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JSS 4020-8
1981

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RAKSHA MANTRALAYA
MINISTRY OF DEFENCE

JOINT SERVICE SPECIFICATION

CORD, NYLON, BRAIDED 1785 N FOR
PERSONNEL PARACHUTES

(DS Cat No. 4020 - 000 293)

CORD, NYLON, BRAIDED 2452 N FOR
PERSONNEL PARACHUTES

(DS Cat No. 4020-000 299)

Issued by

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DEPARTMENT OF DEFENCE PRODUCTION
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NEW DELHI-110 011

[Signature]
29/11/83
CGIB SINGHI
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CONTROLLER,
CONTROLLERATE OF QUALITY ASSURANCE
TEXTILES & CLOTHING, P.B. No. 284
KANPUR-208 001

[Signature]
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RECORD OF AMENDMENTS

Amendment No.	Sub-heading to which amendment pertains	Authority	Incorporated by Name and Rank in block letter	Initials
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JOINT SERVICES SPECIFICATION

CORD, NYLON, BRAIDED 1735 N FOR
PERSONNEL PARACHUTES

(DS Cat No. 4020-000 299)

CORD, NYLON, BRAIDED 2402 N FOR
PERSONNEL PARACHUTES

(DS Cat No. 4020-000 299)

0. FOREWORD

0.1 This specification has been prepared by the Standardisation Sub-Committee on the authority of the Standardisation Committee, Ministry of Defence.

0.2 This specification is approved by the Ministry of Defence and is mandatory for use by the Defence Services. It supersedes provisional Specification No. 3147/22 (a).

0.3 This JSS would be used to guide design, manufacture, inspection and procurement of the item.

0.4 Enquiries regarding this specification in relation to any contractual conditions should be addressed to the Inspection authority named in the tender or contract; other enquiries will be referred to the Directorate of Standardisation, Ministry of Defence, New Delhi-110011.

0.5 Copies of this specification can be obtained on payment from

Directorate of Standardisation
Ministry of Defence
NEW DELHI-110011

or concerned Inspection Authority of Ministry of Defence viz
Controller of Quality Assurance
Chief Inspectorate of Textiles & Clothing
Post Box No. 294,
KANPUR-208004

or

Asst. Controller (Stock)
(Army JSS Publication)
Department of Publication
Government of India
Civil Lines, Delhi-110054

1. SCOPE

1.1 This specification covers the requirements and method of test for cord nylon braided 1785 N and 2452 N breaking load, white. These are continuous filament nylon cords of braided construction having parallel thread in the cord and are used as rigging lines in personnel parachutes.

2. RELATED SPECIFICATIONS

2.1 Reference is made in this specification to:

- i) IS: 280 - Mild steel wire for general engineering purposes.
- ii) IS: 1029 - Hot rolled steel strips (baling)
- iii) IS: 1390 - Methods for determination of pH value of aqueous extracts of textile materials.
- iv) IS: 1397 - Kraft paper.
- v) IS: 1398 - Packing paper, waterproof, bitumen-laminated
- vi) IS: 1503 - Wooden packing cases.
- vii) IS: 2508 - Low density polyethylene films
- viii) IS: 4356 - Paper cuttings.
- ix) IS: 4437 - Braided nylon cord for personnel parachutes.
- x) IS: 4905 - Methods for random sampling.
- xi) IS: 1315 - Method for determination of linear density of yarns spun on cotton system.

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

2.3 Indian Standard Specifications are issued by the Indian Standards Institution and are obtainable on payment from the Sales Section, Indian Standards Institution, Manak Bhavan, 9, Bahadur Shah Zafar Marg, New Delhi-110002 or their regional offices.

3. MATERIAL

3.1 The Nylon yarn used in the manufacture of the cord shall be of 23 tex bright high tenacity, type 6⁶ or 6.

4. MANUFACTURE

4.1 The yarn shall first be suitably twisted and doubled to the requirement given in clause 5 below, and shall not be subjected to any stretching operation. During the process of throwing, tension applied shall not be unduly high. The braiding machine shall be so adjusted that it gives a firm and tight braiding without putting any undue tension on the yarn.

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4.2 The cords shall be identified by the inclusion of one black coloured thread in the sheath. The black colour should be obtained by dyeing the thread with acid type dyes.

4.3 The cordages shall essentially be smooth to handle and shall have uniform diameter throughout with round cross-section.

4.4 The cord shall not be more than one year old from the date of manufacture to the date of delivery.

5. DIMENSIONS AND OTHER DETAILS

5.1 The cord shall conform to the following essential particulars

	Cordage Nylon Braided			
	1735	2452		
	Core	Sheath	Core	Sheath
a) Yarns	23	23	23	23
1) Linear Density, Tex				
ii) Ply - Ist	5	3	5	3
- Final	3	-	3	-
b) Turns per metre	40	330±50	40	330±50
1) Spin	(approx)		(approx)	
ii) Ply - Ist	520±120	240±40	520±120	240±40
- Final	280±40		280±40	
c) No. of core ends	7	-	9	-
d) No. of ends in sheath	-	32	-	32
e) No. of spindles	-	32	-	32

6. WORKMANSHIP AND FINISH

6.1 The cord shall be free from any manufacturing flaws. The core and braiding ends shall be free from knots, slubs and stains, however, splicing of core yarns is permissible provided the overlap is more than 13 cms but does not exceed 25 cms in length.

7. MARKING

7.1 Each hank/ ball shall be tied with a card board label of size 45 x 25 mm on which manufacturers name, initials or recognised trade mark, year of manufacture, length of the hank/ball, nomenclature and D3 Cat number of the store shall be marked.

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QUALITY

8.1 Examination of the samples taken from any portion of a consignment, shall show that the cord conform to the following requirements when tested in accordance with the methods mentioned against each:-

Tests	Requirements		Methods (refer to)
	Cordage nylon braided 1785 N	Cordage nylon braided 2452 N	
(a) Linear density of yarn (tex)	23	23	S: 1315
(b) Plaits per dm	105 ± 5	105 ± 5	Appendix 'A' (attached)
(c) Mass/100 m (in g) Max	475	665	Appendix 'B' (attached)
(d) Breaking load (15 cm between grips in N) Min	1785	2452	IS: 4437 (Appendix 'C')
(e) Elongation at break per cent, Min.	30	30	IS: 4437 (Appendix 'C')
(f) pH value of aqueous extract	6.0 to 8.5	6.0 to 8.5	IS: 1390 (Cold method)

Note:- No individual reading should be less than specified.

9. PRE-INSPECTION OF STORES/CONSIGNMENT

9.1 Manufacturers/Contractors must satisfy themselves that the stores are in accordance with the terms of the contract and fully conforms to the required specification by carrying out 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 alongwith 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.

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10. SAMPLING

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

10.2 The Inspector shall draw samples from the bulk lot at random using the technique of simple random sampling as given in IS: 4905.

10.3 For evaluating, yarn, turns per metre, number of ends in core and sheath, number of spindles and number of plaits per dm, the rolls selected as in col 2 of the table given below shall constitute the sample. Number of rolls found defectives should not exceed the corresponding number given in col 3 of the table. In case of length the value obtained for each roll shall be compared with its specified declared or marked length. The mean percentage of deficiency in length if any shall be determined as made applicable to the lot.

10.4 For evaluating other laboratory tests the number of rolls specified in col 4 of the table shall constitute the test sample.

10.5 The length of the sample for subjecting to full tests shall be 5 metres. A 3 metres samples shall also be drawn from the remaining lot for breaking load test only.

TABLE

Lot Size (Rolls)	Sample size (No. of rolls to be selected) for (visual examination)	Permissible No. of def- ective rolls	Sub-sample size (No. of rolls to be selected for lab. tests)
1	2	3	4
up to 25	*5	1	3
26 - 50	8	0	5
51 - 100	13	1	7
101 - 150	20	2	9
151 - 300	32	3	11
301 - 500	50	5	13
501 - 1000	80	7	15

* or lot size which ever is less.

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CRITERIA FOR CONFORMITY

All the sample units drawn as per clause 10.2 above shall be examined to the relevant specification requirements. If all units are found to conform to the specified particulars given in the table, the supply shall be considered to be in conformity otherwise not.

REJECTION

If, on examination of any sample taken from any portion of the material, the material is found to be not fully in accordance with the specification, the whole supply shall be rejected.

WARRANTY

The goods supplied against the order shall be deemed to bear the liability of the contractor against defective material, workmanship and performance for a period of twelve months from the date of receipt of goods at consignee's depot. If during this period the goods supplied are found by the consignee to be so defective, they shall be replaced immediately with serviceable stores by the contractor at site free of any charge or cost.

PACKAGING

10.1 Material - The following material shall be used for the packing of the goods nylon braided.

- 10.1.1 low density polyethylene film. - Conforming to IS: 2508
- 10.1.2 Kraft Paper - Conforming to IS: 1397
- 10.1.3 packing paper, waterproof bitumen-laminated. - Conforming to IS: 1398
- 10.1.4 Jute or wood packing - Conforming to IS: 1503
- 10.1.5 Paper cuttings - Conforming to IS: 4356
- or any other suitable cushioning material - Approved by the Inspection Authority.
- 10.1.6 Mild steel hoops - Conforming to IS: 1029
- or Mild steel wires - Conforming to IS: 280

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CRITERIA FOR CONFORMITY

10.1 All the sample units drawn as per clause 10.2 above shall be examined to the relevant specification requirements. If all sample units are found to conform to the specified particulars given in the table, the supply shall be considered to be in conformity otherwise not.

REJECTION

10.2 If, on examination of any sample taken from any portion of the material, the material is found to be not fully in accordance with the specification, the whole supply shall be rejected.

WARRANTY

10.3 The store supplied against the order shall be deemed to bear the responsibility of the contractor against defective material, workmanship and performance for a period of twelve months from the date of receipt of stores at consignee's depot. If during this period the stores supplied are found by the consignee to be so defective, they shall be replaced immediately with serviceable store by the contractor at site free of any charge or cost.

PACKAGING

10.4 Material - The following material shall be used for the packing of the store nylon braided.

10.4.1 low density polyethylene film. - Conforming to IS: 2508

10.4.2 Kraft Paper - Conforming to IS: 1397

10.4.3 packing paper, waterproof bitumen-laminated. - Conforming to IS: 1398

10.4.4 Jute wood packing - Conforming to IS: 1503

10.4.5 Paper cuttings - Conforming to IS: 4356

or any other suitable cushioning material - Approved by the Inspection Authority.

10.4.6 Mild steel hoops - Conforming to IS: 1029

or Mild steel wires - Conforming to IS: 280

14.2 Method:

14.2.1 Cord nylon braided 1785 m shall be supplied in continuous hank/ball length of 341 m & 260 m and cord nylon braided B160 in hank/ball length of 351 m or as required by the indenter.

14.2.2 The hank/ball of cord shall be packed in a polythylene bag to form a unit pack.

14.2.3 There will be two varieties of packages i.e. 40 kg and 250 kg and the gross mass of the package should not exceed this limit.

14.2.4 In all cases except for the stores meant for Ordnance Factories, the gross mass of the package shall not be more than 40 kg. In case the stores are consigned to Ordnance Factories the gross mass of the package shall not be more than 250 kg, and the number of bands of metal hoops/wires shall be so adjusted that no two hoops/wires are more than 25 cm apart.

14.2.5 The number of unit packs (arrangement given below depending upon the end use of each type of nylon cord and type of package) shall be properly arranged and wrapped with packing paper waterproof bitumen-laminated.

Variety of Cord nylon and its length	Number of unit pack in a pack of 40 kg gross mass	Number of unit pack in a package of 250 kg gross mass
i) Cord nylon braided 1785 m in hank length of 341 m	20	140
ii) Cord nylon braided 1785 m in hank length of 260 m	25	180
iii) Cord nylon braided 2452 m in hank length of 351 m	12	80

14.2.6 The wrapped pack shall be placed in cases wood packing provided with liners waterproof bag. The empty spaces, if any, shall be filled with paper cuttings or with any other suitable cushioning materials to prevent any movement of the content inside the wooden packing case during transit.

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14.2.7 The top lid of the cases shall be nailed in properly. The packing cases shall be bound with at least 2 bands of metal hoops or alternatively with metal wire adjacent to the girth battens as far as possible but not over them.

14.3 Marking: Before despatch the cases shall be legibly and indelibly marked as under.

a) Front and Top

- i) DB Cat number and nomenclature of the store.
- ii) Quantity packed, preceded by abbreviation 'QTY'.

b) Back

- i) Name and address of consignee.
- ii) Mass of the package in kg.
- iii) Number of individual packages and total number of packages in the consignment eg. 1 of 4, 2 of 4, 3 of 4, 4 of 4, when the consignment consists of 4 packages.

c) Lift end

- i) ~~Consignee~~ / Consignors name and address.
- ii) Month and year of packing.
- iii) Voucher number and date.

14.4 If ordered for delivery to a local Inspection Depot, the store shall be delivered loose in firms returnable packs. After inspection the accepted supplies shall be packed by the Inspection Depot authorities as per clause 14.1 to 14.3 given above.

15. DEFENCE STORES CATALOGUE NUMBER

15.1 The cord covered by this specification shall bear the following Cat numbers:

DB Cat No.s

4020-000298

Nomenclature

Cord nylon, braided 1735 W for personal parachutes.

4020-000299

Cord nylon, braided 2452 W for personal parachutes.

16. SUGGESTION FOR IMPROVEMENTS

16.1 Any suggestions for the improvement of this document may be forwarded to the Director, Directorate of Standardisation, Ministry of Defence, New Delhi-110011

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APPENDIX 'A'

METHOD FOR DETERMINATION OF PLAITS PER DECIMETER

Prior to test, the test specimens shall be conditioned in a standard atmosphere at 65 ± 2 percent relative humidity and $27^{\circ}\text{C} \pm 2$ deg C temperature for at least 24 hours. Take a test specimen and apply a tension equal to one per cent of the minimum breaking load of the cord. After 60 ± 5 seconds, count the number of plaits in a decimetre under the load and calculate the average plaits per decimetre.

APPENDIX 'B'

METHOD FOR DETERMINATION OF MASS PER 100 METRE

Prior to test, the test specimens shall be conditioned in a standard atmosphere at 65 ± 2 per cent relative humidity and $27^{\circ}\text{C} \pm 2$ deg C temperature for at least 24 hours. Take a test specimen and apply a tension equal to one per cent of the minimum breaking load of the cord. After 60 ± 5 seconds, place two marks on the cord at a distance of 3 metres apart under the load and cut the test specimen at the marks and determine its mass to the nearest one gram, calculate the mass of the cord per 100 metres.

"SHYAMJI"
FEB'1988