

MIL-C-43375D(GL)

21 May 1981

SUPERSEDING

MIL-C-43375C(GL)

20 August 1974

## MILITARY SPECIFICATION

### CLOTH, DUCK, NYLON, 12.5 OUNCE

This specification is approved for use by the US Army Natick Research and Development Laboratories, Department of the Army and is available for use by all Departments and Agencies of the Department of Defense.

#### 1. SCOPE

1.1 Scope. This specification covers requirements for two classes of nylon duck cloth.

1.2 Classification. The cloth shall be of the following classes, as specified (see 6.2).

Class 1 - Dyed

Class 2 - Dyed, water-repellent

#### 2. APPLICABLE DOCUMENTS

2.1 Issues of documents. The following documents, of the issue in effect on date of invitation for bids or request for proposal, form a part of this specification to the extent specified herein:

##### SPECIFICATIONS

###### FEDERAL

PPP-P-1133 - Packaging and Packing 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: US Army Natick Research and Development Laboratories, Natick, MA 01760 by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

FSC 8305

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**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 specifications, standards, drawings and publications required by contractors in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

**LAWS AND REGULATIONS**

Rules and Regulations Under the Textile Fiber Products Identification Act

(Copies may be obtained without charge from the Federal Trade Commission, Washington, DC 20580.)

**3. REQUIREMENTS**

3.1 Standard sample. The cloth 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).

3.2 Material (see 6.5).

3.2.1 Yarn. The warp yarn shall be 840 nominal denier (93 Tex) bright multifilament nylon and the filling yarn shall be 420 nominal denier (47 Tex), 3 ply or single equivalent denier bright multifilament nylon, when tested as specified in 4.2.3.

3.3 Color. The color of the finished cloth shall be as specified (see 6.2 and 6.4) and shall match the standard sample.

3.3.1 Matching. The color shall match the standard sample under artificial daylight having a color temperature of  $7000 \pm 500$  kelvin and shall be a good approximation to the standard sample under incandescent lamplight at  $2850 \pm 100$  kelvin.

3.3.2 Colorfastness. The dyed and finished cloth shall show fastness to laundering, light and crocking equal to or better than the standard sample when tested as specified in 4.2.3. When a standard sample is not referenced for colorfastness, the dyed cloth shall show "good" fastness to laundering, light, and no more crocking than Munsell 8.5 when tested as specified in 4.2.3.

3.4 Physical requirements. The cloth shall conform to the minimum requirements specified in table I when tested as specified in 4.2.3.

TABLE I. Physical requirements

Weight oz/sq. yd. (g/m <sup>2</sup> )	Yarns per inch (/cm)		Breaking strength Pounds (Newton)		Air permeability cu. ft./min/sq. ft. (cm <sup>3</sup> /s/cm <sup>2</sup> )
	Warp	Filling	Warp	Filling	
12.5 (425)	56 (22)	28 (11)	800 (3560)	700 (3115)	3.0 (1.5)

3.4.1 Width. The width of the cloth shall be as specified (see 6.2). The minimal acceptable width shall be inclusive of the woven selvage when fly-shuttle looms are used and exclusive of the lock in selvage when shutterless looms are used. Raw edges shall not be permitted.

3.4.2 Weave. The weave shall be plain, one up, one down.

3.5 Finish. The class 1 cloth shall be scoured, dyed, and heat treated. The class 2 cloth shall be scoured, dyed, heat treated, and water repellent treated. The cloth shall not be bleached in any manner or process.

3.5.1 Water repellency, class 2. The class 2 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 material 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.

3.5.2 Spray rating, class 2. 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 4.2.3.

3.5.3 pH. The pH value of the finished cloth shall be not less than 5.0 nor more than 8.5 when tested as specified in 4.2.3.

3.6 Dimensional stability. The cloth shall have no more 2.0 percent dimensional change in either warp or filling direction when tested as specified in 4.2.3.

3.7 Length and put-up. Unless otherwise specified (see 6.2), the cloth shall be put-up in rolls in accordance with PPP-P-1133. Each roll shall contain not less than 80 yards (73 m). Each roll shall contain not more than four pieces, and each piece shall contain not less than 40 yards (37 m).

3.8 Face identification. The face side of the cloth shall be identified by applying a stamping on that side of the cloth with the word "Face" at each end of the roll.

3.9 Fiber identification. Each roll shall be labeled and ticketed for fiber content in accordance with the Textile Fiber Products Identification Act.

3.10 Workmanship. The finished cloth shall conform to the quality established by this specification. The demerit points per 100 square yards (84 m<sup>2</sup>) 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, the contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract, 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 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 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 specifications, drawings, and standards unless otherwise excluded, amended, modified, or qualified in this specification or applicable purchase document.

4.2.2 End item examination. Examination of the end item shall be in accordance with the provisions of 4.2.2.1 through 4.2.2.4.

4.2.2.1 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 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 4.2.2.1.1. 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 4 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 35 points. The lot shall be unacceptable if the points per 100 square yards of two or more individual rolls exceeds 53 points. If one roll exceeds 53 points per 100 square yards, a second sample of 20 rolls shall be examined only for individual roll quality examination. The lot shall be unacceptable if one or more rolls in the second sample exceeds 53 points per 100 square yards. Point computation for lot quality and individual roll quality shall be as follows:

$$\frac{\text{Total points scored in sample size x 3600}}{\text{Contracted width of cloth (inches) x total yards inspected}} = \text{Point per 100 square yards}$$

4.2.2.1.1 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.  
 Poor dye penetration, mottled, streaky, cloudy or striated in excess of that shown by the standard sample.  
 Overall uncleanness.  
 Width less than specified.  
 Raw edge.

4.2.2.2 Examination for length.

4.2.2.2.1 Individual rolls. During the yard-by-yard examination, each roll in the sample shall be examined for length and put-up. The lot shall be unacceptable if two or more rolls are defective for length and put-up. The following defects when present, shall be scored:

The length of any roll less than 80 yards.  
 Any piece less than 40 yards.  
 More than four pieces per roll.  
 The length of any roll more than 2 yards less than the length marked on the ticket.

4.2.2.2.2 Total yardage in the sample. The lot shall be unacceptable if the total of the actual length of the rolls in the sample is less than the total lengths marked on the ticket.

4.2.2.3 Examination for shade. During the yard-by-yard examination each roll in the sample shall be examined for shade. Any roll in the sample off shade, shaded side to side, side to center, or end to end, shall be cause for rejection of the entire lot represented by the sample.

4.2.2.4 Examination for face markings and compliance with the Textile Fiber Products Identification Act. During the yard-by-yard examination, each roll in the sample shall be examined for defects listed below. The lot shall be unacceptable if two or more of the following defects are present in the sample:

Not labeled or ticketed in accordance with rules and regulations under the Textile Fiber Products Act.  
 Face marking missing from either or both ends.  
 Face marking on wrong side.

4.2.3 End item testing. The methods of testing specified in FED-STD-191 wherever applicable, and as listed in table III shall be followed. The physical and chemical values specified in section 3 apply to the results of the determinations made on a sample unit for test purposes as specified in the applicable test method. The sample unit shall be 3 continuous yards of cloth, full width. The lot size shall be expressed in units of 1 yard each. The lot shall be unacceptable if one or more sample units fail to meet any of the requirements specified. The sample size shall be in accordance with table II. All test reports shall contain the individual values utilized in expressing the final results.

TABLE II. Sample size

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

TABLE III. Test methods

Characteristic	Requirement paragraph	Test method
Nylon identification:		
Luster	3.2.1	<u>1/</u>
Denier:		
Warp yarn	3.2.1	<u>1/</u>
Filling yarn	3.2.1	<u>1/</u>
Yarn ply	3.2.1	Visual <u>2/</u>
Colorfastness to:		
Laundering	3.3.2	5614
Light	3.3.2	5660
Crocking	3.3.2	5651
Weight	3.4	5041
Yarns per inch	3.4	5050
Breaking strength	3.4	5100
Air permeability	3.4	5450
Weave	3.4.2	Visual <u>2/</u>
Finish	3.5	<u>1/</u>
Absence of bleaching	3.5	<u>1/</u>
Water repellent material (class 2)	3.5.1	<u>1/</u>
Spray ratings (class 2)	3.5.2	5526
pH	3.5.3	2811
Dimensional stability	3.6	5556

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

2/ One determination shall be made from each sample unit and the result reported "pass" or "fail".

4.2.4 Packaging inspection. An examination shall be made in accordance with provisions of PPP-P-1133 to determine whether packaging, packing, and marking comply with the section 5 requirements.

## 5. PREPARATION FOR DELIVERY

5.1 Put-up and packaging. Put-up and packaging shall be level A or C as specified (see 6.2).

5.1.1 Levels A and C. The cloth, put up as specified in 3.7 shall be packaged in accordance with the applicable requirements of PPP-P-1133.

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

5.2.1 Levels A, B, and C. 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, shipments shall be marked in accordance with the applicable requirements of PPP-P-1133.

## 6. NOTES

6.1 Intended use. The cloth is intended for use in collapsible canteen covers and other equipage items.

6.2 Ordering data. Procurement documents should specify the following:

- (a) Title, number, and date of this specification.
- (b) Class of cloth required (see 1.2).
- (c) Color of cloth required (see 3.3).
- (d) Width of cloth required (see 3.4.1).
- (e) Selection of applicable levels of put-up, packaging and packing (see 5.1 and 5.2).

6.3 Standard sample. For access to standard sample, address the procuring activity issuing the invitation for bids.

6.4 Dyestuff formulation. A suggested but not mandatory dye formulation for Olive Green 106 is as follows: Acid Green 58, Acid Green 70, and Acid Orange 85.

6.5 Recycled material. It is encouraged that recycled material be used when practical as long as it meets the requirements of the specification.

6.6 Metric equivalents. Metric equivalents, indicated in parentheses throughout this document, are based on practices, conversion factors, and symbols specified in ASTM E 380 Standard for Metric Practice, and are for information only. In each instance, the value stated in U.S. customary units shall be controlling.

6.7 Changes from previous issue. Asterisks are not used in this revision to identify changes from the previous revision due to the extensiveness of the changes.

Custodian:

Army - GL

Review activities:

Army - MD  
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Preparing activity:

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Project No. 8305-A527



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3a. NAME OF SUBMITTING ORGANIZATION

4. TYPE OF ORGANIZATION (Mark one)

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## 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 / Code) - Optional

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