MIL-C-17183B(AS)

3 December 1969

SUPERSEDING
MIL-C-17183A(NOrd)
6 February 1956

MILITARY SPECIFICATION

CORD, NYLON, BRAIDED, TUBULAR, SPLICEABLE

This specification has been approved by the Naval Air Systems Command, Department of the Navy.

1. SCOPE

1.1 This specification covers tubular braided nylon cord designed specifically for telescopic splicing. (See 6.3 for textile definitions.)

1.2 Classification. - The cord shall be of the types specified in Table I. (See 6.2)

2. APPLICABLE DOCUMENTS

2.1 The following specifications and standards, of the issues in effect on the date of invitation for bids or request for proposal, form parts of this specification to the extent specified herein:

SPECIFICATIONS

FEDERAL

UU-T-81	Tags, Shipping and Stock

FSC 4020

MILITARY

MIL-C-3131	Cordage; Preparation for Delivery of

STANDARDS

FEDERAL

FED. TEST METHOD STD. NO. 191	Textile Test Methods

MILITARY

MIL-STD-105	Sampling Procedures and Tables for Inspection by Attributes

(Copies of specifications and standards required by suppliers in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

3. REQUIREMENTS

3.1 Preproduction sample. - This specification contains provisions in 4.3 for a preproduction (first article) sample.

3.2 Material requirements. - The cord, including the yarn entering into the construction thereof, shall conform to the following requirements when tested and examined in accordance with 4.7 and 4.8.

3.2.1 Yarn requirements.

3.2.1.1 Filaments. - Filaments shall be a polyamide product obtained from the reaction of hexamethylene diamine and adipic acid. Filaments obtained from any other reaction or process shall not be used.

3.2.1.2 Yarn type. - The yarn shall be a high tenacity bright nylon.

3.2.1.3 Yarn construction. - The yarn construction (denier, color, and twist) shall be in accordance with Table I.

3.2.2 Yarn and cord requirements.

3.2.2.1 Color. - Unless specified in the order (see 6.2), the color shall be natural. When a color is specified, the coloring shall be accomplished by dyeing the yarn before weaving or by dyeing the cord under uniform tension throughout. The use of sulfur dyes and the dyeing of cord in skeins are prohibited.

3.2.2.2 Twist and turns. - All cord supplied under one order must be constructed of yarn having the same twist. The turns in the ends woven from the yarn shall be in the same direction as the twists in the yarn.

3.2.3 Cord requirements.

3.2.3.1 Shrinkage. - After braiding, the cord shall be heat set in continuous lengths so that the residual shrinkage shall not be greater than 3 percent.

3.2.3.2 Cord construction. - The construction of the cord shall conform to the end, carriers, and picks per inch requirements specified in Table I. See 6.3 for definitions.

3.2.3.3 Cord physical requirements. - The physical properties of the cord shall conform to the requirements specified in Table I.

3.3 Cord imperfections. - The following cord imperfections shall be plainly marked by a colored adhesive tape on each side of the imperfection. The cord shall be examined for these imperfections in accordance with 4.8.

Table I. - Construction and physical requirements

Cord Type	YARN		END		CARRIERS		CORD			
	Denier	Yarn Twist (a)	Ply	Turns per Inch (a)	Number of Carriers (b)	Ends per Carrier	Picks per Inch (g)(h)	Weight Yds/Lb, min.	Breaking Strength, Lbs, min.	Elong. %, min.
I	70	S or Z	1	¼ to 1	16	4	17	900	50	20
II	210	S or Z	1	¼ to 1	16	3	16	400	100	20
III	210	S or Z	3	2½ to 3½	16	(c)	14.5	225	200	20
IV	210	S or Z	3	2½ to 3½	16	(d)	13	150	300	20
V	210	S or Z	3	2½ to 3½	16	3	12	110	400	20
VI	210	S or Z	4	2½ to 3½	16	3	11	90	500	20
VII	210	S or Z	3	2½ to 3½	16	6	9.5	50	750	20
VIII	210	S or Z	4	2½ to 3½	16	6	8.5	40	1000	20
IX	210	S or Z	4	2½ to 3½	16	7	7.5	35	1250	20
X	210	S or Z	4	2½ to 3½	16	9	7	30	1500	20
XI	210	S or Z	4	2½ to 3½	16	10	6.5	25	1750	20
XII	210	S or Z	4	2½ to 3½	16	12	6	20	2000	20
XIII	210	S or Z	4	2½ to 3½	16	13	5.5	17	2250	20
XIV	210	S or Z	4	2½ to 3½	16	14	5.25	15	2500	20
XV	210	S or Z	4	2½ to 3½	24	12	7	12	3000	20
XVI	210	S or Z	4	2½ to 3½	24	14	6.5	10	3500	20
XVII	840	S or Z	4	2½ to 3½	24	4	6.25	9	4000	20
XVIII	840	S or Z	4	2½ to 3½	24	(e)	6	8	4500	20
XIX	840	S or Z	4	2½ to 3½	24	5	5.5	7	5000	20
XX	840	S or Z	4	2½ to 3½	24	(f)	5.25	6	5500	20
XXI	840	S or Z	4	2½ to 3½	24	6	5	5	6000	20

NOTES:
(a) See para. 3.2.2.
(b) The braiding machine shall be regulated to give a two over, two under conventional stitch.
(c) 8 carriers of 1 end each, 8 carriers of 2 ends each, alternately.
(d) 8 carriers of 2 ends each, 8 carriers of 3 ends each, alternately.
(e) 12 carriers of 4 ends each, 12 carriers of 5 ends each, alternately.
(f) 12 carriers of 5 ends each, 12 carriers of 6 ends each, alternately.
(g) The pick count, as used herein, is defined as the number of carrier crossings per inch in a single straight line in the longitudinal direction of the cord.
(h) Pick count shall have a tolerance of ±10%.

3.3.1 Splicing. - When carrier ends run off, they shall be spliced a distance of five to ten inches. In splicing, the outgoing carrier ends shall be joined with the new ends and hand braided for four to five picks and the tail of the splice shall be run into the center of the braided cord.

3.3.2 Detrimental imperfections. - The following imperfections affect the strength, durability, and end use of the product; permissible limits shall be as specified in 3.3.2.1:

a. Kinks
b. Thick and thin sections
c. Missing ends
d. Broken ends projecting from the surface
   Note: Loose ends, which appear at the surface due to bobbin changes, are allowable if neatly clipped even to the surface of the cord.
e. Knots in plied yarn
   Note: The occasional knots in single yarns prior to twisting into ends are allowable.

3.3.2.1 Permissible limits on detrimental imperfections. - Permissible limits on the detrimental imperfections of 3.3.2 shall be:

a. One imperfection within each 10 yard length
b. No imperfections within 10 yards of each end of the cord

3.4 Allowance for imperfections. - Under any contract or order, one additional yard of cord shall be supplied for each imperfection.

3.5 Spooling.

3.5.1 Spooled lengths. - Each spool shall contain the length specified in 6.2; a plus tolerance of 10% per a spool shall be allowable. The spooled length shall be continuous without knots, without splicing, and each turn and layer shall be free from entanglement.

3.5.2 Spooled ends. - Each end of a spooled length of cord shall be taped, served, or heat-sealed to prevent fraying.

3.6 Identification. - Each spool or reel shall be identified as specified in 5.3.1.

3.7 Delivery. - The spools shall be prepared for delivery in accordance with Section 5.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. - Unless otherwise specified in the contract or purchase order, the supplier is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or order, the supplier may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

4.1.1 Certificate of compliance. - Where certificates of compliance are submitted, the Government reserves the right to check test such items to determine the validity of the certification.

4.2 Classification of inspections. - The inspection requirements specified herein are classified as follows:

a. Preproduction (first article) sample inspection (See 4.3)
b. Quality conformance inspection (See 4.4)

4.3 Preproduction sample inspection. - Prior to entering into production, the contractor shall deliver a preproduction sample of 30 yards of cord to a testing activity designated by the Government. This sample shall be manufactured at the same site using the same materials and methods proposed for production and shall be inspected in accordance with 4.7 and 4.8 to determine conformance of the cord with the requirements of the contract and this specification. Further production of the cord, prior to approval of the preproduction sample by the procuring activity, shall be at the contractor's risk. Acceptance of the preproduction sample shall be in accordance with 4.9. Conforming samples shall become the property of the procuring activity and will be included in the quantity called for in the contract schedule. (See 6.2)

4.3.1 Preproduction sample for a subsequent contract. - When production under a new contract by the same contractor at the same location follows the manufacture of cord conforming with the requirements of this specification, the necessity for a preproduction sample will be determined by the procuring activity.

4.4 Inspection lot. - The inspection lot, size, formation, and definition shall be in accordance with MIL-STD-105 and shall be limited to the cord produced from one batch or inspection lot of yarn. A unit of product within the inspection lot shall be a reel or spool of cord; the quantity of cord thereon and the size of the spool or reel shall be as specified in the contract or order. (See 6.2)

4.5 Quality conformance inspection.

4.5.1 Visual examination. - From each inspection lot, reels of cord shall be selected at random in accordance with MIL-STD-105, Level II. Each selected reel and its leading 100-foot length of cord shall be visually examined for the characteristics specified in Table IV of 4.8. Acceptance shall be in accordance with 4.9.1.

4.5.2 Tests.

4.5.2.1 Yarn tests. - From each inspection lot, three one-foot length samples of cord shall be taken from three different reels. These samples shall be representative of the batch or lot of yarn (see 4.4) used in the manufacture of the cord. Testing shall be in accordance with Table II of 4.7.1 to assure conformance with the related requirements of Section 3. Acceptance shall be in accordance with 4.9.2.

4.5.2.2 Cord tests. - From each inspection lot, reels shall be selected at random for testing in accordance with MIL-STD-105, Level S-3. A 12-foot length of cord shall be taken from each selected reel and shall be tested in accordance with Table III of 4.7.2 to assure conformance with the related requirements of Section 3. Acceptance shall be in accordance with 4.9.2.

4.6 Testing conditions.

4.6.1 Testing facilities. - The contractor shall furnish and maintain all testing facilities, equipment and personnel necessary for performing all of the inspections specified herein. Testing equipment shall be adequate in quantity, quality, and accuracy to permit performance of the specified tests.

4.6.2 Atmospheric conditioning. - Unless otherwise specified in the applicable test method or procedure, the tests specified herein shall be made under prevailing atmospheric conditions. In case of dispute, the tests shall be made on specimens which have been preconditioned and then brought to Standard Conditions as specified in Fed. Test Method Std. No. 191.

4.7 Test methods.

4.7.1 Yarn test methods. - The applicable sampled cord of 4.3 and 4.5.2.1 shall be tested in accordance with the test methods specified in Table II to assure conformance with the related requirements of Section 3. Except as otherwise specified in Table II, the related test methods are those of Fed. Test Method Std. No. 191. Acceptance shall be in accordance with 4.9; a supplier's certificate of compliance will be accepted as verification of the requirements of Table II.

Table II. - Yarn tests.

Requirement	Requirement paragraph	Test Method
Filament identification	3.2.1.1	1530
Yarn type (tenacity)	3.2.1.2	ASTM D 540
Denier	3.2.1.3	4021
Twist	3.2.1.3	4050
Color	3.2.2.1	(a)

Note: (a) Visual examination

4.7.2 Cord test methods. - The applicable sampled cord of 4.3 and 4.5.2.2 shall be tested in accordance with the test methods specified in Table III to assure conformance with the related requirements of Section 3. Except as otherwise specified in Table III, the related test methods are those of Fed. Test Method Std. No. 191. The test report for each test method shall report the average and range of results for each reel tested. Acceptance shall be in accordance with 4.9.

Table III. - Cord tests

Requirement	Requirement paragraph	No. of determinations per sample reel	Test Method
Yarn twist and end turn, sameness of	3.2.2.2	3	4050
Cord shrinkage	3.2.3.1	3	para 4.7.2.2
End turns per inch	3.2.3.2	3	4054
Cord picks per inch	3.2.3.2	1	para 4.7.2.1
Cord weight, yds per lb	3.2.3.3	3	5041
Cord breaking strength, lbs	3.2.3.3	3	4102
Cord elongation, %	3.2.3.3	3	4102

4.7.2.1 Pick count. - From each 12-foot length, a specimen suitably long to expose a five (5) inch length while under a tension load of 5 ± 1 pounds shall be cut. While under the tension load of 5 ± 1 pounds, the actual number of carrier crossings (picks) in a straight line parallel to the longitudinal direction of the cord shall be counted. After determining the pick count of each selected reel, the average pick count for the lot shall be determined and reported as follows:

$$\text{Picks per inch} = \frac{\text{Total picks counted}}{5 \times \text{Number of specimens}}$$

The average pick count shall conform to 3.2.3.2.

4.7.2.2 Shrinkage test. - Prior to cutting from the sample cord, each specimen shall have its ends whipped, taped, or heat sealed to prevent fraying. Each specimen shall be 24-inches long and brought to equilibrium in accordance with the Standard Conditions of Fed. Test Method Std. No. 191. On each specimen, mark an 18-inch length, using a water-insoluble ink or comparable medium. The specimens shall then be immersed in boiling water for 15 minutes. It may be necessary to attach weights to the ends of the specimens to insure complete immersion. At the end of the immersion period, the specimens shall be air dried or dried in a circulating air oven at a temperature not exceeding 185°F. After drying, the specimens shall again be brought to equilibrium under standard conditions and remeasured. The percent shrinkage in the original 18-inch length shall conform to 3.2.3.1.

4.8 Cord examinations. - As applicable, the preproduction sample of 4.3 and sampled reels of 4.5.1, including the leading 100-foot lengths thereof, shall be visually examined to assure conformance of the specified characteristics of Table IV with the related requirements of Section 3. Acceptance shall be in accordance with 4.9.

Table IV. - Cord examinations

Characteristic	Requirement paragraph	No. of determinations per sample reel
Carriers, number of	3.2.3.2	1
Carrier, ends per	3.2.3.2	1
Marking of imperfections	3.3	(a)
Splicing	3.3.1	(a)
Kinks	3.3.2	(a)
Thick and thin sections	3.3.2	(a)
Missing ends	3.3.2	(a)
Broken ends	3.3.2	(a)
Knots in plied yarn	3.3.2	(a)
Allowance for imperfections	3.4	1
Spooled lengths	3.5.1	1
Spooled ends	3.5.2	1
Identification	3.6	1
Delivery	3.7	1

Note: (a) The entire 100-foot length shall be examined for the specified requirement.

4.9 Acceptance criteria.

4.9.1 Preproduction sample. - The preproduction sample shall conform to all of the requirements as specified and tested herein.

4.9.2 Inspection lot. - Lot acceptance shall conform to the following inspection:

a. All of the requirements verified by the tests of Table II

b. All of the requirements verified by the tests of Table III

c. The characteristics verified by the examinations of Table IV shall not exceed the following limits, as defined in MIL-STD-105:

1. For each requirement, an AQL of 1.5% defects
2. For all requirements, a cumulative AQL of 4.5% defects

5. PREPARATION FOR DELIVERY

5.1 Packaging.

5.1.1 Levels A and C. - The cord, put up on spools (reels), shall be packaged Level A or C (as specified in 6.2) in accordance with the applicable requirements of MIL-C-3131.

5.2 Packing.

5.2.1 Levels A, B, and C. - The cord, packaged in accordance with 5.1.1, shall be packed Level A, B, or C (as specified in 6.2) in accordance with the applicable requirements of MIL-C-3131.

5.3 Marking. - In addition to any special markings required by the contract or order, interior packages and shipping containers shall be marked in accordance with MIL-C-3131.

5.3.1 Spool identification. - Each spool of cord shall have an identifying tag or label which shall be attached in such a manner as to remain in place and be clearly legible until all cord has been removed. All printing shall be legible and water insoluble. The tag shall conform to Fed. Spec. UU-T-81, type B, class 1, size 4 or 5, and shall contain the following information:

Stock number
Nomenclature
Specification number and cord type number
Length
Contract number and date
Date of manufacture (month and year)
Supplier's name

6. NOTES

6.1 Intended use. - Cord of this specification is intended for use in parachutes where the lines have to be telescopically spliced.

6.2 Ordering data. - Procurement documents should specify the following:

a. Title, number, and date of this specification
b. Type of cord required (See Table 1)
c. Color, if required (See 3.2.2.1)
d. Testing activity to perform preproduction tests (See 4.3)
e. Level of packaging desired (See 5.1.1)
f. Level of packing desired (See 5.2.1)
g. Yardage desired per spool; size of spool

6.3 Textile definitions. - Definitions of the textile forms used herein are as follows:

a. Yarn. - The yarn is a number of filaments intertwined to form a continuous strand of a specified denier number.
b. End. - The end is a number of yarns intertwined to form a continuous length of a specified ply number.
c. Carrier. - The carrier is a package or bundle of ends which are handled as a single continuous length by a braiding machine in forming a cord.
d. Cord. - The cord is the end product formed by the intertwining or braiding of a number of carriers in accordance with the specified pattern.

☆ U. S. GOVERNMENT PRINTING OFFICE: 1969-393-092/S-3381

SPECIFICATION ANALYSIS SHEET

Form Approved
Budget Bureau No. 119-R004

INSTRUCTIONS

This sheet is to be filled out by personnel either Government or contractor, involved in the use of the specification in procurement of products for ultimate use by the Department of Defense. This sheet is provided for obtaining information on the use of this specification which will insure that suitable products can be procured with a minimum amount of delay and at the least cost. Comments and the return of this form will be appreciated. Fold on lines on reverse side, staple in corner, and send to preparing activity *(as indicated on reverse hereof)*.

SPECIFICATION

MIL-C-17183B(AS) CORD, NYLON, BRAIDED, TUBULAR, SPLICABLE

ORGANIZATION *(Of submitter)*		CITY AND STATE
CONTRACT NO.	QUANTITY OF ITEMS PROCURED	DOLLAR AMOUNT $

MATERIAL PROCURED UNDER A

☐ DIRECT GOVERNMENT CONTRACT ☐ SUBCONTRACT

1. HAS ANY PART OF THE SPECIFICATION CREATED PROBLEMS OR REQUIRED INTERPRETATION IN PROCUREMENT USE?

A. GIVE PARAGRAPH NUMBER AND WORDING.

B. RECOMMENDATIONS FOR CORRECTING THE DEFICIENCIES.

2. COMMENTS ON ANY SPECIFICATION REQUIREMENT CONSIDERED TOO RIGID

3. IS THE SPECIFICATION RESTRICTIVE?

☐ YES ☐ NO IF "YES", IN WHAT WAY?

4. REMARKS *(Attach any pertinent data which may be of use in improving this specification. If there are additional papers, attach to form and place both in an envelope addressed to preparing activity)*

SUBMITTED BY *(Printed or typed name and activity)*	DATE

DD FORM 1 APR 63 1426

C-8279