	Specn No. ADRDE/SPECN/1992/38(b)		Revision no: 02 Dated: 27.8.21
Prepared By: <i>Dev Kishan Bairwa</i> Dev Kishan Bairwa Sc 'B'	Reviewed By: <i>P K Mallik</i> P K Mallik, Sc 'E', TG(TE)	Issue: 03 Dated: 27.7.21	Page 1 of 10

Government of India
Ministry of Defence

Specification
For

Tape Nylon Various for Aeronautical Purpose


Approved by

Gaurab Malik
27/7/21

Group Director
Technology Group (Textile Engineering)




Aerial Delivery Research and Development Establishment
Ministry of Defence
Post Box No. 51
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RECORD OF AMENDMENTS


Amendment No.	Sub heading to which amendment pertains	Authority	Incorporated by Name & Rank in Block letters	Initials
1	<u>Appendix 'A', Column 4, Type I & Type II</u> For : Ends in full width: Type I : 60 Type II : 44 Read: Ends in full width, min: Type I : 60 Type II : 48	Director ADRDE	GD, TGTE	
2	<u>Appendix 'A', Column 5, Type I & Type II</u> For : Picks or plaits per dm: Type I : 140 Type II : 34 Read: Picks or plaits per dm: Type I : 280, min Type II : 34±4	Director ADRDE	GD, TGTE	
3	<u>Appendix 'A', Column 7, Type I</u> For : Linear density of weft yarn: 46.7×1 Read: Linear density of weft yarn: 23.3×1	Director ADRDE	GD, TGTE	
4	<u>Appendix 'A', Column 10, Type I</u> For : Elongation at break, min, %: 20 Read: Elongation at break, min, %: 18	Director ADRDE	GD, TGTE	

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0. FOREWORD

- 0.1 This specification is the revision of specification no. ADRDE/SPECN/1992/38(a) and has been prepared by a special committee, reviewed and approved by Group Director, Technology Group (Textile Engineering), ADRDE, Agra.
- 0.2 This specification would be used for manufacture inspection and procurement of tape nylon various undyed/dyed against Defence requirements.
- 0.3 In case of any discrepancy between this specification and any sample or pattern, this specification shall be taken as correct.
- 0.4 Enquiries regarding this specification in relation to any contractual conditions should be addressed to the Inspection Authority named in tender or contract. Other enquiries will be referred to the issuing authority, Director, ADRDE, Agra.
- 0.5 Whenever a reference to any other specification occurs in this specification, it shall be taken as a reference to the latest version of that specification.
- 0.6 Copies of this specification can be obtained from:
- i. The Director,
A.D.R. & D.E.,
P.B. No. 51, Station Road,
Agra Cantt. - 282 001
 - ii. Concerned Inspectors and Inspection Authority.
- 0.7 IS specifications quoted in this specification may be obtained directly from B.I.S., Manak Bhawan, 9, Bahadur Shah Zafar Marg, New Delhi - 110 002 or its offices located in the country.

1. SCOPE

- 1.1 This specification covers the requirement of two types of tapes as mentioned below:
Type I – Tape Nylon 25mm 4440N
Type II – Tape Tubular Nylon Braided 18mm 6870N

2. RELATED SPECIFICATIONS


- 2.1 Reference is made in this specification to:
- i. IS: 1954 Methods for determination of length and width of fabrics.
 - ii. IS: 7702 Method for determination of thickness of woven and knitted fabrics.
 - iii. IS: 1964 Determination of weight per square meter & weight per linear meter of fabrics.
 - iv. IS: 4437 Nylon breaking cords for personnel parachute.
 - v. IS: 1963 Method for determination of threads per unit length in woven fabrics.
 - vi. IS: 3442 Determination of crimp and count of yarn removed from fabric.
 - vii. IS: 1969 Methods for determination of breaking load and elongation at break of woven textile fabrics.
 - viii. IS: 4905 Method for random sampling.
- 2.2 All the specifications/drawings referred in this specification for any tender or contract, shall mean the current edition on the date of such tender or contract

3. MATERIAL

- 3.1 The basic material shall be Nylon 6 or Nylon 66. The yarn for both warp and weft shall be bright, multifilament of high tenacity

4. MANUFACTURE

- 4.1 The single or folded yarn shall be evenly twisted with a minimum of 100 turns per meter (TPM). The tape shall be woven under suitable tension. The edges shall be firm and regular

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4.2 The tapes shall not be more than one year old from the date of manufacture to the date of delivery. A certificate to this effect shall be provided by the manufacturer/contractor at the time of delivery.

5. DIMENSIONS AND FINISH

5.1 The tapes nylon shall be conform to the essential particular given in Appendix 'A'.

6. WORKMANSHIP AND FINISH

6.1 The tapes nylon shall be free from weaving/braiding defects. When laid on a flat even surface the tape shall be in straight line without of any tension.

7. MARKING

7.1 Each roll shall be suitably attached with a label. The label shall be legibly and indelibly marked with nomenclature, manufacture's name, initial or recognized trade mark, year of manufacturer, length of roll and defence catalogue number of the store, if any.

8. QUALITY

8.1 Any portion of the samples drawn from a consignment on examination shall show its conformity to the particular furnished in the table under appendix 'A' in addition to the following, when tested in accordance with the standard methods.

Tests	Requirement
pH (by cold method)	6-8.5

9. PRE-INSEPCION OF STORES/CONSIGNMNET

9.1 Manufacturers/contractors must satisfy themselves that the stores are in accordance with the terms of the contract and fully conform to the required specification by carrying out a thorough pre-inspection of each lot before actually tendering the same for inspection to the inspecting officer nominated under the terms of the contract. A declaration by the contractor that necessary pre-inspection has been carried out on the stores tendered, will be submitted along with the challan. The declaration will also indicate the method followed in carrying out pre-inspection showing the features checked/tested and will have the test certificate attached to the challan/declaration.

9.2 If the Inspecting officer finds that pre-inspection of the consignment as required above has not been carried out, the consignment is liable for rejection.

10. SAMPLING

10.1 The manufacturer/supplier shall tender stores duly numbered and arranged in such a way that all the units are easily accessible to the Inspector.


10.2 For carrying out full laboratory test, the rolls selected as in column 2 of the table given below shall constitute the test samples.

10.2.1 The inspector shall draw sample for full tests from the bulk lot at random using the technique of random sampling as given in IS:4905.

10.2.2 The length of the samples for subjecting to full test shall be 5m.

10.3 The remaining rolls of the lot shall be subjected to breaking load test only.

10.3.1 The length of the sample for breaking load test shall be 3m.

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TABLE

LOT SIZE:

No. of units (in rolls)	Sample size for full tests
Upto 25	5 or lot size whichever is less
26 to 50	8
51 to 90	13
91 to 150	20
151 to 280	32
281 to 500	50
501 to 1200	80
1201 and above	125

- 10.4 The rolls shall be supplied in continuous length of 100 meters. However shorter length of the rolls as given below may be accepted.
15% of the lot shall be of length 60m and above
10% of the lot shall be length 40m and above

11. CRITERIA FOR CONFORMITY

- 11.1 All the sample units drawn as per clause 10 above shall be tested/examined to the relevant requirement/specification. If all the sample units are found to conform to the specified particulars, as given in any specification, the supply shall be considered to be in conformity, otherwise not.

12. INSPECTION


- 12.1 If, on examination, material from any portion of a consignment is found not conforming fully to the specification, the whole consignment is liable to be rejected.
12.2 If on examination of 20 % of any delivery, 20% of those examined are found not conforming to this specification in any respect, then the whole consignment may be rejected
12.3 All rolls not fully in accordance with this specification shall be rejected.

13. WARRANTY

- 13.1 The stores supplied, against this order, shall be deemed to bear a warranty of the contractor against defective material, poor workmanship and performance for a period of 12 months from the date of receipt of the stores at consignee's depot. If, during the period, the stores supplied are found by the consignee to be defective, the same shall be replaced immediately with serviceable stores as per specification by the contractor at site, free of any charge or cost.

14. PACKAGING

- 14.1 The tape shall be supplied in rolls of continuous length without joints, of 100 m or as required by the procuring authority.
14.2 appropriate number of roll shall be arranged in cylindrical bundles and secured by jute twine ply to form a unit pack. Suitable number of such unit packs shall be arranged and wrapped with 0.04 mm thick polythene film. Alternatively, one layer of paper wrapping followed by one layer of paper packing water proof can be used in emergent condition when polythene film 0.04 mm is not readily available. It shall be then placed in cases wood packing provided with liners water proof bag. The empty spaces if any shall be filled in with cushioning material to prevent any movement of the contents inside the cases wood packing and the top lid of cases shall be nailed in. Care shall be exercised that the nails do not pierce the contents inside the cases wood packing. The cases wood packing shall be secure by fastening with metal hoops or metal wire.
14.3 Packing material used should be best trade quality and previously approved by Inspecting Officer.

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- 14.4 The gross mass of the box shall not exceed 40 kg.
- 14.5 If ordered for delivery to a local Inspecting Depot, the store shall be delivered loose in firm's returnable packs. After inspection, the accepted supplies shall be packed by the contractor concerned as indicated in para 14.2 above.
- 14.6 Before dispatch, each case wood packing (CWP) shall be legibly and indelibly marked showing the following details:
- a) Nomenclature and D S Cat number of the store.
 - b) Quantity packed in each CWP.
 - c) Serial no. of the CWP.
 - d) Month and year of packing.
 - e) Name and trade mark of the manufacturer.
 - f) Gross mass of each CWP in Kg.
 - g) Name and address of the consignee.
 - h) Inspection Note No. and date.

15. DEFENCE STORES CATALOGUE NUMBER

15.1 Not yet allotted.

16. SUGGESTION FOR IMPROVEMENT

16.1 Any suggestion for improvement of this document may be forwarded to the Director, ADRDE, Agra Cantt - 282 001.

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APPENDIX 'A'

PARTICULARS OF TAPE NYLON 25 MM 4440 N AND TAPE TUBULAR NYLON BRAIDED 18 MM 6870 N

Type	Width, mm	Thickness (under 200 g/cm ² pressure), max, mm	Ends in full width, min	Picks or plaits per dm, min	Linear density of yarn, Tex (tolerance -5% to 10%)		Mass per unit length, max g/m	Breaking load on full width x 20 cm, min N	Elongation at break, min %	Weave
					Warp	Weft				
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
I	25.0±0.5	0.85	60	280	140×1	23.3×1	12.0	4440	18	2/2 Broken Twill
II	18.0±0.5	2.2	48	34±4	186.7×2	-	22.0	6870	20	Braided

Note:

- i. Plaits per dm in Type II shall be determined as per the method given in Annex 'D' of IS: 4227.
- ii. In case of dyed tape, 5% relaxation shall be allowed in mass per unit length and extension at break.

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APPENDIX 'B'

CLASSIFICATION OF DEFECTS

1. The following defects found in metre-by-metre examination are classified as major/minor.


a) **Major defects detectable visually during inspection**

Defects	Description	Major
Abrasion	Abrasion resulting in broken filaments, rupture of individual yarn and distortion in the orientation of threads	X
Broken and missing threads (ends/picks)	Two or more, regardless of length	X
Coarse or light filling bar	Extending for more than 13 mm in the length direction or more than 50 % of width resulting in visible differences in thickness	X
Floats skips	Single float or skip over 1 cm or more in length	X
	Contiguous float, the sequence of which measures 0.5 cm or more in length	X
	Any multiple float 5 mm square or more	X
Jerked-In filling	Any jerked-in filling occurring 4 times within 25 cm	X
Edge cut, torn or frayed	Complete separation of one or more yarns within 3 mm of the edge or at any adjoining point	X
Mispick or double pick	Two or more additional picks across full width	X
Slack end	Two or more for a minimum of 13 mm in length	X
Loose, Irregular and uneven Selvedges	Clearly noticeable waviness along selvedge edge when no tension is on selvedge	X
Selvedge tight	Any clearly noticeable roll of edge or edges when tension is released.	X
Spot, stain	Single thread 40 cm or more in length	X
	Double threads 20 cm or more in length	X
	Over two threads 12 cm or more in length or clearly noticeable area more than 6 mm ² , whichever is greater	X
Slubs or strip back*	More than 5 over 1 cm in length	X
	Two to five over 2 cm in length	X
	One over 5 cm in length	X
Smash	Any smash	X
Wrong draw	Extending for more than 25 cm	X

* A strip back in defined as a broken filament (s) wrapped around the remaining yarns forming an enlarged area resembling a slub.

b) **Minor defects detectable visually during inspection**

The classification of the defects defined under clause a) above, may be considered minor, if it exists to a lesser degree than that given under the column 'Description'.

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2. Acceptance of rolls with defects

- 2.1 Each roll shall be visually examined for defects as described in a) and b) above. No roll shall contain more than 5 major defects per 100 m or 18 minor defects per 100 m. For this purpose, all the rolls shall be visually examined metre by metre and the defects classified in accordance with a) and b) of Appendix 'B'. The unit of product for examination shall be one linear metre. For each unit of product, the defects shall be counted as follow:
- i) One major defect and one minor defect shall be counted as one major defect.
 - ii) Three or more minor defects shall be counted as one major defect.
 - iii) A continuous major defect shall be counted as one major defect for each unit of product or fraction there of in which it occurs.
- 2.2 Each major defect shall be flagged by a red string sewn in the selvedge. Each minor defect shall be flagged by a blue string sewn in the selvedge. Three or more minor defects occurring per linear metre shall be flagged by a red string sewn in the selvedge.
- 2.3 An allowance of 50 cm shall be claimed for each major defect flagged except for continuous defects, which shall be given an allowance of one metre for each metre in which it occurs. An allowance of 16 cm shall be claimed for each minor defect flagged.