 Prepared By: Dev Kishan Bairwa Sc 'B', TG(TE)		Specification No. ADRDE/SPECN/1993/44(a)		Revision no: 1 Dated: 17/06/2019
		Reviewed By: Gaurav Singh Sc 'E', TG(TE)	Issue: 02 Dated:	Page 1 of 10

Government of India
Ministry of Defence

Specification
For

**Tape Nylon Various Undyed/Dyed, Webbing Nylon 43mm Undyed and
Cord Nylon 66**

Approved by


[Signature]
25/6/19

Group Director

Technology Group (Textile Engineering)




Aerial Delivery Research and Development Establishment
Ministry of Defence
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Agra Cantt - 282 001

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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 'B', Column 5</u> For : Thickness at a pressure of 500 g/cm ² , mm Amendment: Thickness at a pressure of 200 g/cm ² , max, mm	Director ADRDE	GD, TG(TE)	
2	<u>Appendix 'B', Column 9, 10, 11 & 12</u> For : Suggested Particulars Amendment: Deleted			
3	<u>Appendix 'B', Column 9</u> For : No. of spindles: 24 Amendment: No. of spindles: 32			
4	<u>Appendix 'B', Column 10</u> For : Total no. of ends: 72 Amendment: Total no. of ends: 96			
5	<u>Appendix 'B', Column 12</u> For : Linear density of yarn, Tex: 23.3x16 Amendment: Linear density of yarn, Tex: 93.3x1			

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0 **FOREWORD**

0.1 This specification 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, Webbing nylon 43mm and Cord Nylon 66.

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 i.e. Director, ADRDE, Agra.

0.5 Copies of this specification can be obtained on payment 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.

0.6 IS specifications quoted in this specification may be obtained directly from B.I.S., Manak Bhawan, 9, Bahadur Shah Zafar Marg, New Delhi - 110002 or its offices located in the country.


1.0 **SCOPE**

1.1 This specification covers the requirement of woven tape textile nylon various undyed/dyed, webbing nylon 43mm undyed and cord nylon 66 used in the manufacture of parachutes and other miscellaneous Aerial Delivery Equipments.

2.0 **RELATED SPECIFICATIONS**

2.1 Reference is made in this specification to:

- i. IS: 2 Rules for rounding off numerical values.
- ii. IS: 1954 Methods for determination of length and width of fabrics.
- iii. IS: 7702 Method for determination of length and width of fabrics.
- iv. IS: 6359 Methods for conditioning of textiles.
- v. IS: 3442 Method for determination of crimp and count of yarn.
- vi. IS: 1963 Methods for determination of threads per unit length of woven fabrics.
- vii. IS: 1964 Methods for determination of weight per square meter and weight per linear meter of fabrics.
- viii. IS: 1969 Methods for determination of breaking load and elongation at break of woven textile fabrics.

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- ix. IS: 4905 Methods for random sampling.
- x IS: 2454 Method for determination of colour fastness of textile material to artificial light (Xenon lamp).
- xi IS:686 Method for determination of color fastness of textile material to day light.
- xii IS:764 Method for determination of color fastness of textile material to washing; test 3.
- xiii. IS: 4910, P-I Methods of test for tyre cords and tyre cord fabrics made from man-made fibre – Linear density.
- Xiv IS: 4437 Braided Nylon cord for personnel parachute.
Appendix 'A' Method for determination of plaits per decimeter.
Appendix 'B' Method for determination of weight per 100 meters.
Appendix 'A' Method for determination of breaking load and elongation of cord.
- Xv IS: 1390 Method for determination of pH value of aqueous Extracts of textile materials (cold method).
- xvi. IS: 9738 Polythene bags.
- xvii. IS: 5762 Method for determination of melting temperature/range.

2.2 All specifications referred to in this specification for any tender or contract, shall mean the current edition on the date of such tender or contract.

2.3 Indian Standard specifications are issued by the Bureau of Indian Standard and are available on payment from Sales Section, Bureau of Indian Standard (BIS), Manak Bhawan, 9, Bahadur Shah Zafar Marg, New Delhi - 110 002 or their regional offices.



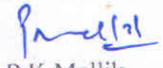
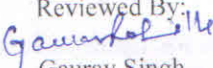
3.0 **MATERIAL**

3.1 The basic material of yarn shall be Nylon 6/Nylon 66 for tapes & webbing and Nylon 66 for cord. The yarn for both warp and weft shall be bright multifilament of high tenacity. One spool of about 200 meters of the basic yarn material along with its test results should be supplied by the firm for testing/approval before starting the production of advance sample (Ref. Clause 6).

4.0 **MANUFACTURE**

4.1 The single or folded yarn shall be evenly twisted with a minimum of 100 turns per metre (TPM). The stores shall be evenly woven under suitable tension. The edge of the tape and webbing shall be firm and regular.

4.2 The store shall be not more than one year old from the date of delivery. A certificate to this effect shall be provided by the manufacturer/contractor at the time of delivery. A piece of ten metre sample along with the test results shall be forwarded as an advance sample for approval.

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5.0 DIMENSIONS AND OTHER DETAILS

5.1 The tape textile nylon various, webbing Nylon 43mm and cord nylon 66 shall be conform to particulars given in relevant appendix.

6.0 WORKMANSHIP AND FINISH

6.1 The store shall be free from manufacturing defects. Tape and webbing when laid down on a flat even surface, the stores shall be in a straight line without application of any tension. (Also relevant IPS may be referred for such defects).

6.2 The cord and braiding ends shall be free from knots, slubs and stains. There shall be no broken threads throughout the length of cord. The finished cord shall be free from slackness.



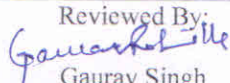
7.0 MARKING

7.1 Each roll hank shall be suitably attached with a label. The label shall be legibly and indelibly marked with nomenclature, the manufacturer's name, initial or recognized trade, year of manufacturer, length of roll and Defence Store (D.S.) Cat. Number of the store, if any.

8.0 QUALITY

8.1 Examination of the sample taken from any portion of consignment shall show that the stores conform to the requirements as given in relevant appendices when tested in accordance with the methods mentioned against each of the following.

a	Length	As per col 3 of appx – A&B	IS:1954
b	Width	As per col 4 of appx – A&B	IS:1954
c	Thickness	As per col 5 of appx – A&B	IS:7702
d	Mass in g per m	As per col 6 of appx – A&B	IS:1964
e	Total number of ends in full width	As per col 9 of appx – A&B	IS: 1963
f	Picks per cm	As per col 10 of appx – A&B	IS: 1963
g	Breaking Load (on full width x 20 cm)	As per col 7 of appx – A&B	IS: 1969
h	pH value Aqueous extract	6.0 to 8.5	IS: 1390 (cold method)
i	Dye Fastness		
	(i) To Light	Class 5 or better	IS: 686 or IS:2454
	(ii) Washing	No colour bleeding white wool/viscose	IS:764
j	Linear Density of Yarn	As per Col 11 & 12 of Appx - A	IS: 3442

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9.0 **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.

10.0 **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 The Inspector shall draw samples for full tests from the bulk lot at random using the technique of simple random sampling as given in IS: 4905.
- 10.3 Number of samples to be drawn for full laboratory tests shall be equal to 10% of rolls supplied by the manufacturer/contractor. The length of the sample for full test shall be 5 mtrs.
- 10.4 A three meter sample each from the remaining 90% rolls shall be drawn for width, thickness wt/ mtr and breaking load test only.

11.0 **CRITERIA FOR CONFORMITY**




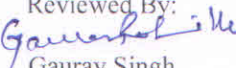
- 11.1 All the sample units drawn as per clause 10.2 above shall be tested/examined to the relevant specification requirement. If all the sample units are found to conform to the specified particulars, the supply shall be considered to be in conformity, otherwise, not.

12.0 **INSPECTION**

- 12.1 If, on examination of any sample taken from any portion of consignment, the material is not found to be not fully in accordance with this specification, the whole consignment may be rejected.

13.0 **WARRANTY**

- 13.1 The stores supplied against the order, shall be deemed to bear a warranty of the contractor against defective material, poor workmanship and performance for a period of twelve 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 this specification by the contractor at site, free of any charge or cost.

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14.0 **PACKAGING**


- 14.1 The length of the roll shall be 100 m in case of tape/webbing and 200 m in case of cord or as required by the procuring authority. The appropriate number of rolls shall be arranged in cylindrical bundles and secured by jute twine to form a unit pack. Suitable number of such 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 conditions when polythene film 0.04 mm thick is not readily available. It shall be placed in corrugated Cardboard Container (CCBC) or Case Wood. Packing (CWP) provided with liners waterproof bag. The empty spaces if any shall be filled in with cushioning material to prevent any movement of the contents inside CCBC/CWP.
- 14.2 Packing material used should be of best trade quality and previously approved by the Inspecting Officer.
- 14.3 If the store is intended for factory use, the gross mass of each package shall not exceed 100 kg.
- 14.4 For Director Ordinance Services (DOS) packing, the gross mass of packages shall not exceed 40 kg.
- 14.5 If ordered for delivery to local Inspection Depot, the cord shall be delivered loose in firm's returnable packs. After inspection, the accepted supplies shall be packed by Inspection Depot authorities as indicated in Para 17.1 above
- 14.6 Before dispatch, each CCBC/CWP shall legibly and indelibly mark showing following details:
- a) Nomenclature and defence Cat number of the store.
 - b) Quantity packed in each CCBC/CWP.
 - c) Serial no. of CCBC/CWP.
 - d) Month and year of packing.
 - e) Name and trade mark of the manufacturer.
 - f) Gross mass of each CCBC/CWP in kg.
 - g) Name and address of the consignee.
 - h) Inspection Note number and date.

15.0 **DEFENCE STORES CATALOGUE NUMBER**

15.1 Not yet allotted.

16.0 **SUGGESTION FOR IMPROVEMENT**

16.1 Any suggestion for improvement of this document may be forwarded to the Director, ADRDE, Agra Cantt. - 282001

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Appendix 'A'

Type	Nomenclature	Roll Length, m	Width mm	Thickness*, max mm	Mass, max g/m	Breaking Load on full width x 20 cm, min Newton	Weave	No. of ends in full width	Suggested Particulars		
									Picks/dm	Linear Density of yarn, Tex	Warp
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
I	Tape, Nylon 13mm, OG	100 or as agreed	13 ± 1	1.1	8.5	2250	2/2 Pointed Twill with one reversal at centre	52	125	93.3x1	93.3x1
II	Tape, Nylon 16mm, U/D	-do-	16 ± 1	1.2	11.5	3920	- do -	79 + 1 green at centre	105	93.3x1	93.3x1
III	Tape, Nylon 20mm, U/D	-do-	20 ± 1	0.95	9.0	1960	- do -	52 + 4 green & 2 yellow at centre	150	93.3x1	23.3x2
IV	Tape, Nylon 20mm, OG	-do-	20 ± 1	1.7	20.5	7355	- do -	150	80	93.3x1	93.3x1
V	Tape, Nylon 30mm, OG	-do-	30 ± 1	1.2	18.5	5690	- do -	115	120	93.3x1	93.3x1
VI	Tape, Nylon 22mm, U/D	-do-	22 ± 1	2.2	27	11564	Double Plain	(Face & Back) - 77, Binder - 17	120 (Including both layers)	(Face & Back - 93.3x3 Binder - 23.3x1)	46.7x1

*Under pressure 200g/cm² (IS:7702 - 1975)



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WEBBING NYLON 43MM U/D

Appendix 'B'

S. No.	Nomenclature	Roll Length,	Width,	Thickness at 200 g/cm ² Pressure, max	Mass, max,	Breaking Load on full width x 20 cm, min	Weave	Suggested Particulars			
								No. of ends in full width	Picks/dm	Linear Density of yarn, Tex	Warp Weft
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1.	Webbing Nylon 43mm, U/D	50 or as ordered	43 ± 1	4.0	115	47040	Double Plain	Ground 182 (Face & Back), Binder - 47	63	Ground - 93.3x5 Binder - 93.3x1	93.3x3
CORD NYLON 66											
S. No.	Nomenclature	Roll Length,	Width,	Thickness at 200 g/cm ² Pressure, max	Mass, max	Breaking Load on 15 cm between grips, min	Construction	No. Of Spindles	Total No. of ends	No. of Plats per dm	Linear Density of yarn, Tex*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1.	Cord Nylon 66 U/D	200 or as ordered	8 ± 1	2.4	12.5	3724	Braided	32	96	55 ± 5	93.3x1

*: Tolerance of -3 to +8%