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SPECIFICATION FOR
COTTON CELLULAR SHIRTING
(Second Revision)

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Price Group 3

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Indian Standard
SPECIFICATION FOR
COTTON CELLULAR SHIRTING
(Second Revision)

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Indian Standard
SPECIFICATION FOR
COTTON CELLULAR SHIRTING
(*Second Revision*)

0. FOREWORD

0.1 This Indian Standard (Second Revision) was adopted by the Indian Standards Institution on 15 May 1980, after the draft finalized by the Cotton and Cotton Products Sectional Committee, had been approved by the Textile Division Council.

0.2 This standard was originally published in 1957 and first revised in 1973. The second revision has been taken up to modify the colour fastness rating to light, scouring loss, pH value and tolerances on ends, picks and mass. The requirement of colour fastness to bleaching has been deleted while to that of perspiration has been included.

0.3 To familiarize the industry with International System of Units (SI Units), SI Units recommended for use in the textile industry are given in Appendix A.

0.3.1 Standards of Weights and Measures Act 1976 also stipulates use of SI Units.

0.4 This edition 3.1 incorporates Amendment No. 1 (April 1990). Side bar indicates modification of the text as the result of incorporation of the amendment.

0.5 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, shall be rounded off in accordance with IS : 2-1960*. 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 requirements of one variety of cotton cellular shirting, bleached or

*Rules for rounding off numerical values (*revised*).

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dyed. If agreed man-made fibres may be blended with cotton, but their percentage shall not exceed 40.

1.2 This standard does not specify the general appearance, feel, shade, etc, of the cloth (see also **3.3**).

2. MANUFACTURE

2.1 Yarn — The cotton yarn used in the manufacture of the cloth shall be satisfactory in evenness and reasonably free from neps and other spinning defects.

2.2 Cloth — The cloth shall be free from dressing and filling materials and substances liable to cause subsequent tendering.

2.2.1 The cloth shall be dyed with suitable dyes to shades as agreed to between the buyer and the seller.

NOTE — If required by the buyer, the cloth of khaki and greenish khaki shades shall be dyed with iron and chromium salts (mineral khaki) in suitable proportions to achieve the required shade and for olive green shade the cloth shall be dyed with vat dyes in conjunction with iron and chromium salts.

2.2.2 The bleached cloth shall have a full bleached finish.

NOTE — The cloth shall be free from blueing or optical whitening agents, if required by the buyer.

2.2.3 The cloth when visually examined shall be reasonably free from spinning, weaving and processing defects.

3. REQUIREMENTS

3.1 The constructional particulars of the shirting shall conform to those given in Table 1 excepting the count of warp and weft yarns which have been given for guidance only.

3.2 The colour fastness ratings and other requirements of the shirting shall conform to those given in Table 2.

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

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

TABLE 1 CONSTRUCTIONAL PARTICULARS OF COTTON CELLULAR SHIRTING
(Clause 3.1)

APPROXIMATE COUNT OF YARN COTTON COUNT (Tex)		ENDS/ cm	PICKS/ cm	MASS	BREAKING LOAD ON 5.0 × 20 cm STRIPS (RAVELLED STRIP METHOD), <i>Min</i> (see Note)		LENGTH	WIDTH	WEAVE
Warp	Wett				warp	wett			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
				g/m ²	N (kgf)	N (kgf)	m	cm	
20s (30 tex)	14s (42 tex)	28	18	170 (dyed with mineral khaki base) 155 (bleached and dyed with other than mineral khaki base)	510 (52)	400 (41)	36 or above as agreed	84 or as agreed	4-end cellular
TOLERANCE, PERCENT	—	—	±5	±5	+5 -2.5	—	—	±2	—
METHOD OF TEST	—	—	IS : 1963 - 1969*	IS : 1964 - 1970†	IS : 1969 - 1968‡	IS : 1954 - 1969§	—	—	Visual

NOTE — In case of bleached fabrics and dyed fabrics (other than mineral khaki base), the breaking load values may be less by 10 percent than the specified values.

*Methods for determination of threads per decimetre in woven fabrics (*first revision*).

†Methods for determination of weight per square metre and weight per linear metre of fabrics (*first revision*).

‡Method for determination of breaking load and elongation at break of woven textile fabrics (*first revision*).

§Methods for determination of length and width of fabrics (*first revision*).

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TABLE 2 REQUIREMENTS OF COTTON CELLULAR SHIRTING

(Clause 3.2)

SL No.	CHARACTERISTICS	REQUIREMENT	METHOD OF TEST
(1)	(2)	(3)	(4)
i)	Colour fastness to:		
a)	Light		IS : 2454 - 1967*
	Olivegreen & khaki shades	5 or better	
	Other shades	4 or better	
b)	Washing: Test 5 (see Note)	4 or better	IS : 3417 1966†
c)	Perspiration	4 or better	IS : 971-19561‡
ii)	Scouring loss, percent, <i>Max</i>	3.0	IS : 1383 1977§ (Mild Method) IS : 1390-1961
iii)	pH value:		
	Olive green & khaki shades	6.0 to 10.0	
	Other shades	6.0 to 8.5	
iv)	Shrinkage or elongation, percent <i>Max</i>		IS : 2977- 196¶
a)	Bleached or dyed	4.0	
b)	Bleached/dyed and preshrunk	3.0	
v)	Blend composition (for blended fabrics)	As agreed ± 3 percent	Relevant Indian Standards

NOTE — In case of shirting dyed to olive green shade, it shall be subjected to wash fastness according to IS : 3417-1966† repeated four times.

*Method for determination of colour fastness of textile materials to artificial light (xenon lamp).

†Method for determination of colour fastness of textile materials to washing: Test 5.

‡Method for determination of colour fastness of textile materials to perspiration.

§Method for determination of scouring loss in grey and finished cotton textile materials (*first revision*).

Method for determination of pH value of aqueous extracts of textile materials.

¶Method for determination of dimensional changes of woven fabrics (other than wool) on soaking in water.

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4. MARKING

4.1 The cloth shall be marked with the following:

- a) Name of the material;
- b) Fibre composition in the descending order, in case of blended fabrics;
- c) Length and width of the piece;
- d) Manufacturers' name, initials or trade-mark, if any; and
- e) Year of manufacture.

4.1.1 BIS Certification Marking

4.1.2 The product may also be marked with Standard Mark.

4.1.3 The use of the Standard Mark is governed by the provisions of Bureau of Indian Standards Act, 1986 and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

4.2 At the other end of the piece, the cloth shall be marked with an identification mark.

5. PACKING

5.1 The cloth shall be packed in bales or cases in conformity with the procedure laid down in IS : 1347-1972* or in IS : 293 - 1980† as required.

6. SAMPLING

6.1 The scale of sampling and criteria for conformity as given in IS : 3919-1966‡ shall be followed in respect of physical characteristics, namely, ends and picks, mass, breaking load, length and width of cloth.

6.2 The scale of sampling and criteria for conformity as given in IS : 5463-1969§ shall be allowed in respect of the chemical characteristics, namely, colour fastness, scouring loss, pH value, shrinkage or elongation, and blend composition (in case of blended fabric).

*Specification for inland packaging of cotton cloth and yarn (*first revision*).

†Specification for seaworthy packaging of cotton cloth and yarn (*third revision*).

‡Methods for sampling cotton fabrics for determination of physical characteristics.

§Methods for sampling of cotton fabrics for chemical tests.

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APPENDIX A

(Clause 0.3)

RECOMMENDED SI UNITS FOR TEXTILES

SL No.	CHARACTERISTIC	SI UNITS		APPLICATION
		Unit	Abbreviation	
(1)	(2)	(3)	(4)	(5)
1)	Length	Millimetre Millimetre, centimetre	mm mm, cm	Fibre Samples and test specimens (as appropriate)
		Metre	m	Yarns, ropes and cordages, fabrics
2)	Width	Millimetre Centimetre Millimetre, centimetre	mm cm mm, cm	Narrow fabrics Other fabrics Samples, and test specimens (as appropriate)
		Centimetre, metre	cm, m	Carpets, druggets, durries (as appropriate)
3)	Thickness	Micrometre (micron) Millimetre	μ m mm	Delicate fabrics Other fabrics, carpets, felts
4)	Linear density	Tex Millitex Decitex	tex mtx dtex	Yarns Fibres Filament and filament yarns
		Kilotex	ktex	Slivers, ropes and cordages
5)	Diameter	Micrometre (micron) Millimetre	μ m mm	Fibres Yarns, ropes, cordages
6)	Circumference	Millimetre	mm	Ropes, cordages
7)	Threads in fabric:			Woven fabrics (as appropriate)
	a) Lengthwise	Number per centimetre Number per decimetre	ends/cm ends/dm	
	b) Widthwise	Number per centimetre Number per decimetre	picks/cm picks/dm	

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RECOMMENDED SI UNITS FOR TEXTILES — Contd

SL No.	CHARACTERISTIC	SI UNITS		APPLICATION
		Unit	Abbreviation	
(1)	(2)	(3)	(4)	(5)
8)	Warp threads in loom	Number per centimetre	ends/cm	Reeds
9)	Stitches in knitted fabric:			Knitted fabrics (as appropriate)
	Lengthwise	Courses per centimetre Courses per decimetre	courses/cm courses/dm	
	Widthwise	Wales per centimetre Wales per decimetre	wales/cm wales/dm	
10)	Stitch length	Millimetre	mm	Knitted fabrics, Made-up fabrics
11)	Mass per unit area	Grams per square metre	g/m ²	Fabrics
12)	Mass per unit length	Grams per metre	g/m	Fabrics
13)	Twist	Turns per centimetre Turns per metre	turns/cm turns/m	Yarns, ropes (as appropriate)
14)	Test or gauge length	Millimetre, centimetre	mm, cm	
15)	Breaking load	Millinewton	mN	Fibres, delicate yarns (skeins or individual)
		Newton	N	Strong yarns (individual or skeins), ropes, and cordages, fabrics
16)	Breaking length	Kilometre	km	Yarns
17)	Tenacity	Millinewton per tex	mN/tex	Fibres, yarns (individual or skeins)
18)	Twist factor or twist multiplier	Turns per centimetre × square root of tex	turns/cm × $\sqrt{\text{tex}}$	Yarns (as appropriate)
		Turns per metre × square root of tex	turns/m × $\sqrt{\text{tex}}$	

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RECOMMENDED SI UNITS FOR TEXTILES — *Contd*

SL No.	CHARACTERISTIC	SI UNITS		APPLICATION
		Unit	Abbreviation	
(1)	(2)	(3)	(4)	(5)
19)	Bursting strength	Newton per square centimetre	N/cm ²	Fabrics
20)	Tear strength	Millinewton	mN	Fabrics (as appropriate)
		Newton	N	
21)	Pile height	Millimetre	mm	Carpets
22)	Pile density	Mass of pile yarn in grams per square metre per millimetre pile height	g/m ² /mm pile height	Pile carpet
23)	Elastic modulus	Millinewton per tex per unit deformation	mN/tex/unit deformation	Fibres, yarns, strands

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