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INCH-POUND

MIL-C-5040H
17 March 1994
SUPERSEDING
MIL-C-5040G
30 June 1987

MILITARY SPECIFICATION

CORD, FIBROUS, NYLON

This specification is approved for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers braided nylon cord.

1.2 Classification. The braided cord shall be of the type specified (see table I and 6.2). A part or identifying number for the cord shall be as specified in 6.5 and be applicable to table I.

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation (see 6.2).

SPECIFICATIONS

FEDERAL

UU-T-81 - Tags, Shipping and Stock

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be used in improving this document should be addressed to: U.S. Army Natick, Research, Development, and Engineering Center, Natick, MA 01760-5019, by using the Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A

FSC 4020

DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

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- PPP-B-601 - Boxes, Wood, Cleated-Plywood
 PPP-B-636 - Boxes, Shipping, Fiberboard

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- MIL-C-3131 - Cordage; Packaging of
 MIL-L-35078 - Loads, Unit: Preparation of Semiperishable
 Subsistence Items; Clothing, Personal Equipment
 and Equipment; General Specification for

FEDERAL

- FED-STD-191 - Textile Test Methods
 FED-STD-595 - Colors Used in Government Procurement

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- MIL-STD-105 - Sampling Procedures and Tables for Inspection
 by Attributes
 MIL-STD-129 - Marking for Shipment and Storage
 MIL-STD-147 - Palletized Unit Loads
 MIL-STD-731 - Quality of Wood Members for Containers and
 Pallets
 MIL-STD-905 - Identification, Nylon Cord, Manufacturer's
 Color Code

(Unless otherwise indicated, copies of federal and military specifications, standards, and handbooks are available from the Standardization Documents Order Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.)

2.2 Non-Government publications. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of the documents which are DoD adopted are those listed in the issue of the DODISS cited in the solicitation. Unless otherwise specified, the issues of documents not listed in the DODISS are the issues of the documents cited in the solicitation (see 6.2).

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

- D 3951 - Standard Practice for Commercial Packaging

(Applications for copies should be addressed to the American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103-1187.)

(Non-Government standards and other publications are normally available from the organizations that prepare or distribute the documents. These documents also may be available in or through libraries or other informational services.)

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2.3 Order of precedence. In the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Government and supply purchases. The requirements specified in 3.12 and 3.13 apply only to cord purchased directly by the Government. All other requirements apply to cord purchased by a contractor as a component for an end item and to cord purchased directly by the Government.

3.2 Standard sample. The cord shall match the standard sample for shade and shall be equal to or better than the standard sample with respect to all characteristics for which the standard sample is referenced (see 6.3). When Camouflage Green 483 is specified, the color shall match color chip 34094 of FED-STD-595 (see 3.1.1 and 6.3.2).

3.2.1 First article. When specified (see 6.2), a sample shall be subjected to first article inspection (see 6.3.1) in accordance with 4.1.3.

3.3 Materials. The nylon yarn in the manufacture of the cord shall be a bright, high-tenacity, light-resistant and heat-resistant polyamide prepared from hexamethylenediamine and adipic acid or its derivatives. It shall have a minimum melting point of 244°C when tested as specified in 4.2.1. The plied yarns shall be twisted only from the deniers specified in table I. It is encouraged that recycled material be used when practical as long as it meets the requirements of this specification.

3.4 Processing of yarns.

3.4.1 Core yarns. The core yarns shall be wet shrunk, for a minimum of 60 minutes, at a temperature of $93^{\circ}\text{C} + 3^{\circ}\text{C}$ after which they shall be dried at a temperature not exceeding 93°C before manufacture of the core (see 4.2.2). No oil shall be added to this yarn.

3.4.2 Sleeve yarns. Sleeve yarns shall be wet shrunk for a minimum of 30 minutes at a temperature of $71^{\circ}\text{C} + 3^{\circ}\text{C}$, after which they shall be dried at a temperature not exceeding 71°C before braiding (see 4.2.2). No oil shall be added to this yarn.

3.4.3 Stretching. The yarns used to manufacture the cord shall not be subjected to a stretching operation (see 4.2.2).

3.5 Bleaching. The yarn or the fabricated cord shall not be subjected to any type of bleaching process.

3.6 Construction and physical requirements. The fabricated cord shall conform to the applicable requirements specified in tables I and II and following paragraphs for the respective types when tested as specified in 4.2.1 and 4.2.4.

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TABLE I. Construction

| Dash no. | Type | Yarns denier/ply | Twist (turns/in) spin | Ply | Number of core ends | Picks per in | No. of carriers and ends per carrier |
|----------|-------|------------------|--|------------------------------|---------------------|--------------|--------------------------------------|
| -1 | I | Core | 7.0 to 9.5 | 5 to 7 | 4 to 7 | -- | -- |
| | | Sleeve | 20 to 24.0 | 15 to 19 | -- | 26 to 28 | 32/1 or 16/2 |
| -2 | IA | Core | -- | -- | -- | -- | -- |
| | | Sleeve | 210/3 | 7.0 to 9.5 | 5 to 7 | -- | 26 to 28 |
| -3 | II J | Core | 1 | 1st 10 to 16 FINAL 6 to 8 | 4 to 7 | -- | -- |
| | | Sleeve | 210/3 or 1050 (singles) Final - 3 | 7.0 to (approx) 9.5 | 5 to 7 | -- | 26 to 28 |
| -4 | IIA | Core | -- | -- | -- | -- | -- |
| | | Sleeve | 210/3 | 7.0 to 9.5 | 5 to 7 | -- | 26 to 28 |
| -5 | III J | Core | 1 | 1st 10 to 16 FINAL 6 to 8 | 7 to 9 | -- | -- |
| | | Sleeve | 210/3 or 1050 (singles) Final - 3 | 7.0 to (approx) 9.5 | 5 to 7 | -- | 26 to 28 |

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TABLE I. Construction (cont'd)

| Dash no. | Type | Yarns denier/ply | Twist (turns/in) spin | Ply | Number of core ends | Picks per in | No. of carriers and ends per carrier |
|----------|------------|---|-----------------------|------------------------------|---------------------|--------------|--------------------------------------|
| -6 | IV \perp | Core 210/1st 5 or 1050 (singles) Final - 3 | -- | 1st 10 to 16 FINAL 6 to 8 | 11 | -- | -- |
| | | Sleeve 210/3 | 7.0 to 9.5 | 5 to 7 | -- | 26 to 28 | 32/1, 36/1, or 44/1 |

\perp The core yarn shall be constructed by plying five yarns of 210 denier, resulting in a 1050 denier yarn, for the initial spin, or by using 1050 denier singles yarn, then plying three of the 1050 yarns (either 5 ply or singles) together, resulting in a final core size of 3150 denier.

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TABLE II. Physical requirements

| | Type I | Type IA | Type II | Type IIA | Type III | Type IV |
|--|-----------|------------|------------|-------------|-------------|------------|
| Breaking strength (pounds), minimum | 95 | 100 | 400 | 225 | 550 | 750 |
| Elongation (percent), minimum | 30 | 30 | 30 | 30 | 30 | 30 |
| Length per pound of cord (feet), minimum | 950 | 1050 | 265 | 495 | 225 | 165 |

3.6.1 Lapping of the core ends. Lapping of the core ends, or a sewn overlap where two core yarns are held together by the wrapping of thread around them is permissible providing the overlap is more than 5 inches but does not exceed 10 inches in length. Splicing or knotting of the core lines is not permissible (see 6.4). The minimum distance between a core end overlap or any adjacent core end overlap shall be 100 feet. The approximate center of each overlap shall be marked by inserting a bright red thread through the sleeve. The free ends of the marker shall extend approximately 3 inches on either side of the sleeve. The removal of the marker shall be accomplished by a light pull on either end. When Camouflage Green 483 colored cord is specified, the color of the marker shall be white.

3.6.1.1 Protruding core ends. When any core end projects through the sleeve as a result of overlapping (see 3.6.1 and 6.4), the end(s) shall be out flush with the surface of the sleeve with the cord in a relaxed condition. CAUTION: Do not hot knife the end(s) and be extremely careful not to damage the sleeve.

3.6.2 Extractable matter (chloroform-soluble material). No material shall be added for the purpose of weighing the cord. The chloroform-soluble material of the cord shall not exceed 2.0 percent when tested as specified in 4.2.4.

3.7 Resistance to light and heat. The nylon cord shall lose not more than 15 percent of its original breaking strength after exposure to light and heat when tested as specified in 4.2.4.

3.8 Color. Unless otherwise specified (see 6.2), the color of the cord shall be natural. When colored cord is specified, the color shall be obtained by yarn dyeing, and the cord shall match an approved standard shade of Camouflage Green 483 (see 6.3).

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3.8.1 Color (shade) matching. The dyed cord shall match the standard sample when viewed under filtered tungsten lamps that approximate artificial daylight and that have a correlated color temperature of $7500\text{ K} \pm 200\text{ K}$, with illumination of $100\text{ foot candles} \pm 20\text{ foot candles}$, and shall be a good match to the standard sample under incandescent lamplight at $2300\text{ K} \pm 200\text{ K}$.

3.8.2 Colorfastness. The dyed cord shall show fastness to light, laundering, and dry cleaning equal to or better than the standard sample or shall show good fastness to light, laundering, and dry cleaning when tested as specified in 4.2.4.

3.9 Manufacturer's identification. Manufacturer's identification yarns (color-codes) shall be dyed yarns of the assigned colors designated in MIL-SID-905 and shall have the same colorfastness properties as described in 3.8.2.

3.9.1 Types I, II, III, and IV cord. Each manufacturer shall include in the cores of types I, II, III, and IV cord dyed yarns of the assigned colors that will identify his product. The color identification yarns shall be incorporated into a single core end. If a manufacturer's color code consists of three different colors, one core end shall contain all three of these colors, one color per ply.

3.9.2 Type IA and type IIA cord. Each manufacturer shall include, in the sleeve of type IA and type IIA cord, yarns of the assigned colors that will identify his product.

3.10 Type identification. Type II cord shall be identified by one black yarn braided into the sleeve (or cover). The colored marker yarns shall be 210 denier, 3 ply.

3.11 Age. The yarn used to fabricate the cord shall be no more than two years old on date of delivery of goods to the first receiving point. The cord shall be no more than one year of age from the date of manufacture to the date of delivery to the first receiving point.

3.12 Put-up and length. Unless otherwise specified (see 6.2), the cord shall be put-up on nonreturnable reels/spools in lengths specified in table III. Each reel/spool shall not contain any knots or splices and shall be so wound that each turn and layer is free from entanglement. A plus tolerance of 10 percent shall be allowed on the total length of any reel/spool. The ends of the cord shall be heat sealed to prevent fraying. When the cord is put-up in 1200 foot or 1500 foot lengths, 80 percent of the total number of reels/spools in the lot shall be in one continuous length. The remaining 20 percent in the lot may contain pieced lengths (lapped on ends). These reels/spools shall contain no more than two pieces, with no piece less than 300 feet in length. When the cord is put-up on 2100 foot reels/spools, 80 percent of these reels/spools shall contain no more than two pieces, with

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no piece less than 300 feet in length. The remaining 20 percent in the lot shall contain no more than three pieces less than 300 feet. When pieced lengths are contained on a reel/spool, the number and lengths of the pieces shall be marked on the identification ticket or label as specified in 3.13.

TABLE III. Length

| Type | Length on reels/spools (feet), minimum |
|------|---|
| I | 1500 |
| IA | 1500 |
| II | 2100 or 1200 |
| IIA | 2100 or 1200 |
| III | 2100 or 1200 |
| IV | 1500 |

3.13 Identification. Each spool (reel) or cord shall have a ticket (identification tag) or label attached to it for identification purposes. The ticket shall conform to the requirements for type B, size 4 or 5 of UU-T-81. The ticket shall be made of not less than 15-point paper stock and shall have a minimum tearing resistance of both directions (total) or 850 grams when tested as specified in UU-T-81. When labels are used, the label shall be attached in such a manner as to remain in place and be legible until all cord has been removed. The ticket or label shall be legibly printed, stamped, or typed with water insoluble ink. The ticket or label shall contain the following information:

- Stock number
- Item description
- Specification number
- Length
- Number and length of pieces (when applicable)
- Color
- Contract number and date
- Date of manufacture (month and year)
- Length of pieces of cord per spool (when applicable)
- Contractor's name
- Bar code

3.14 Workmanship. The end item shall conform to the quality of product established by this specification and the occurrence of defects shall not exceed the applicable acceptable quality levels.

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4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all inspection requirements (examinations and tests) as specified herein. Except as otherwise specified in the contract or purchase order, the contractor 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 this specification where such inspections are deemed necessary to ensure supplies and services conform to prescribed requirements.

4.1.1 Responsibility for compliance. All items shall meet all requirements of sections 3 and 5. The inspection set forth in this specification shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in the specification shall not relieve the contractor of the responsibility of ensuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling inspection, as part of manufacturing operations, is an acceptable practice to ascertain conformance to requirements; however, this does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to accept defective material.

4.1.2 Certificates of compliance. When certificates of compliance are submitted (see table IV), the Government reserves the right to inspect such items to determine the validity of the certification.

4.1.3 First article inspection. When a first article is required (see 3.1 and 6.2), it shall be examined for the defects specified in 4.2.3.1, 4.2.3.2, 4.2.3.3, 4.2.3.3.1, 4.2.3.3.2 and tested for the characteristics specified in 4.2.4. The presence of any defect shall be cause for rejection of the first article.

4.2 Quality conformance inspection. Unless otherwise specified, sampling for inspection shall be performed in accordance with MIL-STD-105.

4.2.1 Component and material inspection. In accordance with 4.1, components and materials shall be inspected in accordance with all the requirements of referenced documents unless otherwise excluded, amended, modified, or qualified in this specification or applicable purchase document. In addition, inspection shall be performed for the requirements in table IV.

TABLE IV. Component tests

| Characteristic | Requirement paragraph | Test method |
|----------------|-----------------------|-------------|
| Denier | 3.3 | 1/ |
| Tenacity | 3.3 | 1/ |

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TABLE IV. Component tests (cont'd)

| Characteristic | Requirement paragraph | Test method |
|----------------------|-----------------------|------------------------------------|
| Melting point | 3.3 | 1534 <u>1/</u> <u>2/</u> |
| Bleaching | 3.5 | <u>1/</u> |
| Age of yarn and cord | 3.11 | <u>1/</u> |
| Twist, single yarns | Table I | 4052 <u>1/</u> <u>2/</u> <u>3/</u> |
| Twist, plied yarns | Table I | 4054 <u>1/</u> <u>2/</u> <u>3/</u> |
| Plying of core yarns | Table I | <u>1/</u> |

1/ Unless otherwise specified, a contractor's certificate of compliance shall be furnished and will be accepted for the requirements.

2/ Refers to test method of FED-STD-191.

3/ Twist of yarns: The number of specimens averaged for the result shall be five determinations on the core yarns and 10 determinations on the sleeve yarns, and the dead weight tension applied to the specimens shall be 60 grams \pm 2.0 grams. The 10 determinations of the sleeve yarn twist shall be made on specimens so selected that observations shall be made on five yarns braiding in one direction and five yarns braiding in the opposite direction. Turns per inch of the singles and first ply yarns shall be determined from the same specimen used for the determination of ply twist by cutting out all but one of the strands, leaving the plied ends still fastened in the clamps, and setting the counter to the zero mark.

4.2.2 In-process inspection. Inspection shall be made at any point or during any phase of the manufacturing process to determine that the requirements for processing of the core and sleeve yarns for shrinkage and stretching, lapping of the core yarn (see 3.4.1, 3.4.2, 3.4.3, and 3.6.1), and for percentages of allowable number of pieced lengths per spool or reel in the lot (see 3.12) have been adhered to in the manufacture of the cord. Unless otherwise specified, a contractor's certificate of compliance shall be furnished and will be accepted for these requirements. The Government reserves the right to exclude from consideration for acceptance any material or service for which in-process inspection has indicated nonconformance.

4.2.3 End item inspection.

4.2.3.1 Critical defect examination of the end item. Prior to performing the end item sampling required in 4.2.3.2, the cord spools (reels) shall be 100 percent examined for the critical defects in table V. This 100 percent

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critical defect examination shall become a part of the contractor's inspection system or quality program. Any spool (reel) found to contain a critical defect shall be rejected.

4.2.3.2 End item visual examination. The defects specified in table V shall be counted, regardless of their proximity to each other, except where two or more defects represent a single local condition, in which case only the more serious defect shall be counted. The lot size shall be expressed in units of spools (reels), as applicable. The sample unit for the examination shall be one spool (reel). The inspection level shall be III and the finding of any defect shall be cause for rejection of the lot. Ten percent of the length contained on each sample unit, but not less than 100 feet, shall be subjected to the visual examination.

TABLE V. End item visual defects

| Examine | Defect | Classification | | |
|----------------------------|--|-----------------|--------------|--------------|
| | | <u>Critical</u> | <u>Major</u> | <u>Minor</u> |
| Appearance and workmanship | Any cut or hole | 01 | | |
| | Abrasion, chafed area, or distortion in the orientation of yarn | 02 | | |
| | Kink or unevenly braided, resulting open place, break in continuity of braid, or soft spot | 03 | | |
| | Float, broken or missing end, or pick | 04 | | |
| | Any projecting core end | 05 | | |
| | Missing core end | 06 | | |
| | Typed identification missing (when applicable) | 07 | | |
| | Manufacturer's identification missing | | 101 | |
| Type | Other than specified | | 102 | |
| Color | Other than specified | | 103 | |
| | Not within established tolerances | | | 201 |
| Put-up | Other than specified (i.e., spools (reels) not made of wood or metal) | | 104 | |
| Cleanness | Spot or stain clearly visible $\frac{1}{2}$ | | | 202 |
| | Objectionable odor | | | 203 |

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TABLE V. End item visual defects (cont'd)

| Examine | Defect | Classification | | |
|---|--|-----------------|--------------|--------------|
| | | <u>Critical</u> | <u>Major</u> | <u>Minor</u> |
| Identification | Omitted | | 105 | |
| | Information incorrect, illegible | | | 204 |
| | Ticket or label not as specified | | | 205 |
| Coarse or heavy end (per 20 linear yards) | Over one end, 2 yards or more in length | | 106 | |
| | Over two ends | | 107 | |
| | Two ends, over 1 yard long | | 108 | |
| | One end, up to 2 yards long | | | 206 |
| | Two ends, up to 1 yard long | | | 207 |
| Heavy, thick, or hard pieces or uneven picks | Picks per inch: | | | |
| | - 31 or more | | 109 | |
| | - 29 or more for over 2 inches | | 110 | |
| | - 29 or 30 for up to 2 inches | | | 208 |
| Knots in plied yarn (per 10 linear yards) | Over one knot in sleeve yarns | | 111 | |
| | Any knot or splice in core | 08 | | |
| | One knot in sleeve yarns | | | 209 |
| Light place, pull down, step marks, or uneven picks | Picks per inch: | | | |
| | - 23 or less | | 112 | |
| | - 25 or less for over 2 inches | | 113 | |
| | - 24 or 25 for up to 2 inches | | | 210 |
| Tight ends (per 10 linear yards) | Over one end, 2 yards or more in length | | 114 | |
| | Two or more ends, less than 2 yards long | | | 211 |

1/ At normal inspection distance (approximately 3 feet).

4.2.3.3 Examination for length and winding. The sample unit for this examination shall be one spool (reel). The inspection level shall be S-3 and the finding of any defect shall be cause for rejection of the lot. For lots consisting of 500 or fewer units, the sample size shall be 10 and the acceptance number 1. The lot size shall be the number of spools (reels) in the lot. Defects shall be as listed in 4.2.3.3.1 and 4.2.3.3.2. The length on the spool (reel) (see table III) shall be determined using the following formula:

$$W \times L = \text{Length per spool (reel) in feet,}$$

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where W = the net weight of the spool (reel) in 0.1 pound
 L = the lot average of the weight/length relationship
(length/pound) as determined in 4.2.4.

The length on the spool (reel) may also be determined by measuring yardage on the spool (reel).

4.2.3.3.1 Defects with regard to length. Defects shall be considered to exist if any of the following are determined during inspection:

- a. The length of cord on spool (reel) is less than specified or more than 10 percent in excess of the length specified.
- b. Length of cord on spool (reel) is more than 6 feet less than length marked on ticket or label.

4.2.3.3.2 Defects with regard to winding. Defects shall be considered to exist if any of the following conditions are determined during inspection:

- a. Improperly or not firmly wound, resulting in kinking, knotting, entangling, or slippage during unwinding or otherwise affecting free unhampered unwinding of cord.
- b. Put-up not as specified.
- c. Any end not heat sealed.
- d. Knot or otherwise joining of ends to make a continuous length.
- e. Any core end lap less than 100 feet apart (when applicable).
- f. Any spool (reel) of cord found to contain more pieced lengths than specified.
- g. Any piece of cord less than 300 feet in length.
- h. The lengths of the pieces not marked on the identification ticket or label.

4.2.4 End item testing. The methods of testing specified in FED-STD-191, wherever applicable and as listed in table VI, shall be followed. When the data in the "Number of determinations" and "Results reported as" columns are not specified in the table, they shall be as required by the referenced test method. The physical and chemical values specified in section 3 apply to the average of the determinations made on a sample unit for test purposes as specified in the applicable test methods. The lot size shall be expressed in units of spools (reels) of cord, as applicable. The sample unit shall be one spool (reel). The inspection level shall be S-3 and the finding of any defect shall be cause for rejection of the lot. All test reports shall contain the individual values utilized in expressing the final results. Tests to determine compliance with document requirements, may be made under prevailing atmospheric conditions. In cases of dispute, tests shall be made upon material that has reached equilibrium under standard conditions as defined in FED-STD-191.

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TABLE VI. End item tests

| Characteristics | Requirement reference | Test method | No. of determinations per individual sample unit | Results reported as |
|--|-----------------------|-----------------|--|--|
| Construction: | | | | |
| Number of core ends | Table I | Visual | 3 | Avg of 3 determinations to nearest whole no. |
| Picks per inch | Table I | 4.3.1 | 1 | To nearest whole no. |
| Number of carriers | Table I | Visual | 3 | Avg of 3 determinations to nearest whole no. |
| Number of ends per carrier | Table I | Visual | 3 | Avg of 3 determinations to nearest whole no. |
| Ply | Table I | Visual | 3 | Avg of 3 determinations to nearest whole no. |
| Length per pound | Table II | 6004 | - | - |
| Breaking strength | Table II | 6016 | - | - |
| Elongation | Table II | 6016 <u>1</u> / | - | - |
| Extractable matter (chloroform-soluble material) | 3.6.2 | 2611 | - | - |
| Resistance to light | 3.7 | 4.3.2 | - | - |
| Resistance to heat | 3.7 | 4.3.2 | - | - |

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TABLE VI. End item tests (cont'd)

| Characteristics | Requirement reference | Test method | No. of determinations per individual sample unit | Results reported as |
|-----------------|-----------------------|-------------|--|---------------------|
| Colorfastness: | | | | |
| To light | 3.8.2 | 5660 2/ | 1 | Pass or fail |
| To laundering | 3.8.2 | 5614 3/ 4/ | 1 | Pass or fail |
| To dry cleaning | 3.8.2 | 5620 4/ | 1 | Pass or fail |

- 1/ Except that elongation shall be determined at the breaking point.
- 2/ The exposure shall be 20 standard fading hours.
- 3/ This test shall be applied to the dyed identification yarns which are part of the core yarns of the cored types of this specification or are a part of the sleeve yarns in the coreless type of cord. On the cored types of cord, the sleeve shall be removed, and a 4 to 5 gram test specimen of the core yarns containing the dyed yarns, together with the marker yarns, shall be gathered together and tied into a bundle with a single overhand knot. For the coreless type, the specimen shall consist of the sleeve containing the marker threads.
- 4/ Test on dyed cord: The test specimen shall be 4 to 5 grams of cord.

4.2.5 Packaging inspection. Inspection shall be made in accordance with the quality assurance provisions of MIL-C-3131 except that the inspection level shall be S-2 and the finding of any defect shall be cause for rejection of the lot.

4.2.6 Palletization examination. The fully packaged and palletized end items shall be examined for the defects listed below. The lot size shall be expressed in units of palletized unit loads. The sample unit shall be one palletized unit load, fully packaged. The inspection level shall be S-1 and the finding of any defect shall be cause for rejection of the lot.

| <u>Examine</u> | <u>Defect</u> |
|---------------------|--|
| Finished dimensions | Length, width, or height exceeds specified maximum requirement |
| Palletization | Pallet pattern not as specified Interlocking of loads not as specified Load not bonded with required straps as specified |
| Weight | Exceeds maximum load limits |

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Marking Omitted; incorrect; illegible; of improper size, location, sequence, or method of application

4.3 Methods of inspection.

4.3.1 Determination of picks per inch. Picks per inch shall be counted visually with the cord so positioned that the repeat of the stitch pattern creates a straight line parallel to the axis of the cord.

4.3.2 Determination of resistance to light. Five test specimens shall be taken from each sample unit. The test specimens shall be expressed in the accelerated weathering unit as specified in method 5804 of FED-STD-191. The specimens shall be placed side by side on the rack in such a manner that only the center 10 inches to 18 inches of each specimen is exposed without being shielded by the rack. Unbacked specimens shall be exposed either mounted in stainless steel frames or as a large piece suspended from the outside rim of the exposure rack. Corex D filters and sunshine carbons shall be used. The exposure time shall be fifty hours. The spray heads shall be shut off during the entire exposure period and the relative humidity in the test chamber during the exposure shall be 55 percent \pm 5 percent. The drain pan shall contain from 1/2 inch to 1 inch of water during the exposure process. At the end of the exposure period, the specimens shall be conditioned at 70°F \pm 2°F and 65 percent \pm 2 percent relative humidity for twenty-four hours. The specimens shall then be tested for breaking strength (BS) in accordance with method 6016 of FED-STD-191, and the percent of BS lost shall be calculated as follows:

$$\text{Percent of BS lost} = \frac{\text{Original BS} - \text{BS after exposure}}{\text{Original BS}} \times 100$$

4.3.3 Determination of resistance to heat. Five test specimens shall be taken from each sample unit. The test specimens shall be suspended in a circulating air oven at a temperature of 356°F \pm 5° for one hour. After removal from the oven, the specimens shall be conditioned at 70°F \pm 2°F and 65 percent \pm 2 percent relative humidity for 24 hours. The specimens shall then be tested for BS in accordance with method 6016 of FED-STD-191, and the percent BS lost shall be calculated as specified in 4.3.2.

5. PACKAGING

5.1 Preservation. Preservation shall be level A or Commercial, as specified (see 6.2).

5.1.1 Level A. Spools (reels) or cord, put-up as specified, shall be preserved in accordance with the applicable requirements of MIL-C-3131.

5.1.2 Commercial. Spools (reels) of cord shall be preserved in accordance with ASTM D 3951.

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5.2 Packing. Packing shall be level A, B, or Commercial, as specified (see 6.2).

5.2.1 Levels A and B packing. Spools (reels) of cord shall be packed in accordance with the applicable requirements of MIL-C-3131 except that for level A the shipping container shall conform to style RSC, grade V2s of FFP-B-636 or to overseas type, style A or I, grade A or B, type 2 load of FFP-B-601, as specified (see 6.2). For level A packing, fiberboard shipping containers shall be arranged in unit loads in accordance with MIL-L-35078 for the type and class of load specified (see 6.2). Strapping shall be limited to nonmetallic strapping, except for type II, class F loads.

5.2.2 Commercial packing. Spools (reels) or cord, preserved as specified in 5.1, shall be packed in accordance with ASTM D 3951.

5.3 Palletization. When specified (see 6.2, cord, packed in fiberboard shipping containers as specified in 5.2.1 and 5.2.2, shall be palletized on a four-way entry pallet in accordance with load type Ia of MIL-STD-147. Pallet type shall be type I (four-way entry), type IV or type V in accordance with MIL-STD-147. Pallets shall be fabricated from wood groups I, II, III, or IV of MIL-STD-731. Each prepared load shall be bonded with primary and secondary straps in accordance with bonding means C and D or film bonding means F or G. Pallet pattern shall be in accordance with appendix of MIL-STD-147. Interlocking of loads shall be affected by reversing the pattern of each course.

5.4 Marking. In addition to any special marking required by the contract or purchase order, interior unit packs, exterior shipping containers, spools (reels), and palletized unit loads shall be marked in accordance with MIL-STD-129 or ASTM D 3951, as applicable.

6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

6.1 Intended use. The cord is intended for use as personnel parachute suspension lines and is also used with various equiPAGE items.

6.2 Acquisition requirements. Acquisition documents must specify the following:

- a. Title, number, and date of this specification.
- b. Issue of DODISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.1.1 and 2.2).
- c. Part number, type required (see table I).
- d. When shade Camouflage Green 483 is required (see 3.8).
- e. Put-up if other than specified (see 3.12).

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- f. Selection of applicable levels of preservation and packing (see 5.1 and 5.2).
- g. Type of shipping container desired for level A packing (see 5.2.1).
- h. Type and class of unit load required for level A packing (see 5.2.1).
- i. When palletization is required (see 5.3).
- j. When a first article is required (see 3.2.1, 4.1.3, and 6.3.1).

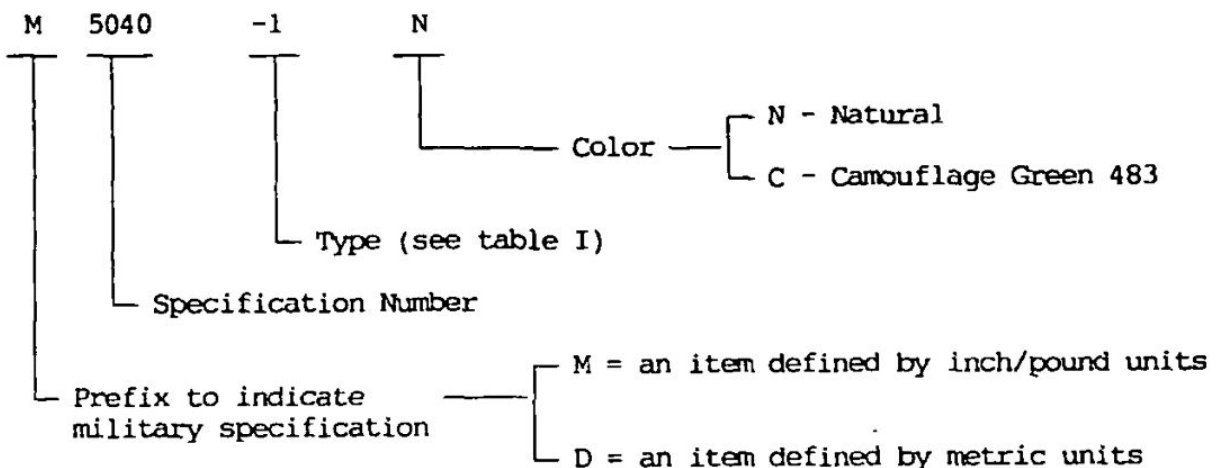
6.3 Standard sample. For access to samples, address the contracting activity issuing the invitation for bids.

6.3.1 First article. When a first article is required, it shall be inspected and approved under the appropriate provisions of FAR 52.209-4. The first article should be a preproduction sample. The contracting officer should specify the appropriate type of first article and the number of units to be furnished. The contracting officer should also include specific instructions in acquisition documents regarding arrangement for selection, inspection, and approval of the first article.

6.3.2 Color. Olive Drab 7 has been replaced by Camouflage Green 483. Any end item which previously required Olive Drab 7 shall use Camouflage Green 483.

6.4 Splicing and lapping. Splicing as used in this specification is defined as the joining of two strands or core ends by process of interweaving or mechanical joint. Lapping of core ends as used in this specification is defined as the insertion of an incoming core line running parallel to a running-out core line without splicing (i.e., to lie upon and extend between two given points).

6.5 Part or identifying number (PIN). The PIN to be used for nylon cord acquired to this specification are created as follows:



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6.6 Subject term (key word) listing.

Cord, nylon
Equipage
Parachute lines

6.7 Changes from previous issue. Marginal notations are not used in this revision to identify changes with respect to the previous issue due to the extensiveness of the changes.

Custodians:

Army - GL
Navy - AS
Air Force - 99

Preparing activity:

Army - GL
(Project 4020-0342)

Review Activities:

Navy - SH
Air Force - 82
DLA - IS
DNA - DS

User Activity:

Navy - MC

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

INSTRUCTIONS

1. The preparing activity must complete blocks 1, 2, 3, and 8. In block 1, both the document number and revision letter should be given.
2. The submitter of this form must complete blocks 4, 5, 6, and 7.
3. The preparing activity must provide a reply within 30 days from receipt of the form.

NOTE: This form may not be used to request copies of documents, nor to request waivers, or clarification of requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requirements.

| | | |
|------------------------|-----------------------------------|--|
| 1. RECOMMEND A CHANGE: | 1. DOCUMENT NUMBER MIL-C-50408 | 2. DOCUMENT DATE (YYMMDD) 1994 March 17 |
|------------------------|-----------------------------------|--|

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|---|
| 3. DOCUMENT TITLE CORD, FERROUS, NYLON |
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|---|
| 4. NATURE OF CHANGE (Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.) |
|---|



Phone: (401) 762-5500

Email: ACWCO@acw1.com

| | | |
|------------------------------|--|--|
| 5. REASON FOR RECOMMENDATION | | |
|------------------------------|--|--|

| | | |
|---------------------------------------|---|----------------------------|
| 6. SUBMITTER | | |
| a. NAME (Last, First, Middle Initial) | b. ORGANIZATION | |
| c. ADDRESS (include Zip Code) | d. TELEPHONE (include Area Code) (1) Commercial (2) AUTOVON (if applicable) | 7. DATE SUBMITTED (YYMMDD) |

| | | |
|--|--|-----------------------------|
| 8. PREPARING ACTIVITY | | |
| a. NAME U.S. Army Natick RDE&C Center | b. TELEPHONE (include Area Code) (1) Commercial 508-651-4532 | (2) AUTOVON/DSN 256-4532 |
| c. ADDRESS (include Zip Code) Commander, U.S. Army Natick RDE&C Center ATTN: SATMC-1R Natick, MA 01760-5019 | IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT: Defense Quality and Standardization Office 1203 Leesburg Pike, Suite 1402, Falls Church, VA 22041-3466 Telephone (703) 756-2340 AUTOVON 289-2340 | |