

MIL-C-43734D  
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SUPERSEDING  
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8 November 1984

## MILITARY SPECIFICATION

### CLOTH, DUCK, TEXTURED NYLON

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

#### 1. SCOPE

1.1 Scope. This document covers five classes of textured nylon duck cloth.

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

- Class 1 - Dyed Olive Green 106 (9.5 oz/sq yd)
- Class 2 - Woodland camouflage printed and water repellent treated (9.5 oz/sq yd)
- Class 3 - Dyed Olive Green 106, water repellent treated and coated (12.0 oz/sq yd)
- Class 4 - Woodland camouflage printed, water repellent treated, and coated (8.0 oz/sq yd)
- Class 5 - Woodland camouflage printed and water repellent treated (7.0 oz/sq yd)

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

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## 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

PPP-P-1133	- Packaging of Synthetic Fiber Fabrics
PPP-P-1136	- Packaging of Coated (Plastic; Rubber) and Laminated Fabrics

## 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
MIL-STD-1487	- Glossary of Cloth Coating Imperfections

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.

## DRAWINGS

## U.S. ARMY NATICK RESEARCH, DEVELOPMENT, AND ENGINEERING CENTER

2-1-1516	- Woodland Pattern - 48 inches
2-1-1516B	- Woodland Pattern - 60 inches

## Rules and Regulations Under the Textile Fiber Products Identification Act

(Application for copies should be addressed to the Federal Trade Commission, Pennsylvania Avenue at Sixth Street, N.W., Washington, DC 20580.)

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(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.)

2.2 Other 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 shall be those listed in the issue of the DODISS specified in the solicitation. Unless otherwise specified, the issues of documents not listed in the DODISS shall be the issues of the nongovernment documents which are current on the date of the solicitation.

## AMERICAN ASSOCIATION OF TEXTILE CHEMISTS AND COLORISTS (AATCC)

## Chromatic Transference Scale

Method 119 - Color Change Due to Flat Abrasion (Frosting):  
Screen Wire Method

(Application for copies should be addressed to the American Association of Textile Chemists and Colorists, P.O. Box 12215, Research Triangle Park, NC 27709.)

(Technical society and technical association documents are generally available for reference from libraries. They are also distributed among technical groups and using Federal agencies.)

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 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 Yarn. The yarn shall be textured continuous filament nylon of suitable denier to meet the requirements of this document (see 6.6).

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### 3.4 Color.

3.4.1 Classes 1 and 3. Unless otherwise specified (see 6.2), the color of classes 1 and 3 finished cloth shall be Olive Green 106 (see 6.5.1).

3.4.2 Classes 2, 4, and 5. The color of classes 2, 4, and 5 finished cloth shall be the Woodland camouflage pattern obtained by roller or screen printing using four rollers or screens as appropriate for Light Green 354, Dark Green 355, Brown 356, and Black 357 areas of the pattern (see 6.5.2.2). The dyeing of the ground shade approximating Light Green 354 and the printing shall be accomplished by using a combination of acid dyes except for Black 357 only, carbon black alone or in combination with acid dyes shall be used (see 6.5.2.1 and 6.5.2.2).

3.4.3 Matching. The color 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 temperature of  $7500 \pm 200$  K, with illumination of  $100 \pm 20$  foot candles, and shall be a good match to the standard sample under incandescent lamplight at  $2300 \pm 200$  K.

3.4.4 Colorfastness, classes 1 and 3. The dyed and finished cloth shall show fastness to accelerated weathering and crocking equal to or better than the standard sample, or shall show "good" fastness to accelerated weathering and shall show an AATCC Chromatic Transference Scale rating for crocking not less than 3.5. Testing shall be as specified in 4.4.3.

3.4.4.1 Colorfastness, classes 2, 4, and 5. The dyed and printed finished cloth shall show fastness to laundering (after 3 cycles), light, and crocking equal to or better than the standard sample, or, for laundering and light, equal to or better than the adjective rating of good. When no standard sample has been established or designated as applicable to colorfastness, except for Black 357, the printed cloth shall show "good" fastness to laundering (after 3 cycles) and light after 40 hours and shall show an AATCC Chromatic Transference Scale rating for crocking not less than 3.5. Black 357 shall show "fair" colorfastness to laundering (after 3 cycles) and light after 40 hours and shall shown an AATCC Chromatic Transference Scale rating for crocking not less than 1.0. If carbon black is used for Black 357, the resistance to frosting of the dyed cloth shall be equal to or better than the standard sample when tested as specified in 4.4.3.

3.4.5 Pattern execution, classes 2, 4, and 5. The pattern of the finished cloth shall reproduce the standard sample with respect to design, colors, and registration of the respective areas. The warpwise pattern repeat of the dyed, printed, and finished cloth shall be 27.25 inches (+1.25, -2.50 inches). Each pattern area shall show solid coverage. Skitteriness exceeding that shown by the standard sample in any of the printed areas will not be

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acceptable. When the standard sample is not referenced for pattern execution or design, the pattern on the base cloth shall match the standard Woodland camouflage pattern Drawing 2-1-1516 or 2-1-1516B, as applicable (see 6.2 and 6.3).

3.4.6 Infrared reflectance requirements, classes 2, 4, and 5. The infrared reflectance of the camouflage printed finished cloth shall conform to the requirements specified in table I when tested as specified in 4.4.3.

TABLE I. Infrared reflectance requirements (percent), classes 2, 4, and 5

Wavelengths (nanometers)	Black 357		Light Green 354		Dark Green 355 and Brown 356	
	Max	Min	Max	Min	Max	Min
600	-	10	20	8	13	3
620	-	10	20	8	13	3
640	-	10	20	8	13	3
660	-	10	22	8	13	3
680	-	10	36	10	22	3
700	-	10	60	18	46	8
720	-	10	78	26	66	20
740	-	10	84	40	80	30
760	-	10	86	50	88	32
780	-	10	88	55	90	32
800	-	10	88	55	90	32
820	-	10	88	55	90	32
840	-	10	88	55	90	32
860	-	10	88	55	90	32

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

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TABLE II. Physical requirements

Characteristic	Class 1		Class 2		Class 3		Class 4		Class 5	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Weight (ounces per square yd)	8.5	9.5	8.5	9.5	11.0	12.0	7.0	8.0	6.0	7.0
Yarns per inch:										
Warp	35	-	35	-	35	-	48	48	50	-
Filling	28	-	28	-	28	-	35	35	35	-
Breaking strength (pounds):										
Warp	500	-	500	-	500	-	325	-	325	-
Filling	300	-	300	-	300	-	250	-	225	-
Air permeability (cu ft/min/sq ft)	10	-	-	-	-	-	-	-	-	-

3.5.1 Width. The width of the finished cloth shall be as specified (see 6.2) and shall be the minimum acceptable width inclusive of selvages. When the cloths are woven on shuttleless looms, the width measurement shall be made between the last warp yarn on each side, with the protruding fringe(s) excluded.

3.5.2 Weave. The weave shall be plain with one up and one down. The use of a flyshuttle or shuttleless loom is permitted.

3.6 Finish (classes 1, 2, 3, 4, and 5). The cloth shall be thoroughly scoured, dyed, and heat set. The classes 2, 3, 4, and 5 cloth shall be given a water repellent treatment and classes 3 and 4 shall be back coated.

3.7 Water repellent (classes 2, 3, 4, and 5).

3.7.1 Water repellent treatment. The water repellent treatment shall consist of an approved fluorocarbon and a fluorocarbon extender (see 6.9).

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3.7.2 Back coating (classes 3 and 4). The scoured, dyed, and heat-set cloth shall be coated on the back side only with a suitable clear polyurethane coating compound. The coated cloth shall be water repellent treated on the face side. If plasticizers are used in the coating, only phosphate or phthalate ester type plasticizers shall be used.

3.7.3 Spray rating. The results of three individual determinations on the classes 3 and 4 finished coated cloth for spray rating shall be equal to or better than 100, 100, 90 initially and 90, 90, 80 after one laundering and classes 2 and 5 cloth shall be equal to or better than 90, 90, 80 initially when tested as specified in 4.4.3.

3.7.4 Resistance to organic liquid. The classes 2, 3, 4, and 5 finished cloth shall show no wetting by n-dodecane initially when tested as specified in 4.4.3.

3.7.5 Blocking (classes 3 and 4). The blocking properties at 180°F of the finished coated cloth shall not exceed scale number 3 when tested as specified in 4.4.3.

3.7.6 Resistance to low temperature (classes 3 and 4). The finished coated cloth shall be exposed to a temperature of minus  $40^{\circ} \pm 5^{\circ}\text{F}$  for a minimum of 4 hours and shall not show any cracking, flaking, or separation of the coating from the base cloth when tested as specified in 4.4.3.

3.7.7 Stiffness (classes 3 and 4). The stiffness of the finished coated cloth shall not be more than 0.034 pounds force in the warp direction nor more than 0.034 pounds force in the filling direction when tested as specified in 4.4.3.

3.7.8 Dynamic absorption. The classes 3 and 4 finished coated cloth shall show not more than a 20 percent increase in dynamic absorption properties, either initially or after one laundering and classes 2 and 5 cloth shall not be greater than 25 percent initially when tested as specified in 4.4.3.

3.7.9 Hydrostatic resistance (classes 3 and 4). The classes 3 and 4 finished cloth shall show no leakage below a hydrostatic height of 35 centimeters when tested as specified in 4.4.3.

3.8 pH. The pH value of the water extract of the finished cloth shall be not less than 4.5 nor more than 8.5 when tested as specified in 4.4.3.

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3.9 Dimensional stability. The cloth shall have an average dimensional change of no more than 3.0 percent in the warp and no more than 2.0 percent in the filling, with no single determination over 3.5 and 2.5 percent respectively.

3.10 Length and put-up. Unless otherwise specified (see 6.2), the cloth shall be furnished in continuous lengths, each not less than 40 yards. Each length shall be put-up on a roll as specified in 5.1.

3.11 Fiber identification. Each roll shall be labeled or ticketed for fiber content in accordance with the Rules and Regulations Under the Textile Fiber Products Identification Act.

3.12 Face identification (classes 1 and 3). The face side of the classes 1 and 3 cloths shall be identified by stamping that side with the word "FACE" at each end of the roll.

3.13 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. For class 3 and class 4 cloth, the occurrence of defects shall not exceed the applicable acceptable quality levels.

#### 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.



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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 the defects specified in 4.4.2 and tested for the characteristics specified in 4.4.3. The presence of any defect or failure to pass 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 (classes 1, 2, and 5). 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 35.0 points. The lot shall be unacceptable if the points per 100 square yards of two or more individual rolls exceeds 53.0 points. If one roll exceeds 53.0 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 53.0 points per 100 square yards. Point computation for lot quality and individual roll quality shall be as follows:

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

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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:

Hole, cut or tear  
 Objectionable odor  
 Baggy, ridgy or wavy cloth  
 Width less than specified  
 Edge ravel when pulled outward  
 Slack or tight selvages <sup>1/</sup>  
 Overall uncleanness  
 Pattern design not equal to standard sample (classes 2, 4, and 5)  
 Incorrect color in any part of the pattern (classes 2, 4, and 5)  
 Pattern repeat not equal to the standard sample (classes 2, 4, and 5)  
 Pattern repeat less than 24.75 inches or more than 28.50 inches (classes 2, 4, and 5)  
 Skitteriness (mottled, uneven color) of pattern exceeds that shown by standard sample (classes 2, 4, and 5)  
 Excessive feathering or spew (fuzziness at color boundaries) of pattern as compared to the standard sample (classes 2, 4, and 5)  
 Excessive grinning (off register, gap where ground shade shows through) of pattern as compared to the standard sample (classes 2, 4, and 5)  
 Excessive hallowing or trapping (overlapping of colors) of pattern as compared to the standard sample (classes 2, 4, and 5)

<sup>1/</sup> To determine the presence of unacceptable selva conditions, the following procedure shall be observed: During the visual examination, the perch shall be stopped a minimum of three times for each roll in the sample, the tension removed and the finished cloth examined for the selva conditions. A waviness in the selva or significant ripples diagonally across the width of the fabric is an indication of slack or tight selvages.

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4.4.2.2 ~~Yard-by-yard examination (classes 3 and 4)~~. The required yardage of each roll of the finished coated cloth shall be inspected on both sides for the visual defects listed below and as defined in MIL-STD-1487. The defects found shall be counted regardless of their proximity to each other, except where two or more defects represent a single local condition of the cloth, in which case only one defect shall be counted. A continuous defect shall be counted as one defect for each warpwise yard or fraction thereof in which it occurs. The lot size shall be expressed in yards. The sample unit shall be 1 linear yard. The inspection level shall be II and the acceptable quality level (AQL), expressed in terms of defects per hundred units, shall be 4.0. The number of rolls from which the sample yardage is to be selected shall be in accordance with table III. The sample yardage shall be apportioned equally among the selected rolls.

<u>Examine</u>	<u>Defect</u>
Coating	Any cut, hole, or tear Any uncoated area Any thinly coated area Any blister, tunnel, or delamination of coating Any lump or heavily coated area Crease or wrinkle that cannot be corrected by manual pressure or resulting in doubling or adhesion of surfaces Any spot, stain, or streak more than 1 inch in its longest dimension <sup>1/</sup> Any embedded foreign matter Any scorch or burn Any strike through of the coating to the uncoated side of the cloth Tackiness

<sup>1/</sup> Clearly visible at normal inspection distance (approximately 3 feet).

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TABLE III. Sample size (classes 3 and 4 only)

Lot size (yards)	Sample size (rolls)
Up to 1,200 <sup>1/</sup> inclusive	3
1,201 to 3,200 inclusive	5
3,201 to 10,000 inclusive	8
10,001 to 35,000 inclusive	13
35,001 to 150,000 inclusive	20
150,001 and over	32

<sup>1/</sup> If a lot contains fewer than three rolls, each roll in the lot shall be examined.

4.4.2.3 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 in respect to length. The lot shall be unacceptable if the total of the actual lengths of rolls in the sample is less than the total of the lengths marked on the tickets. The rolls examined shall be those selected for the examination of individual rolls.

4.4.2.4 Shade and appearance examination. During the yard-by-yard examination, each roll in the sample shall be examined for shade and appearance. Any roll in the sample off shade or shaded side to side, side to center, or 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.

4.4.2.5 Roll identification examination. 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 the Rules and Regulations  
Under the Textile Fiber Products Identification Act  
Face marking missing from either or both ends (classes 1 and 3)  
Face marking on wrong side (classes 1 and 3)

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4.4.3 End item testing. The cloth shall be tested for the characteristics indicated in table V. The methods of testing specified in FED-STD-191, wherever applicable, and as listed in table IV shall be followed. The physical and chemical values specified in section 3, except where otherwise indicated, apply to the results of the determinations made on a sample unit for test purposes as specified in the applicable test method. All test reports shall contain the individual values utilized in expressing the final result. The sample unit shall be 4 yards, full width of the finished cloth. The sample size shall be as follows and the lot shall be unacceptable if one or more sample units fail to meet any requirement specified.

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

TABLE IV. End item tests

<u>Characteristic</u>	<u>Requirement paragraph</u>	<u>Test method</u>
Yarn (textured continuous filament nylon)	3.3.1	<u>1/</u>
Colorfastness to: Accelerated weathering (classes 1 and 3)	3.4.4	5671 <u>2/</u>
Crocking (classes 1, 2, 3, 4, and 5)	3.4.4 and 3.4.4.1	5651
Laundering, after 3 cycles (classes 2, 4, and 5)	3.4.4.1	5614
Light (classes 2, 4, and 5)	3.4.4.1	5660
Resistance to frosting (classes 2, 4, and 5 only for carbon black-Black 357)	3.4.4.1	AATCC Method 119 <u>3/</u>
Infrared reflectance (classes 2, 4, and 5)	3.4.6	4.5.1
Weight	3.5	5041
Yarns per inch	3.5	5050
Breaking strength	3.5	5100

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TABLE IV. End item tests - Continued

Characteristic	Requirement paragraph	Test method
Air permeability (class 1)	3.5	5450
Weave	3.5.2	Visual <u>4/</u>
Finish	3.6	<u>1/</u>
Water repellents (classes 2, 3, 4, and 5)	3.7.1	<u>1/</u>
Back coating (classes 3 and 4)	3.7.2	<u>1/</u>
Spray rating:		
Initial (classes 2, 3, 4, and 5)	3.7.3	5526
After laundering (classes 3 and 4)	3.7.3	5556 <sup>5/</sup> and 5526
Resistance to organic liquid:		
Initial (classes 2, 3, 4, and 5)	3.7.4	4.5.2
Blocking (classes 3 and 4)	3.7.5	5872
Resistance to low temperature (classes 3 and 4)	3.7.6	5874
Stiffness (classes 3 and 4)	3.7.7	5202
Dynamic absorption:		
Initial (classes 2, 3, 4, and 5)	3.7.8	5500
After laundering (classes 3 and 4)	3.7.8	5556 <sup>5/</sup> and 5500
Hydrostatic resistance (classes 3 and 4)	3.7.9	5514 <u>6/</u>
pH	3.8	2811
Dimensional stability	3.9	5556 <u>5/</u>

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

2/ The time of exposure shall be 40 hours.

3/ Except that the number of abrasions cycles shall be 300.

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- 4/ One determination per sample unit and the results reported as "pass" or "fail".
- 5/ The Wool Laundering Method shall be used.
- 6/ Leakage is defined as the appearance of water at three or more different places within the 4 1/2 inch diameter test area. The uncoated side of the coated cloth shall contact the water.

4.4.4 Packaging inspection. The inspection shall be in accordance with the quality assurance provisions of PPP-P-1133 or PPP-P-1136, as applicable.

4.5 Methods of inspection.

4.5.1 Spectral reflectance measurements in the visible/near infrared. Spectral reflectance data shall be obtained from 600 to 800 nanometers (nm), at 20 nm intervals on a spectrophotometer (see 6.6) relative to a barium sulfate standard, the preferred white reference standard. Other white reference materials may be used, provided they are calibrated to absolute white; e.g., Halon, magnesium oxide, or vitrolite tiles (see 6.7). The spectral bandwidth shall be less than 26 nm at 860 nm. Reflectance measurements may be made by either the monochromatic or polychromatic mode of operation. When the polychromatic mode is used, the spectrophotometer shall operate with the specimen diffusely illuminated with the full emission of a source that simulates either CIE Source A or CIE Source D65. The specimen shall be measured as a single layer, backed with 8 layers for Light Green 354, 4 layers for Dark Green 355 and Brown 356, and 2 layers for Black 357 of the same fabric and shade. Measurements will be taken on a minimum of two different areas and the data averaged. The specimen shall be viewed at an angle no greater than 10° from normal, with the specular component included. Photometric accuracy of the spectrophotometer shall be within 1 percent, and wavelength accuracy within 2 nm. The standard aperture size used in the color measurement device shall be 1.0 to 1.25 inches in diameter. When the measured reflectance values for any color at four or more wavelengths do not meet the limits specified in Table I, it shall be a test failure.

4.5.2 Resistance to organic liquid test. Place a small specimen of the cloth on a smooth horizontal surface, face up. Using a pipette or eye dropper, gently deposit one drop of n-dodecane on the surface of the specimen. After 1 minute, examine the specimen under light at an angle. Absence of light reflectance at the fabric drop interface shall be taken as evidence of wetting. Three specimens taken at various locations across the sample shall be tested. Evidence of wetting on any specimen shall be considered a test failure.

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## 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. Classes 1, 2, and 5 cloth shall be put-up and preserved in accordance with the applicable requirements of PPP-P-1133. Classes 3 and 4 cloth shall be put-up and preserved in accordance with the applicable requirements of PPP-P-1136.

5.2 Packing. Packing shall be level A, B, or Commercial, as specified (see 6.1).

5.2.1 Levels A, B, and Commercial. Classes 1, 2, and 5 cloth shall be packed in accordance with the applicable requirements of PPP-P-1133. Classes 3 and 4 cloth shall be packed in accordance with the applicable requirements of PPP-P-1136.

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 or PPP-P-1136, as applicable.

## 6. NOTES

6.1 Intended use. The cloth is intended for use in the manufacture of the following:

- Class 1 - Men's comfort shoes
- Class 2 - Body Armor Fragmentation Protective Vest, Ground Troops
- Class 3 - Duffle bag
- Class 4 - Field Pack, Nuclear Biological Chemical (NBC) Bag
- Class 5 - Tactical Load Bearing Vest

6.2 Ordering data. Acquisition documents should specify the following:

- a. Title, number, and date of this document.
- b. Class of cloth required (see 1.2).
- c. When first article is required (see 3.2, 4.3, and 6.4).
- d. Width of cloth required (see 3.5.1).
- e. Color of classes 1 and 3, if other than specified (see 3.4.1).
- f. Length if other than specified (see 3.10).
- g. Woodland camouflage pattern drawing, if required (see 3.4.5).
- h. Selection of applicable levels of put-up, preservation, and packing (see 5.1 and 5.2).



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6.3 ~~Standard sample and pattern drawing.~~ For access to the standard shade sample (see 3.1) and the woodblock camouflage pattern drawing if applicable (see 3.4.3), 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 formulations.

6.5.1 Classes 1 and 3. The following dyes have been found acceptable for dyeing Olive Green 106.

Acid Orange 128  
Neutral Acid Red B  
Acid Blue 40  
Acid Blue 25

6.5.2 Classes 2, 4, and 5.

6.5.2.1 Ground shade. The following dyes have been found acceptable for dyeing the ground shade approximating Light Green 354:

Acid Blue 258  
Acid Orange 4R  
Acid Yellow 219

6.5.2.2 Printed shades. The printing of the Light Green 354, Dark Green 355, and Brown 356 colors may be accomplished by varying the amount of the following dyes:

Acid Orange 156  
Acid Red 266  
Acid Blue 258

Shade Black 357 may be satisfactorily printed with the use of carbon black alone or in combination with the above dyes.

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**6.6 Yarn.**

6.6.1 Classes 1, 2, and 3. Classes 1, 2, and 3 warp and filling nominal yarn sizes of 1000 denier, air texture, high tenacity, type 440 Cordura nylon are satisfactory for the manufacture of the cloth and are obtainable from E.I. duPont de Nemours Co., Wilmington, DE 19898.

6.6.2 Classes 4 and 5. Classes 4 and 5 warp and filling nominal yarn sizes of 500 denier, air texture, high tenacity, type 440 Cordura nylon are satisfactory for the manufacture of these cloths and are obtainable from the same source stated in 6.6.1.

6.7 Spectrophotometers. Suitable spectrophotometers for measuring spectral reflectance in the visible/near-infrared are the Diano Hardy, Diano Match Scan, Hunter D54P-IR, Hunter VIS/NIR spectrocolorimeter and Macbeth 1500 with IR option.

6.8 Source of material. Barium sulfate of suitable quality for use as a white standard is available from Eastman Kodak Co. The same source has available magnesium reagent (ribbon) and Halon. Suitable titles can be obtained from the National Bureau of Standards or from the instrument manufacturers.

6.9 Water repellency. Approval of such compounds and combinations is the responsibility of the U.S. Army Natick Research, Development, and Engineering Center, Natick, MA 01760-5014, and is based on more extensive tests, including those for toxicity, which are not set forth in this document. Because of the time necessary to conduct full evaluation (approximately 6 months), only those chemical treatments already approved and so listed in the invitation for bids or request for proposal shall be considered acceptable for the related procurement.

**6.10 Subject term (key word) listing.**

Camouflage, Woodland  
Cloth, Duck  
Equipage item  
Nylon  
Water repellency

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

MIL-C-43734D

Custodians:

Army - CL  
Navy - NU  
Air Force - 99

Preparing activity:

- Army - GL  
Project No. 8305-0158

Review activities:

Army - MD  
Navy - MC  
Air Force - 82  
DLA - CT

User activity:

Navy - YD

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**NOTE** This form may not be used to request copies of documents, nor to request waivers, deviations, or clarification of specification 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.

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Natick, MA 01760-5014



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## STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

(See Instructions - Reverse Side)

1 DOCUMENT NUMBER MIL-C-43734D		2 DOCUMENT TITLE Cloth, Duck, Textured Nylon	
3a. NAME OF SUBMITTING ORGANIZATION		4 TYPE OF ORGANIZATION (Mark one)	
b ADDRESS (Street City State ZIP Code)		<input type="checkbox"/> VENDOR <input type="checkbox"/> USER <input type="checkbox"/> MANUFACTURER <input type="checkbox"/> 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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82 MAR

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NATICK OP, 1 Apr 84