MIL-C-43128C
10 September 1986
SUPERSEDING
MIL-C-43128B
17 February 1970

MILITARY SPECIFICATION

CLOTH, PLAIN WEAVE, NYLON. WATER REPELLENT, OG-106

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

1. SCOPE

1.1 Scope. This document covers one type of nylon cloth.

2. APPLICABLE DOCUMENTS

2.1 Government documents.

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

SPECIFICATIONS

FEDERAL

V-T-285	- Thread, Polyester
PPP-P-1133	- Packaging of Synthetic Fiber Fabrics

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to U.S. Army Natick Research, Development, and Engineering Center, Natick, MA 01760-5014, by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A FSC 8305

STANDARDS

FEDERAL

FED-STD-4	- Glossary of Fabric Imperfections
FED-STD-191	- Textile Test Methods

MILITARY

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

(Copies of documents required by contractors in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting activity.)

* 2.1.2 Other Government documents. The following other Government documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues shall be those in effect on the date of the solicitation.

Rules and Regulations Under the Textile Fiber Products Identification Act

(Application for copies should be addressed to the Federal Trade Commission, Washington, DC 20580.)

* 2.2 Order of precedence. In the event of conflict between the text of this document and the references cited herein, the text of this document shall take precedence. Nothing in this document, however, shall supersede applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

* 3.1 Standard sample. The finished cloth shall match the standard sample for shade and appearance 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).

* 3.2 First article. When specified in the contract or purchase order, a sample shall be subjected to first article inspection (see 4.3, 6.2, and 6.4).

3.3 Material.

3.3.1 Fiber. The fiber shall be bright filament nylon.

3.3.2 Yarn. The yarn shall be multifilament.

3.4 Color. The color of the dyed and finished cloth shall be Olive Green 106 and shall match the standard sample (see 6.5).

* 3.4.1 Matching. The color and appearance of the dyed and finished cloth shall match the standard sample when viewed under filtered tungsten lamps that approximate artificial daylight and that have a correlated color of 7000 ±500K with illumination of 100 ± 20 foot candles. The color shall be a good match to the standard sample under incandescent lamplight at 2300 ±100K.

3.4.2 Colorfastness. The dyed and finished cloth shall show fastness to weathering and laundering equal to or better than the standard sample or equal to or better than the rating of "good" when tested as specified in 4.4.3.

3.5 Physical requirements. The finished cloth shall conform to the requirements specified in table I when tested as specified in 4.4.3.

TABLE I. Physical requirements

Weight per sq yd, ounces		Yarns per inch, minimum		Breaking strength, pounds, minimum		Stiffness load, lb, maximum	
Minimum	Maximum	Warp	Filling	Warp	Filling	Warp	Filling
3.8	4.8	80	56	275	225	0.005	0.004

* 3.5.1 Width. The width of the cloth shall be as specified (see 6.2) and shall be the minimum acceptable width inclusive of the selvage when fly shuttle looms or shuttleless with tuck-in selvage looms are used. For all other shuttleless looms, the width measurement shall be made between the last warp yarn on each side excluding the protruding fringe(s).

3.5.2 Weave. The cloth shall be constructed as a plain weave.

3.6 Finish. The cloth shall be scoured, heat treated, and calendered so as to meet the requirements of this document.

3.6.1 Nonfibrous material. Prior to the application of the water repellent treatment, the cloth shall contain not more than a total of 2.0 percent chloroform-soluble and water-soluble material when tested as specified in 4.4.3.

3.6.2 Water repellency. The cloth shall be given a water repellent treatment. The water repellent shall consist of aluminum salts of saturated carboxylic acids (such as formate, acetate, palmitate, or stearate), zirconium salts of such saturated carboxylic acids, or a combination of both, mixed with refined mineral and vegetable waxes, titanate esters, or a combination of both. The product shall be applied either in the form of an aqueous emulsion or in the form of a water free solvent solution to effect the deposit of not more than 6.0 percent on the weight of the finished cloth. The finished cloth shall conform to the water repellency requirements of 3.6.2.1.

3.6.2.1 Spray rating. The results of the three individual determinations on the sample unit for spray rating shall be equal to or better than ratings 90, 90, 80, when tested as specified in 4.4.3.

3.6.3 Air permeability. The finished cloth shall have a maximum air permeability of 2.0 cubic feet per minute per square foot of cloth when tested as specified in 4.4.3.

3.6.4 pH. The pH value of the water extract of the finished cloth shall be no less than 5.0 nor more than 8.5 when tested as specified in 4.4.3.

* 3.6.5 Dimensional stability. The finished cloth shall not shrink or elongate more than 3.0 percent in the warp nor more than 2.0 percent in the filling when tested as specified in 4.4.3.

* 3.6.6 Seam efficiency. The finished cloth shall have a minimum seam efficiency of 85 percent when tested as specified in 4.4.3.

3.7 Length and put-up. Unless otherwise specified (see 6.2), the cloth shall be furnished in continuous lengths, each not less than 40 yards. The cloth shall be put up in full-width rolls as specified in 5.1.

3.8 Fiber identification. Each roll of cloth shall be labeled, ticketed or invoiced for fiber content in accordance with the Textile Fiber Products Identification Act.

3.9 Workmanship. The finished cloth shall conform to the quality established by this document. The demerit points per 100 square yards, when calculated as specified in section 4, shall not exceed the established maximum point value.

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 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 document where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

* 4.1.1 Responsibility for compliance. All items must meet all requirements of sections 3 and 5. The inspection set forth in this document shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirement in the document shall not relieve the contractor of the responsibility of assuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling in quality conformance does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to acceptance of defective material.

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

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

a. First article inspection (see 4.3).
b. Quality conformance inspection (see 4.4).

* 4.3 First article inspection. When a first article is required (see 6.2), it shall be examined for appearance, color, and finish defects and shall be tested for the characteristics specified in table II. The presence of any defect or failure of any test shall be cause for rejection of the first article.

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

4.4.1 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 document or applicable purchase document.

4.4.2 End item examination.

4.4.2.1 Yard-by-yard examination. Each roll in the sample shall be examined on the face side only. When the total yardage in the roll does not exceed 100 yards, the entire yardage in the roll shall be examined. When the total yardage in the roll exceeds 100 yards, only 100 yards shall be examined. All defects as defined in Section III of FED-STD-4, which are clearly noticeable at normal inspection distance (3 feet) shall be scored and assigned demerit points as listed in 4.4.2.1.1. No linear yard (increments of 1 yard on the measuring device of the inspection machine) from any one roll within the sample shall be penalized more than four points. The sample size shall be 20 rolls selected from 20 containers. The lot shall be unacceptable if the points per 100 square yards of the total yardage examined exceeds 40.0 points. The lot shall be unacceptable if the points per 100 square yards of two or more individual rolls exceed 60.0 points. If one roll exceeds 60.0 points per 100 square yards, a second sample of 20 rolls shall be examined for individual roll quality only. The lot shall be unacceptable if one or more rolls in the second sample exceed 60.0 points per 100 square yards. Point computation for lot quality and individual roll quality shall be as follows:

$$\frac{\text{Total points scored in sample} \times 3600}{\text{Contracted width of cloth (inches)} \times \text{Total yards inspected}} = \text{Points per square yards}$$

4.4.2.1.1 Demerit points. Demerit points shall be assigned as follows:

For defects 3 inches or less in any dimension	- one point
For defects exceeding 3 inches but not exceeding 6 inches in any dimension	- two points
For defects exceeding 6 inches but not exceeding 9 inches in any dimension	- three points
For defects exceeding 9 inches in any dimension	- four points

The following defects, when present, shall be scored four points for each yard in which they occur:

Baggy, ridgy, or wavy cloth
Objectionable odor
Width less than specified
Poor dye penetration, mottled, streaky, or cloudy
Overall uncleanliness

* 4.4.2.2 Length examination. During the yard-by-yard examination, each roll in the sample shall be examined for length. Any length found to be less than the minimum specified or more than 2 yards less than the length marked on the ticket shall be considered a defect with respect to length. The lot shall be unacceptable if two or more rolls in the sample are defective with respect to length or if the total of the actual lengths of rolls in the sample is less than the total of the lengths marked on the tickets.

* 4.4.2.3 Shade and appearance examination. During the yard-by-yard examination, each roll in the sample shall be examined for shade and finish appearance. Any roll in the sample off shade, shaded side to side, side to center, or shaded end to end, or any roll that does not have the same appearance as the standard sample, shall be cause for rejection of the entire lot represented by the sample.

4.4.2.4 Roll identification examination. During the yard-by-yard examination, each roll in the sample shall be examined for conformance to the Rules and Regulations Under the Textile Fiber Products Identification Act. Each roll not labeled in accordance with this act shall be a defect. The lot shall be unacceptable if two or more of these defects occur.

* 4.4.3 End item testing. The cloth shall be tested for the characteristics listed in table II. The methods of testing specified in FED-STD-191, wherever applicable, and as listed in table II shall be followed. The physical and chemical values specified in section 3, except where otherwise specified, apply to the average of the determinations made on the sample unit for test purposes as specified in the applicable test method. The sample unit shall be 1/4 yard full width of the cloth prior to the water repellent treatment for determination of the nonfibrous materials content and 5 continuous yards full width of the finished cloth for all physical and remaining chemical tests. All test reports shall contain the individual values utilized in expressing the final results. The lot size shall be expressed in units of 1 yard. The lot shall be unacceptable if one or more sample units fail to meet any test requirement specified. The sample size shall be in accordance with the following:

Lot size (yards)	Sample size (sample units)
800 or less	2
801 up to and including 22,000	3
22,001 and over	5

TABLE II. End item tests

Characteristic	Requirement paragraph	Test method
Fiber identification	3.3.1	1/
Multifilament yarn	3.3.2	1/
Colorfastness to:		
Weathering	3.4.2	5671 2/
Laundering	3.4.2	5614
Weight	3.5	5041
Yarns per inch	3.5	5050
Breaking strength	3.5	5100
Stiffness	3.5	5202
Weave	3.5.2	Visual 3/
Nonfibrous materials	3.6.1	2611
Water repellency:		
Water repellent material and add on	3.6.2	1/
Spray rating	3.6.2.1	5526
Air permeability	3.6.3	5450
pH	3.6.4	2811
Dimensional stability	3.6.5	4.5.1
Seam efficiency	3.6.6	5110 4/

1/ Unless otherwise specified, a certificate of compliance shall be submitted and will be acceptable for the stated requirements.

2/ The time of exposure shall be 80 hours.

3/ One determination per sample unit and the results reported as "pass" or "fail".

4/ The needle shall measure 0.049 ± 0.001 inch across the blade at the eye. The thread shall be polyester conforming to type I, class 1, subclass A or B of V-T-285, with size F for the needle and size E for the looper.

4.4.4 Packaging inspection. The inspection shall be in accordance with the quality assurance provisions of PPP-P-1133.

4.5 Methods of inspection.

4.5.1 Test for dimensional stability. The test specimen shall be a square of cloth a minimum of 24 inches by 24 inches. Three specimens from each sample unit shall be tested in each of the warp and filling directions. The specimens shall be in equilibrium with standard conditions as defined in FED-STD-191 before marking and before determining dimensional change after subjection to boiling water. The specimen shall be laid without tension on a flat surface, care being taken that the cloth is free from wrinkles or creases. Three distances each at least 18 inches shall be measured and marked off in each of the warp and filling directions of the specimen. The distance shall be at least 6 inches apart, parallel to the respective yarns, and at least 2 inches from any edge. The distances shall be finely marked with water indelible ink, by sewing fine thread into the cloth, or with stamping machines.

4.5.1.1 Apparatus.

4.5.1.1.1 Wash wheel. A wash wheel with temperature controls or any suitable container in which boiling temperature can be maintained may be utilized.

4.5.1.1.2 Pressing equipment. Flat-bed press with means for maintaining the temperature at 135° to 149°C during the pressing operation.

4.5.1.1.3 Measuring scale. A suitable linear graduated scale or ruler.

4.5.1.2 Procedure. Completely submerge the test specimen in boiling water for a period of 15 minutes. The water shall be kept at a boil during the entire time of test. Weights shall be attached to the specimen so as to ensure that the specimen is completely submerged during the test. The specimen shall be withdrawn and extracted and shall then be removed from the extractor and allowed to air dry or be dried in a circulating air oven at a temperature not exceeding 85°C. The specimen, when dry, shall be smoothed to remove wrinkles or creases, but not distorted, and shall then be pressed with a flat-bed press at a temperature of 135° to 149°C.

4.5.1.3 Evaluation. The specimen shall be laid without tension on a flat surface and allowed to cool for 1/2 hour. The specimen shall then be allowed to reach equilibrium under standard conditions prior to measurement. Care shall be taken that the specimen is smooth and free from wrinkles or creases. The measured distances marked on the specimen shall again be measured in both the warp and filling directions and values recorded.

4.5.1.4 Calculation of results.

4.5.1.4.1 The shrinkage of the specimen shall be calculated as follows:

$$\text{Shrinkage (percent)} = \frac{A - B}{A} \times 100$$

where A = Average of initial measurements and
B = Average of measurements after test.

NOTE: When using the shrinkage ruler, the percent values are read directly and calculations are not required.

4.5.1.5 Report. The shrinkage of the sample unit in the warp and filling direction shall be the average of the specimens from each direction respectively and shall be reported separately to the nearest 0.1 percent. When a test result registers elongation (gain), rather than shrinkage, each elongation result shall be prefixed with a minus sign and both enclosed in parentheses.

5. PACKAGING

* 5.1 Put-up and preservation. Put-up and preservation shall be level A or Commercial, as specified (see 6.2).

5.1.1 Levels A and Commercial. The cloth shall be put-up and preserved in accordance with the application requirements of PPP-P-1133.

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

5.2.1 Levels A, B, and Commercial packing. The cloth shall be packed in accordance with the applicable requirements of PPP-P-1133.

5.3 Marking. In addition to any special marking required by the contract or purchase order, shipments shall be marked in accordance with the requirements of PPP-P-1133.

6. NOTES

6.1 Intended use. This cloth is intended for use in the rucksack (light-weight), the jungle hammock, and the carrying case for the collapsible canteen.

6.2 Ordering data. Acquisition documents should specify the following:

a. Title, number, and date of this document.
b. When a first article is required (see 3.2, 4.3, and 6.4).
c. Width required (see 3.5.1).
d. When length is other than specified (see 3.7).
e. Selection of applicable levels of preservation and packing (see 5.1 and 5.2).

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

* 6.4 First article. When a first article is required, it shall be inspected and approved under the appropriate provisions of FAR 52.209. 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 include specific instructions in all acquisition instruments regarding arrangements for selection, inspection, and approval of the first article.

* 6.5 Dyestuff formulation, olive green. A suggested, but not mandatory dyestuff formulation for olive green is as follows:

Acid Orange 156
Acid Red 266
Acid Blue 258
Acid Yellow 219

* 6.6 Subject term (key word) listing.

Canteen, collapsible
Cloth, plain weave, nylon
Rucksack
Hammock, jungle

6.7 Changes from previous issue. The margins of this document are marked with an asterisk (*) to indicate where changes (additions, modifications, corrections, deletions) from the previous issue were made. This was done as a convenience only, and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content, as written, irrespective of the marginal notations and relationship to the last previous issue.

Custodians:

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Navy - NU

Review activities.

Army - MD
Navy - MC
DLA - CT

Preparing activity:

Army - GL

Project No. 8305-0101

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STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

(See Instructions – Reverse Side)

1 DOCUMENT NUMBER	2 DOCUMENT TITLE
MIL-C-43128C	Cloth, Plain Weave, Nylon Water Repellent, OG-10b

3a NAME OF SUBMITTING ORGANIZATION	4 TYPE OF ORGANIZATION *(Mark one)*
	☐ VENDOR
	☐ USER
b ADDRESS *(Street City State ZIP Code)*	☐ MANUFACTURER
	☐ OTHER *(Specify)* _____

5 PROBLEM AREAS

a Paragraph Number and Wording

b Recommended Wording

c Reason/Rationale for Recommendation

6 REMARKS

7a NAME OF SUBMITTER *(Last First MI)* – Optional	b WORK TELEPHONE NUMBER *(Include Area Code)* – Optional
c MAILING ADDRESS *(Street City State ZIP Code)* – Optional	8 DATE OF SUBMISSION *(YYMMDD)*

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