40

IS : 3255 - 1979
(Reaffirmed ~~1996~~ 2003)
Edition 2.1
(1998-12)

Indian Standard

SPECIFICATION FOR SCOURED OR DYED COTTON TAPES FOR AEROSPACE PURPOSES

(First Revision)

(Incorporating Amendment No. 1)

UDC 677.754 : 677.21 : 629.136.1

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

Price Group 3

Km. S. Jyothi
Pl. kept in folder
2/6/06

2/6/06
JWM/T

Purchased through C.P.No. 20060144 dt 25-5-06.

Indian Standard

SPECIFICATION FOR SCOURED OR DYED COTTON TAPES FOR AEROSPACE PURPOSES

(First Revision)

Textile Materials for Aerospace Purposes Sectional Committee, TDC 27

Chairman	*Representing*
SHRI K. B. GANESAN	Directorate General of Civil Aviation, New Delhi
Members	
SHRI P. R. CHANDRASEKHAR (*Alternate* to Shri K. B. Ganesan)	
SHRI M. K. BARDHAN	Ministry of Defence [DGI (CIT & C)]
SHRI K. K. KAPOOR (*Alternate*)	
SHRI M. S. EKBOTE	Indian Airlines, New Delhi
SHRI I. HUSSAIN	Ministry of Defence [R & D (ADRDE)]
SHRI S. K. GANGULI (*Alternate*)	
SHRI S. K. IYENGAR	J. K. Synthetics Ltd, Bombay
SHRI C. SIVARAMAN (*Alternate*)	
SHRI M. L. JAIN	Jaya Shree Textiles & Industries Ltd, Rishra
SHRI G. L. MOONDRA (*Alternate*)	
SHRI P. K. KURIAN	Hindustan Aeronautics Ltd, Bangalore
SHRI M. G. K. MURTHY	Ministry of Defence [DTD & P (Air)]
SHRI V. CHANDRASEKARAN (*Alternate*)	
SHRI GAUTAMBHAI NANAVATY	Unnati Corporation, Ahmadabad
SHRI S. G. RATNAM	Madura Coats Ltd (Thread Group), Koratti
SHRI K. S. RAO (*Alternate*)	
REPRESENTATIVE	Ahmedabad Textile Industry's Research Association, Ahmadabad
SHRI G. H. RODRICKS	Fibreglass Pilkington Ltd, Bombay
SHRI G. RAVISHANKAR (*Alternate*)	
SHRI V. G. SARUKKAI	Aero Marine Industries Pvt Ltd, Madras
SHRI B. G. V. SUBRAHMANYAM	Indian Space Research Organization, Ahmadabad
SHRI M. G. THANAWALA	M. Best Cotton Rope Mfg Co, Bombay
SHRI P. G. THANAWALA (*Alternate*)	

(*Continued on page* 2)

(*Continued from page* 1)

Members	*Representing*
SHRI S. B. TODI SHRI N. B. TODI (*Alternate*)	Todi Industries Pvt Ltd, Bombay
SHRI R. VISWANATHAN	Chemicals and Fibres of India Ltd, Thane
WG CDR S. N. WADHWA	Ministry of Defence [Air Headquarters (Maintenance)]
SHRI R. B. MOHINDRA (*Alternate*)	
SHRI K. N. M. YELAHANKA	Air India, Bombay
SHRI S. M. CHAKRABORTY, Director (Tex)	Director General, BIS (*Ex-officio Member*)

Secretary

SHRI S. M. AURORA
Deputy Director (Tex), BIS

Indian Standard

SPECIFICATION FOR SCOURED OR DYED COTTON TAPES FOR AEROSPACE PURPOSES

(First Revision)

0. FOREWORD

0.1 This Indian Standard (First Revision) was adopted by the Indian Standards Institution on 15 June 1979, after the draft finalized by the Textile Materials for Aerospace Purposes Sectional Committee had been approved by the Textile Division Council.

0.2 The cotton tapes covered in this standard are used in supply dropping parachutes and for reinforcement of the canopies.

0.3 In the present revision of the standard (formulated in 1965) tapes covered in IND/ADE/0069 issued by the Ministry of Defence have also been included at the instance of Chief Inspectorate of Textiles & Clothing, Kanpur.

0.3.1 Considerable assistance has been drawn from BS 3F 49 'Specification for cotton webbing', issued by the British Standards Institution, in formulation of this standard.

0.4 To familiarize the industry with International System of Units (SI units), the basic as well as the recommended SI units for use in the textile industry are given in Appendix A.

0.4.1 Standards of Weights and Measures Act, 1976 also stipulates use of SI units.

0.5 This edition 2.1 incorporates Amendment No. 1 (December 1998). Side bar indicates modification of the text as the result of incorporation of the amendment.

0.6 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*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

---

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

1. SCOPE

1.1 This standard covers scoured and/or dyed cotton tapes of width 12.7, 19.0, 25.0, 28.5, 31.7, 38.0, 44.4, 50.0, 57.0, 63.5, 75.0, 89 and 102 mm, used mainly in supply dropping parachutes.

2. MATERIAL

2.1 Unsized 3-ply cotton yarn free from spinning defects given in IS : 171 : 1973* may be found suitable.

3. REQUIREMENTS

3.1 The tape shall meet the physical requirements given in Table 1.

TABLE 1 PHYSICAL REQUIREMENTS

Length per Roll	Width mm		Mass, *Max*		Ends in Full Width		Picks/cm	Warpway Breaking Load (20cm × Full Width), *Min* (*see* Note)	
			g/m	kg/100-m Roll, Net				kN	kgf
(1)	(2)		(3)	(4)	(5)		(6)	(7)	(8)
	12.7		8	0.8	38			0.54	55
	19.0		12	1.2	56			0.84	86
	25.0		16	1.6	74			1.22	125
	28.5		18	1.8	84			1.24	127
	31.7	± 1.5	20	2.0	94	+ 4 − 0	12 +1 −0	1.38	141
100 m unless	38.0		24	2.4	112			1.81	185
otherwise	44.4		28	2.8	130			1.96	200
specified	50.0		31	3.1	148			2.45	250
	57.0		36	3.6	168			2.50	255
	63.5		40	4.0	186			2.78	284
	75.0		47	4.7	222	+ 6 − 0		3.68	375
	89	± 2.0	55	5.5	258			3.90	398
	102		63	6.3	294			4.46	455

(*Continued*)

*Specification for grey cotton yarn (*second revision*).

TABLE 1 PHYSICAL REQUIREMENTS — *Contd*

Length per Roll	Width mm	Mass, *Max*		Ends in Full Width	Picks/cm	Warpway Breaking Load (20cm × Full Width), *Min* (*see* Note)	
		g/m	kg/100-m Roll, Net			kN	kgf
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Method of Test	IS : 1954-1969*	IS : 1964-1970†		IS : 1963-1969‡		IS : 1969-1968§	

Note — The test specimens shall be conditioned for 48 hours at 27 ± 2°C and 65 ± 2 percent RH before testing for breaking strength.

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

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

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

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

3.2 The tape shall also meet the chemical requirements given as under

NOTE — Sulphur dyes shall not be used in production of dyed tapes.

Characteristic	*Requirement*	*Method of Test*
pH value	6.0 to 8.5	IS : 1390-1961*
Colour fastness:		
Light	5 or better	IS : 686-1957† or IS : 2454-1967‡
Washing	No colour bleeding (5 or better)	IS : 764-1979§
Scouring loss, percent, *Max*	3	IS : 1383-1977‖ (Severe Method)
Water solubles, percent, *Max*	1	IS : 3456-1966¶

* Methods for determination of pH value of aqueous extracts of textile materials.

†Method for determination of colour fastness of textile materials to daylight.

‡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 3 (*second revision*).

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

¶Method for determination of water soluble matter of textile materials.

3.3 The tapes shall be uniformly woven with firm selvedges in 2 × 2 twill weave and be free from weaving defects and also from sizing and finishing materials.

3.4 In respect of the requirements not covered in this standard the tapes shall not be inferior to the sealed sample agreed to in the contract or order.

4. PACKING

4.1 Each roll shall be wrapped in kraft paper; further packing of rolls in the case or carton shall be as detailed in the contract or order.

5. MARKING

5.1 Each roll shall carry the following information:

a) Name and variety of material,

b) Length/roll (m) and mass of roll (g),

c) Width of tape (mm),

d) Month and year of manufacture in suitable code, and

e) Name of the manufacturer/trade-mark.

5.1.1 Each roll may also be marked with the Standard Mark.

NOTE — The use of the Standard Mark is governed by the provisions of the Bureau of Indian Standards Act, 1986 and the Rules and Regulations made thereunder. The Standard Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well defined system of inspection, testing and quality control which is devised and supervised by BIS and operated by the producer. Standard marked products are also continuously checked by BIS for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

5.2 Each case/carton shall be marked with the details of the consignment as provided in the contract or order in addition to marking given in 5.1.

6. SAMPLING

6.1 The sampling, inspection and testing scheme shall be as detailed in the contract or order. For selecting suitable single, double or multiple sampling plans, IS : 2500 (Part I)-1973* may be referred to.

NOTE — An Indian Standard on sampling, inspection and testing scheme for aerospace textile stores is under preparation.

*Sampling inspection tables: Part I Inspection by attributes and by count of defects (*first revision*).

APPENDIX A

(*Clause* 0.4)

SI UNITS

TABLE 2 INTERNATIONAL SYSTEM UNITS

Base Units

QUANTITY	UNIT	SYMBOL
Length	metre	m
Mass	kilogram	kg
Time	second	s
Electric current	ampere	A
Thermodynamic temperature	kelvin	K
Luminous intensity	candela	cd
Amount of substance	mole	mol

Supplementary Units

QUANTITY	UNIT	SYMBOL
Plane angle	radian	rad
Solid angle	steradian	sr

Derived Units

QUANTITY	UNIT	SYMBOL	DEFINITION
Force	newton	N	1 N = 1 kg.m/s^2
Energy	joule	J	1 J = 1 N.m
Power	watt	W	1 W = 1 J/s
Flux	weber	Wb	1 Wb = 1 V.s
Flux density	tesla	T	1 T = 1 Wb/m^2
Frequency	hertz	Hz	1 Hz = 1 c/s (s^{-1})
Electric conductance	siemens	S	1 S = 1 A/V
Electromotive force	volt	V	1 V = 1 W/A
Pressure, stress	pascal	Pa	1 Pa = 1 N/m^2

TABLE 3 RECOMMENDED SI UNITS FOR TEXTILES

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

(*Continued*)

TABLE 3 RECOMMENDED SI UNITS FOR TEXTILES — *Contd*

Sl No.	Characteristic	SI Unit		Application
		Unit	Abbreviation	
(1)	(2)	(3)	(4)	(5)
9)	Stitches in knitted fabric:			Knitted fabrics (as appropriate)
	a) Lengthwise	Courses per centimetre Courses per decimetre	courses/cm courses/dm	
	b) Widthwise	Wales per centimetre Wales per decimetre	wales/cm wales/dm	
10)	Stitch length	Millimetre	mm	Knitted fabrics, made up items
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	Fibre, yarn and fabric specimens (as appropriate)
15)	Breaking load	Millinewton	mN	Fibres, delicate yarns (individual or skeins)
		Newton	N	Strong yarns (individual or skeins), ropes, 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× $\sqrt{tex}$	Yarns (as appropriate)
		Turns per metre × square root of tex	turns/m× $\sqrt{tex}$	
19)	Bursting strength	Newton per square centimetre	N/cm^2	Fabrics

(*Continued*)

TABLE 3 RECOMMENDED SI UNITS FOR TEXTILES — *Contd*

Sl No.	Characteristic	SI Unit		Application
		Unit	Abbreviation	
(1)	(2)	(3)	(4)	(5)
20)	Tear strength	Millinewton Newton	mN N	Fabrics (as appropriate)
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 carpets
23)	Elastic modulus	Millinewton per tex per unit deformation	mN/tex/unit deformation	Fibres, yarns, strands