-3.1 The material used for manufacture is viscose rayon, it shall either dissolve or swell in the above mentioned reagents.

a) **Procedure:** Immerse a small sample in a solution of sodium hydroxide (NaOH). Viscose rayon will swell and may dissolve, while cellulose fibers like cotton will remain largely unchanged.
b) **Procedure:** Soak the fiber in concentrated acetic acid for a few minutes. Viscose rayon will dissolve in acetic acid, while most other fibers will not.

C–4 IDENTIFIOCATION OF NYLON 6

C-4.1 The material used for manufacture is dipped in the following reagents:

a) Formic Acid at temperatures of 70°C.
b) m-Cresol at temperatures of 80°C.

C-4.2 If the material used for manufacture is Nylon 6; it shall dissolve in the above mentioned reagents.

C–5 IDENTIFICATION OF BAMBOO AND MODAL FIBRES

C-5.1 The material used for manufacture is dipped in the following reagents:

a) **Procedure:** Immerse a small sample in a solution of 1% sodium hydroxide (NaOH) for about 30 minutes.
b) **Observation:** If the fibre dissolves, it is likely a cellulose-based fibre (bamboo or modal).

C–6 IDENTIFICATION OF TENCEL FIBRES

C- 6.1 The material used for manufacture is dipped in the following reagents:

a) **Procedure:** Tencel is more resistant to strong bases, but can dissolve in a solution of 60% zinc chloride.
b) Immerse the fiber sample in this solution for about 30 minutes.
c) **Observation:** If the fibre dissolves in this solution, it is likely Tencel.