

भारतीय मानक ब्यूरो
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भारतीय मानक मसौदा

वस्त्रादि — पॉलिएस्टर रेशे से भरे तकिए — विशिष्टि

Draft Indian Standard

TEXTILES — POLYESTER FIBRE FILLED PILLOWS — SPECIFICATION

ICS: 59.060.20, 59.060.01, 97.160

Made-up Textiles (Including Ready-Made Garments)
Sectional Committee, TXD 20

Last date for receipt of comments is
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FOREWORD

(Formal clauses will be added later)

A pillow functions primarily as a means of support for the head, typically utilized during sleep, or for the body support when placed on a couch or chair. Pillow composed of filler materials such as polyester, cotton, foam, feathers, down etc. which is encased within a sealed stitched casing fabric. Pillows or cushions often have a conventional shape that is either rectangular or square.

This standard covers specifications for filling fibres and casing fabric of the pillow along with specifications for outer protective cover. Attempts have been made to synchronize the requirements of the standard with the needs of organized consumers, including railways and the hospitality industry. In preparation of this standard considerable assistance has been derived from Northern Railway's requirements for pillow specifications.

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 specifies the requirements for polyester fibre filled pillows and outer protective cover.

1.2 This standard does not specify the general appearance, feel, shade, etc, of the pillow and outer protective cover.

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 indicated in Annex A.

3 ATMOSPHERIC CONDITIONS FOR TESTING

Test specimens may be conditioned and tested in the prevailing atmosphere for determining the conformity of the pillow to this standard. However, in all cases of disputes, specimen shall be conditioned and tested in the standard atmosphere as specified in the referred Indian Standards on test methods.

4 TERMS AND DEFINITIONS

For the purpose of this standard, the following definitions shall apply:

4.1 Casing/Inner Primary Cover

A textile fabric covering that encloses the filled fibre material.

4.2 Filler

The fibres used to be uniformly packed in the casing.

4.3 Pillow

An assembly composed of filler material enclosed within a casing.

4.4 Outer Protective Cover

A sewn fabric cover that contains a pillow and is easily removable for washing purposes.

4.5 Piping

A cord sewn on all four sides of the casing pillow as a decorative trim and also helps the pillow to maintain its desired shape.

5 MANUFACTURES

5.1 A pillow shall consist of a casing made of either one piece of fabric or two equally sized pieces of fabric to encase a synthetic-fibre filler material. The casing fabric shall be stitched on two sides for the one piece of fabric and on three sides for two pieces of fabric.

5.2 The filler material used shall be virgin siliconized hollow conjugate polyester fibre. The filler polyester fibre used for filling shall be a carded web opened on a roller-type card or blow-filled into the casing after opening on suitable opening machines. After filling, the open side of the casing shall be stitched in the same manner as for the other sides of the casing. All the sides may be secured with piping as agreed to between the buyer and the seller.

5.3 The outer protective cover shall be laminated from the inside using TPU film with a minimum thickness of 20 microns. The lamination shall be applied uniformly to the base fabric. The dimensions of the outer protective cover shall be as agreed to between the buyer and the seller. The base fabric of outer protective cover shall be of polyester fibre and nominal GSM of base fabric shall be 90 g/m².

6 WORKMANSHIP AND FINISH

6.1 The pillow and the outer protective cover shall be made of uniform shape, finish, and workmanship throughout;

1. Free from defects that could affect their appearance and/or their serviceability;
2. Made such that all seams are smooth and sewing is free from pleats and puckers, sufficiently extensible to prevent seam-cracking;
3. Made such that all ends of sewing have been trimmed and loose threads removed;
4. Capable of being cleaned in accordance with the care instructions without giving rise to any defect, such as puckering, lumpiness, tears etc.; and
5. Delivered in a clean and commercially dry condition.

7 REQUIREMENTS

7.1 Casing

The casing shall conform to the general and performance requirements as specified in Table 1 and Table 2.

Table 1 Casing Fabric General Requirements
(Clause 7.1)

Sl No.	Type	Fiber Type	Nominal Count of yarn		Ends/cm	Picks/cm	Mass g/m ² , <i>Min</i> (see Note 2)
			Warp	weft			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
i)	1	100% micro polyester	80 D	150 D	49	27	95

ii)	2	100% polyester	80 D	40s	51	26	90
iii)	3	100% cotton	40s	40s	55	34	135
iv)	4	65% polyester and 35% cotton	40s	40s	55	34	135
v)	Tolerance	± 3 %	± 5 %	± 5 %	± 4	± 3	
vi)	Method of Test, Ref to	IS 667 and IS 3416	IS 3442 and IS 7703 (part 1)	IS 3442 and IS 7703 (part 1)	IS 1963	IS 1963	IS 1964

Table 2 Casing fabric performance requirement
(Clause 7.1)

Sl No.	Characteristics	Requirements				Method of Test, Ref to
		Type 1	Type 2	Type 3	Type 4	
(1)	(2)	(3)	(4)	(5)	(6)	(7)
i)	Breaking Load, kgf, <i>Min</i> a) Warp b) Weft	40 40	35 25	15 15	20 15	IS 1969 (Part 1)
ii)	Tear Strength, kgf, <i>Min</i> a) Warp b) Weft	1.8 1.8	1.8 1.0	0.8 0.8	0.8 0.8	IS 6489 (Part 1)
iii)	Dimensional Change (after 3 washes), <i>percent</i> a) Warp b) Weft	+ 3 to -3	+ 3 to -3	+ 3 to -5	+ 3 to -5	IS 15370/ISO 6330
iv)	pH value of aqueous extract	6.0 - 8.0	6.0 - 8.0	6.0 - 8.0	6.0 - 8.0	IS 1390
v)	Colour fastness to: (only for dyed fabric)					
vi)	a) Light			4 or better		IS/ISO 105-B02
vii)	b) Washing 1) Colour change 2) Staining			4 or better		IS/ISO 105-C06
viii)	c) Rubbing 1) Dry 2) Wet			4 or better		IS/ISO 105-C06
ix)	d) Perspiration (acidic and alkaline) 1) Color change 2) Staining			4 or better		IS/ISO 105-E04
x)	Seam strength, N, <i>Min</i>	60	60	60	60	IS/ISO 13935-1

xi)	Pilling resistance (1000 revolution)	3 or better	3 or better	3 or better	3 or better	IS 10971 (Part 2)
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7.2 The outer protective cover shall conform to the requirements as specified in Table 3.

Table 3 Outer Protective cover requirements
(Clause 7.2)

SI No.	Characteristic	Requirement	Method of Test, Ref to
(1)	(2)	(3)	(4)
i)	Areal Density (base fabric + lamination), Min, g/m ²	135	IS 1964
ii)	Hydrostatic pressure head test, Rate 60cm/min, Min	300 cm H ₂ O	IS 391
iii)	Pilling resistance (1000 revolution)	4 or better	IS 10971 (Part 2)
iv)	pH of aqueous extract	6.0 - 8.0	IS 1390
v)	Coating adhesion strength, Min, 50mm	0.8 kgf	IS 7016 (Part 5)
vi)	Colour fastness to saliva and Perspiration (for dyed fabric only)	Resistant to saliva and perspiration	IS 15626
vii)	Dimensional Change (after 3 washes), <i>percent</i> a)Warp b)Weft	+ 3 to -3	IS 15370/ISO 6330
viii)	General appearance after washing	No seam opening or broken stitches, no delamination and breakage of TPU layer	Visual

7.3 Filler

The filling fibre shall be siliconized virgin hollow conjugate polyester fibre. The nominal fibre denier of filler fibre may be either 15, 7, 5, 4, or 3 as specified in Table 4. The filler fibre shall be identified by the methods specified in IS 667 and for the hollowness determination as prescribed in Annex C.

NOTE — The pillow manufacturer may obtain a certificate from the fibre manufacturer along with a test report indicating that the fill fibre is siliconized hollow conjugate polyester fibre for every lot of fibre purchased.

Table 4 Requirements of Hollow Conjugate Siliconised Polyester Fill Fibre
(Clause 7.3)

Sl No.	Properties	Specifications & Limits					Method of Test, Ref to
		3 Denier	4 Denier	5 Denier	7 Denier	15 Denier	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
i)	Fibre linear density (Denier)	3 ± 0.5	4.0 ± 0.5	5.0 ± 0.50	7.0 ± 1.0	15.0 ± 1.0	IS 10014 (Part 2)
ii)	Nominal Hollowness (%)	12 – 18		14 – 20			Annex C

7.4 Dimensions and Fill Mass of Pillow

Unless otherwise specified, the nominal dimensions of the pillow casing and the mass of the filled fibres shall be as specified in Table 5. The actual dimensions of the pillow casing when tested by method prescribed in Annex B shall not be less than nominal dimensions. The mass of filled fibres shall be calculated by opening the seam and weighing the entire filled fibres on an electronic balance to an accuracy of 0.1 g.

Table 5 Unfilled Casing Dimensions and Mass of Fill Fibres
(Clause 7.4)

Sl No.	Pillow Size	Nominal Dimensions, cm		Nominal mass of Fill Fibers in g	
		Length	Width	3 – 7 D	≥ 15 D
(1)	(2)	(3)	(4)	(5)	(6)
i)	1	60	40	500	450
ii)	2	55	40	450	400
iii)	3	66	51	670	620
iv)	4	76	51	760	710
v)	5	92	51	930	870
vi)	Tolerance	+ 2 cm - 0 cm	+ 1 cm - 0 cm	+ 5 % - 2 %	+ 5 % - 2 %
vii)	Method of Test, Ref to	Annex B			

NOTE — The others dimensions and filled mass shall be as agreed to between buyer and seller. The tolerance specified in table 5 shall be applicable on the declared dimensions and mass of fill fibres.

7.4.1 The compressive set of the pillow when tested as per Annex D shall be maximum 10 percent.

7.5 Requirements for Hemming

7.5.1 An opening across the complete width of the outer pillow protective cover shall be provided to facilitate the insertion of the pillow. The location of the opening and overlap shall be

as agreed to between the buyer and the seller. Unless otherwise specified, minimum length of flap shall be 140 mm.

7.5.2 To prevent the unraveling of the threads across the opening side, raw edges shall be turned in to provide a hem of minimum 1 cm.

7.5.3 *Sewing thread*

Unless otherwise specified, a nominal 30 tex polyester 3 ply sewing thread with a minimum tensile strength of 10 N shall be used for both the casing and pillow protective cover. In the case of dyed fabric, the thread shall be of a similar shade.

7.5.4 *Sewing and stitches*

The sewing shall be of even tension and the loose ends shall be finished securely and neatly. The number of stitches shall not be less than 4 per cm for casing and pillow protective cover, when tested by a needle and counting glass.

7.5.5 *Piping (Optional)*

100 percent polyester or polyester/cotton (65:35 percent) or 100 percent cotton cord may be used as piping on all four sides of the pillow/cushion.

8 SEALED SAMPLE

8.1 If, in order to illustrate indeterminable characteristics such as general appearance, lustre, feel and shade, a sample has been agreed upon and sealed, the supply shall be in conformity with the sample in such respects.

8.1.1 The custody of the sealed sample shall be a matter of prior agreement between the buyer and the seller.

9 MARKING

9.1 The casing shall be suitably marked on a suitable printed cloth label in legible and indelible marking, which shall be securely attached to an edge of, or on top (near one of the corners) of each pillow:

- a) Type of fill fibre;
- b) Dimensions of the pillow;
- c) Mass of filled fibre;
- d) Type of casing fabric (blend composition);
- e) Manufacturer's name, initials, or trademark;
- f) Indication of the source of manufacture; and
- g) Any other information as required by the law in force.

9.1.1 The outer protective cover shall be suitably marked with the following information:

- a) Blend composition of outer protective cover;

- b) Manufacturer's name, initials, or trademark;
- c) Indication of the source of manufacture; and
- d) Any other information as required by the law in force.

Another suitable cloth label indicating symbols for proper care of pillow during washing, dry-cleaning, drying and ironing shall also be attached with each piece of pillow casing and outer protector as per IS 14452 at a conspicuous place, for example, at corner.

9.2 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 there under, and the products may be marked with the Standard Mark.

10 PACKING

Unless otherwise agreed upon by the buyer and the seller the pillow shall preferably be packed individually in a LLDPE, LDPE bag of thickness not less than 40 microns. A suitable number of such pillows shall then be packed in a suitable bulk container. Pillows of the same nominal dimension and that contain the same type of filling shall be packed together in a bulk container.

11 SAMPLING

11.1 Lot

The number of pieces of the pillow of the same size, filling fibre and same quality of casing fabric delivered to a buyer against one dispatch note shall constitute a lot.

11.2 The conformity of the lot to the various requirements specified in the standard shall be determined on the basis of tests carried out on the sample selected from the lot.

11.3 Unless otherwise agreed, the number of pieces selected at random for inspection shall be in accordance with Table 6.

11.3.1 For selection of samples at random from the lot, procedure given in IS 4905 may be followed.

11.4 Number of Samples and Criteria for Conformity

It shall be as follows:

Table 6 Sample Size

(Clauses 11.3, 11.4.1 and 11.4.2)

SI No.	Lot Size	Sample Size	Sub-sample Size	Permissible Number of Non-conforming Pieces
(1)	(2)	(3)	(4)	(5)
i)	Up to 50	5	3	0
ii)	50 to 150	8	5	0
iii)	151 to 280	13	8	0
iv)	281 to 500	20	8	0
v)	501 to 1 200	32	13	0
vi)	1 201 to 3 200	50	13	0
vii)	3 201 to above	80	20	1

11.4.1 The number of pieces to be selected for ends/dm, picks/dm, freedom from defect, number of stitches, visual colour of fabric and sewing threads shall be in accordance with col (3) of Table 6.

For all other tests such as Blend composition, Breaking load, tear strength, colour fastness, mass per square meter of fabric, pH value, fiber fineness, pilling resistance, dimensional stability, count and strength of sewing thread, thickness of the lamination, seam strength, filling mass of fibre, the number of pieces selected shall be as given in col (4) of Table 6.

11.4.2 The lot shall be considered as conforming to the requirements of this standard if all the samples tested in accordance with col (3) of Table 6 found conforming and also the total number of defective pieces is less than or equal to the acceptance number given in col (5) of Table 6 for sub sample size.

ANNEX A
(Clause 2)

LIST OF REFERRED STANDARDS

<i>IS No.</i>	<i>Title</i>
IS 391 : 2020	Textile fabrics — Determination of resistance to water penetration — Hydrostatic pressure test (<i>second revision</i>)
IS 667 : 1981	Methods for identification of textile fibres (<i>first revision</i>)
IS 1390 : 2022	Textiles Determination of pH of aqueous extract (<i>third revision</i>)
IS 1963 : 1981	Methods for determination of threads per unit length in woven fabrics (<i>second revision</i>)
IS 1964 : 2001	Textiles — Methods for determination of mass per unit length and mass per unit area of fabrics (<i>second revision</i>)
IS 1969 (Part 1) : 2018	Textiles — Tensile properties of fabrics — Part 1 Determination of maximum force and elongation at maximum force using the strip method (<i>fourth revision</i>)
IS 3416 : 2024	Textiles — Quantitative Chemical Analysis — Mixtures of Certain Cellulose Fibres with Certain Other Fibres (Method Using Sulphuric Acid) (<i>third revision</i>)
IS 3442 : 2023	Textiles method for determination of crimp and linear density of yarn removed from fabric
IS 4905 : 2015	Random sampling and randomization procedures (<i>first revision</i>)
IS 6489 (Part 1) : 2011	Textiles — Tear properties of fabrics Part 1 Determination of tear force using ballistic pendulum method (Elmendorf) (<i>second revision</i>)
IS 7016 (Part 5) : 2019	Methods of test for coated and treated fabrics: Part 5 rubber — Or plastics — Coated fabrics — Determination of coating adhesion (<i>third revision</i>)
IS 7703 (part 1) : 1990	Methods of test for man-made fibres continuous filament flat yarn — Part 1 Linear density (<i>first revision</i>)
IS 10014 (Part 2) : 1981	Methods of tests for man-made staple fibres Part 2 Determination of linear density
IS 10971 (Part 2) : 2022	Textiles — Determination of fabric propensity to surface pilling fuzzing or matting Part 2: Modified martindale method (<i>second revision</i>)
IS/ISO 13935-1 : 2014	Textiles — Seam tensile properties of fabrics and made-up textile articles Part 1 Determination of maximum force to seam rupture using the strip method (<i>first revision</i>)
IS 14452 : 2023	Textiles — Care Labelling Code Using Symbols
IS 15370 : 2023	Textiles — Domestic Washing and Drying Procedures for Textile Testing (<i>second revision</i>)
IS 15626 : 2006	Textiles — Method for determination of colour fastness of textiles to saliva and perspiration
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-C06 : 2010	Textiles — Tests for colour fastness Part C06 Colour fastness to domestic and commercial laundering (<i>first revision</i>)
IS/ISO 105-E04 : 2013	Textiles — Tests for colour fastness — Part E04 : Colour fastness to perspiration

ANNEX B
(Clause 7.4 and Table 5)

**METHODS OF TEST FOR UNFILLED CASING DIMENSIONS AND MASS OF
FILL FIBRES IN THE PILLOW/CUSHION**

B-1 UNFILLED CASING DIMENSIONS

B-1.1 Open the pillow/cushion and take out the fill fibres from it completely. Lay the pillow/cushion casing flat on a plain surface. Gently smoothen the casing with the hands until it is free from all storage folds, creases and wrinkles.

B-1.2 Use an accurately graduated steel tape of length greater than the length of the pillow/cushion casing to determine, to the nearest cm, at approximately three equal intervals in each direction, the width and the length of the pillow/cushion.

B-1.3 Calculate the arithmetic mean of each set of measurements and record the results as the width and the length, respectively, of the pillow.

B-2 MASS OF FILL FIBRE IN THE PILLOW/CUSHION

B-2.1 Weigh all the fill fibre mass obtained in **B-1.1** in an electronic balance capable of measuring to the nearest mg.

B-2.2 Repeat similarly for all other samples selected as per Table 6 and calculate the arithmetic mean of all measurements

ANNEX C
(Clause 7.3 and Table 4)

METHODS OF TEST FOR FILL FIBRE PROPERTIES

C-1 TEST FOR HOLLOWNESS

C-1.1 Definition

C-1.1.1 Hollowness

Ratio of the area of the inner hole of the hollow fibre to the total cross - sectional area of the fibre.

C-1.2 Apparatus

C-1.2.1 Microscope (with software program for cross sectional area measurement)

C-1.3 Procedure

C-1.3.1 Prepare a microscopic cross-section slide of a bunch of fibre.

C-1.3.2 Put the slide under microscope and focus the specimen with proper magnification.

C-1.3.3 Select a single fibre cross section and select the inner hole area.

C-1.3.4 Run the special software program for determining the area.

C-1.3.5 Similarly select the total area and determine its value.

C-1.3.6 Calculate the percentage ratio of hollow fibre area to the total fibre area to find the hollowness percentage.

C-1.3.7 Calculate percentage hollowness for 20 such fibres at random and then calculate their average value and report this value as hollowness percentage.

ANNEX D
(Clause 7.4.1)

METHOD FOR DETERMINATION OF COMPRESSION SET

D-1 TEST SPECIMEN

The test piece shall consist of the entire pillow sample, excluding the outside protective cover.

D-2 APPARATUS

The compression testing apparatus shall be capable of applying a constant load and have a load measuring device of suitable capacity for measuring the load required to be applied. The essential parts of the testing apparatus are an adjustable/moveable top jaw with flat plate surface that can be moved vertically up or down and a fixed smooth flat plate surface, between the parallel faces of the top and bottom flat plates, the test piece is compressed.

D-3 PROCEDURE

3.1 Raise the upper plate to a height greater than the thickness of the specimen (pillow). Place the pillow sample horizontally on the lower platform/plate, so the test sample is placed between the parallel plates. The dimensions of the plates shall be larger than the test piece. Sufficient care shall be taken to avoid displacement of the test piece.

3.2 To determine the initial thickness of the test sample, gradually lower the upper plate and apply 100 grams force load on the specimen to measure the initial thickness. i.e T_0 . The readings will be displayed on the monitor of the UTM or the thickness can be measured manually by a calibrated steel scale (capable of measuring dimensions up to 30 cm with an accuracy of 1 mm) as the distance between the top and bottom plates at 100 gram force load.

3.3 After recording the initial thickness of the sample (T_0) gradually lower the upper plate until the loading on the sample reaches 5 kgf, as determined by a suitable load measuring sensor. When the load reaches 5 kgf, maintain a steady load of 5 kgf on the test sample for a duration of 8 hours.

3.4 After 8 h of applying a compressive force of 5 kgf, release the load from the test piece by lifting the top plate above the height of the test specimen, ensuring that it does not make contact with the pillow surface. Allow the test sample to recover for 30 minutes at ambient temperature. After a 30 minutes recovery period, measure the final thickness after recovery of the test sample by lowering the top plate and applying 100 grams force load on the sample and measure the

distance between top plate and lower plate same as 3.2. Test at least two test pieces and take the average of the test results.

D-4 CALCULATION

Calculate the compression set using the following formula:

$$C_s = (T_o - T_r) / T_o \times 100$$

where

C_s = compression set expressed as percentage;

T_o = initial thickness of the test piece; and

T_r = final thickness after recovery of the test piece.