

Indian Standard

SPECIFICATION FOR
COTTON TAPES, UNPROOFED AND
PROOFED, FOR AMMUNITION PURPOSES

(First Revision)

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TO
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UNPROOFED AND PROOFED FOR AMMUNITION
PURPOSES**

(First Revision)

(Page 5, Table 2):

- a) *Sl No. (i) (b), col 3* — Substitute '8.5' for '7.5'.
- b) *Sl No. (ii), col 3* — Substitute '0.1' for '0.05'.

(TX 12)

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COTTON TAPES, UNPROOFED AND PROOFED,
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(Page 3, clause 2.3, Note 3) — The Note be deleted.

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Indian Standard

SPECIFICATION FOR COTTON TAPES, UNPROOFED AND PROOFED, FOR AMMUNITION PURPOSES (*First Revision*)

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SPECIFICATION FOR
COTTON TAPES, UNPROOFED AND
PROOFED, FOR AMMUNITION PURPOSES
(*First Revision*)

0. FOREWORD

0.1 This Indian Standard (First Revision) was adopted by the Indian Standards Institution on 31 January 1983, after the draft finalized by the Narrow Fabrics, Webbing and Braids Sectional Committee had been approved by the Textile Division Council.

0.2 This standard was first published in 1972 based on Joint Services Specification No. 1271 ' Tape cotton, proofed, unproofed, prepared by the Armament Standardization Subcommittee, Ministry of Defence, Government of India. The present revision has been taken up for making it up to date in the light of the experience gained over these years.

0.3 The Standards of Weights & Measures Act, 1976 stipulates use of the International System of Units in the country. In order to familiarize the industry with this system, the recommended SI units for use in the textile industry are given in Appendix A.

0.4 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.

1. SCOPE

1.1 This standard prescribes the requirements of cotton tapes, unproofed and proofed, suitable for general use as well as in contact with propellants and explosives.

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

2. MANUFACTURE

2.1 Yarn — The tape shall be manufactured from cotton yarn.

NOTE — Yarn of nominal count 21 tex \times 2(or 28s/2) for warp and 23 tex (or 26s) for weft is recommended.

2.2 Tape — The weave shall be either plain or twill. The tape shall be uniformly woven and free from weaving and finishing defects. The selvedges shall be firm and straight.

2.3 Finished Tape — The tape may be grey, scoured or bleached if required in the unproofed state and shall be grey if required in the proofed state.

NOTE 1 — The amount of material added in the proofing process should not exceed 20 percent of the air-dry mass of the tape prior to proofing.

NOTE 2 — The details of single step processes which give satisfactory results in proofing are given below for guidance:

- a) *Mould Proofing*— The tape is dipped in a 0.25 percent solution of *para*-nitrophenol or 0.5 percent sodium pentachlorophenate solution for 15 minutes, excess solution drained and the tape dried in air.
- b) *Smoulder Proofing* — Same as in (c) but without *para*-nitrophenol or sodium pentachlorophenate.
- c) *Mould and Smoulder Proofing* — The tape is passed through a sizing bath containing 3 percent gelatine, 3 percent groundnut oil, 2.5 percent diammonium hydrogen phosphate and 0.25 percent *para*-nitrophenol or 0.5 percent sodium pentachlorophenate. The nip rollers are adjusted to leave on the tape its own mass of size.

NOTE 3 — When the percentage of diammonium hydrogen phosphate present in the material is of the order of 2.5 to 3 percent, no additional mould proofing is necessary.

3. REQUIREMENTS

3.1 Construction — The tapes shall comply with the constructional details specified in Table 1.

3.2 Chemical Requirements — The tapes shall comply with the chemical requirements specified in Table 2.

3.3 Additional Chemical Requirements — The proofed tapes shall also comply with the chemical requirements specified in Table 3.

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TABLE 1 CONSTRUCTIONAL PARTICULARS OF COTTON TAPE, UNPROOFED AND PROOFED

(Clause 3.1)

SL. No.	WIDTH	TOTAL, ENDS IN FULL WIDTH, <i>Min</i>	PICKS/dm, <i>Min</i>	FINISHED MASS*	BREAKING LOAD ON FULL WIDTH × 20 cm, <i>Min</i>
(1)	(2)	(3)	(4)	(5)	(6)
	mm			g/100 m	N†
i)	6.0 ± 1.5	20	125	115	85
ii)	10.0 ± 1.5	30	125	160	115
iii)	13.0 ± 1.3	35	125	210	145
iv)	16.0 ± 1.5	45	125	255	180
v)	19.0 ± 1.5	50	135	300	± 5 percent
vi)	22.0 ± 1.5	65	140	385	
vii)	25.0 ± 2.5	75	140	420	295
viii)	38.0 ± 2.5	110	140	645	445
ix)	50.0 ± 2.5	145	140	850	585

Method of Test Appendix B of IS : 4727-1968‡ 5 of IS : 1963-1981§ IS : 1964-1970|| 8 to 11 of IS : 1969-1968¶

*When tapes are scoured and/or bleached, the nominal mass would be approximately 5 percent less than that specified in col 5.

†1 N = 0.102 kgf.

‡Specification for nylon webbing for aeronautical purposes.

§Methods for determination of threads per unit length in woven fabrics (*second 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*).

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TABLE 2 CHEMICAL REQUIREMENTS OF BOTH UNPROOFED AND PROOFED COTTON TAPES

(Clause 3.2)

SL No.	CHARACTERISTIC	REQUIREMENT	METHOD OF TEST
(1)	(2)	(3)	(4)
i)	<i>pH</i> Value:		
	a) <i>Min</i>	5.5	IS : 1390-1961*
	b) <i>Max</i>	7.5	(Cold method)
ii)	Water soluble chlorides (as NaCl), percent, <i>Max</i>	0.05	IS : 4202-1967†
iii)	Water soluble sulphates (as Na ₂ SO ₄), percent, <i>Max</i>	0.25	IS : 4203-1967‡
iv)	Ash content, percent, <i>Max</i> :		
	a) Unproofed tape	0.5	7 of IS : 199-1973§
	b) Proofed tape	5.0	

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

†Method for determination of chloride content of textile materials.

‡Method for determination of sulphate content in textile materials.

§Methods for estimation of moisture, total size or finish, ash and fatty matter in grey and finished cotton textile materials (*second revision*).

TABLE 3 ADDITIONAL CHEMICAL REQUIREMENTS FOR PROOFED COTTON TAPES

(Clause 3.3)

SL No.	CHARACTERISTIC	REQUIREMENT	METHOD OF TEST
(1)	(2)	(3)	(4)
i)	Mould proofed tapes, water soluble matter, percent:		IS : 3522 (Part II)-1970*
	a) When proofed with 0.25 percent <i>para</i> -nitrophenol		
	1) <i>Min</i>	0.25	
	2) <i>Max</i>	0.75	

*Methods for estimation of common preservatives used in textile industry, Part II.

(Continued)

TABLE 3 ADDITIONAL CHEMICAL REQUIREMENTS FOR PROOFED COTTON TAPES — *Contd*

SL No.	CHARACTERISTIC	REQUIREMENT	METHOD OF TEST
(1)	(2)	(3)	(4)
	b) When proofed with 0.3 percent sodium pentachlorophenate		
	1) <i>Min</i>	0.50	
	2) <i>Max</i>	1.00	
ii)	Tapes smoulder proofed with gelatine and diammonium hydrogen phosphate		
	a) Water soluble matter, percent, <i>Min</i>	5	IS : 3456-1966*
	b) Water soluble phosphates (as diammonium hydrogen phosphate), percent:		IS : 3522 (Part II). 1970†
	1) <i>Min</i>	2.5	
	2) <i>Max</i>	3.0	
	c) Smouldering time, seconds, <i>Max</i>	5	A piece of tape of diameter equal to the width of the tape is fixed centrally on a steel skewer and ignited in a Bunsen flame from which it is withdrawn on ignition. The time elapsing between the flame dyeing out and the disappearance of glow is observed. This is the time of smouldering
iii)	Tapes smoulder-proofed with gelatine and dtammonium hydrogen photphate and mould-proofed with 0.25 percent <i>para</i> -nitrophenol:		
	a) Water soluble matter, percent:		IS : 3456-1966*
	1) <i>Min</i>	5.0	
	2) <i>Max</i>	11.0	

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

†Methods for estimation of common preservatives used in textile industry, Part II.

(Continued)

TABLE 3 ADDITIONAL CHEMICAL REQUIREMENTS FOR PROOFED COTTON TAPES - Contd

SL No.	CHARACTERISTIC	REQUIREMENT	METHOD OF TEST
(1)	(2)	(3)	(4)
b)	Soluble phosphate (at diammonium hydrogen phosphate), percent:		IS : 3522 (Part II)-1970*
	1) <i>Min</i>	2.5	
	2) <i>Max</i>	3.0	
c)	Smouldering time, seconds, <i>Max</i>	5	As at [ii (c)] above
iv)	Tapes smoulder-proofed with gelatine and diammonium hydrogen phosphate and mould-proofed with 0.5 percent sodium pentachlorophenate:		
a)	Water soluble matter, percent, <i>Min</i>	6.7	IS : 3456-1966†
b)	Soluble phosphates (as diammonium hydrogen phosphate), percent:		IS : 3522 (Part II)-1970*
	1) <i>Min</i>	2.5	
	2) <i>Max</i>	3.0	
c)	Smouldering time, seconds. <i>Max</i>	5	As at [ii(c)] above

*Methods for estimation of common preservatives used in textile industry. Part II.

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

3.4 Supply of Material — The tapes shall be made into foils of 50 ± 10 m. However, tapes having width less than 13 mm may also be supplied in hank form. The number of joints in a roll/hank shall not exceed one subject to individual piece length being not less than 5 m.

4. MARKING

4.1 Each roll/hank of tape shall be marked with the following:

- a) Name of the material;
- b) Width;
- c) Length contained in the roll/hank;
- d) Whether proofed or unproofed; and
- e) Manufacturer's name, initials or trade-mark, if any.

4.1.1 The product may also be marked with Standard mark.

4.1.2 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 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.

5. PACKING

5.1 An appropriate number of roll/hanks of tapes shall be arranged in a bundle and secured with twine to form a pack. A suitable number of such packs shall be arranged and wrapped in kraft paper (*see* IS : 1397-1967*) and placed on a layer of heavy cee cloth or equivalent hessian and made into a bale.

6. SAMPLING

6.1 Unless otherwise agreed to between the buyer and the seller, the number of tests to be carried out for various characteristics shall be according to **6.1.1** to **6.1.3**. As far as possible only one test specimen may be drawn from each roll/hank for testing for a given characteristic. The rolls/hanks shall be selected at random from a lot and to ensure randomness of selection, IS : 4905-1968† may be followed.

6.1.1 The number of tests for various physical characteristics, namely, width) length, ends, picks, mass and breaking load, shall be according to 3 of IS : 3919-1966‡.

6.1.2 The number of tests for pH value, ash content and water soluble matter content, shall be according to 3 of IS : 5463-1969§.

6.1.3 The number of specimens to be tested for water soluble chlorides, sulphates and phosphates, and smouldering time shall be 3 if the lot consists of 15 or less bales and 5 otherwise.

6.2 Criteria for Conformity — For ascertaining the conformity of a lot to the physical and chemical requirements, the criteria for conformity as given in 5 of IS : 3919-1966‡ and IS : 5463-1969§ respectively shall be followed:

*Specification for kraft paper (*first revision*).

†Methods for random sampling.

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

§Methods for sampling of cotton fabrics for chemical tests.

Sl	Characteristic	SI Unit		Application
		Unit(s)	Abbreviation(s)	
(1)	(2)	(3)	(4)	(5)
6.	Circumference	Millimetre	mm	Ropes, cordage
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	
8.	Warp threads in loom	Number per centimetre	ends/cm	Reeds
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

Sl No	Characteristic	SI Unit		Application
		Unit(s)	Abbreviation(s)	
(1)	(2)	(3)	(4)	(5)
13.	Twist	Turns per centimetre	turns/cm	} Yams, ropes, cordage (as appropriate)
		Turns per metre	turns/m	
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), Strong yarns (individual or skeins), ropes, cordage, fabrics
		Newton	N	
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 \times square root of tex	turns/cm $\times \sqrt{\text{tex}}$	} Yarns (as appropriate)
		Turns per metre \times square root of tex	turns/m $\times \sqrt{\text{tex}}$	
19.	Bursting strength	Newton per square centimetre	N/cm ²	Fabrics

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<i>Sl No.</i>	<i>Characteristic</i>	<i>SI Unit</i>		<i>Application</i>
		Unit(s)	Abbreviation(s)	
(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

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