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INCH-POUND

MIL-DTL-508K
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SUPERSEDING
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DETAIL SPECIFICATION

CLOTH, OXFORD, NYLON, 3 OUNCE

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

1. SCOPE

1.1 Scope. This specification covers 3 ounce nylon oxford cloth.

1.2 Classification. The cloth is furnished in the following types and classes as specified (see 6.2):

Type I - For clothing, equipage, and personnel armor
Class 1 - Undyed
Class 2 - Dyed
Class 3 - Dyed and Water Repellent Treated (Quarpel Type)
Class 4 - Woodland Camouflage Printed and Water Repellent Treated (Quarpel Type)
Class 5 - Universal Camouflage Printed and Water Repellent Treated (Quarpel Type)
Type II - For coating

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in Sections 3 or 4, of this specification. This section does not include documents cited in other sections of this specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements of documents cited in Sections 3 or 4 of this specification, whether or not they are listed.

Comments, suggestions, or questions on this document should be addressed to: Defense Supply Center Philadelphia, Clothing and Textiles Directorate, Attn: DSCP-COET (Bldg 6), 700 Robbins Avenue, Philadelphia, PA 19111-5092 or emailed to: http://ct.dscp.dla.mil. Since contact information can change, you may want to verify the currency of this address information using Acquisition Streamlining and Standardization Information System (ASSIST) online database at http://assist.daps.dla.mil .

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2.2 Government documents.

2.2.1 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 cited in the solicitation or contract (see 6.2).

FEDERAL STANDARDS

FED-STD-4 - Glossary of Fabric Imperfections

(Copies of these documents are available online at http://assist.daps.dla.mil or from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

2.2.2 Other Government documents, drawings, and publications. The following other Government documents, drawings, and publications form a part of this document to the extent specified herein. Unless otherwise specified, the issues are those cited in the solicitation or contract.

DRAWINGS

U.S. ARMY RESEARCH, DEVELOPMENT, AND ENGINEERING COMMAND

2-1-1516 - Woodland Camouflage Pattern
2-1-2519 - Universal Camouflage Pattern

(Copies of drawings are available from the Natick Soldier Center, ATTN: AMSRD-NSC-IP-E, Natick, MA 01760-5019.)

FEDERAL TRADE COMMISSION

Rules and Regulations Under the Textile Fiber Products Identification Act

(Copies are available online at www.ftc.gov or from the Federal Trade Commission, 600 Pennsylvania Avenue, N.W., Washington, DC 20580-0001.)

2.3 Non-Government publications. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

AMERICAN SOCIETY FOR QUALITY

ANSI/ASQ Z1.4 - Sampling Procedures and Tables for Inspection by Attributes

(Copies are available online at www.asq.org or from the American Society for Quality, 600 North Plankinton Avenue, Milwaukee, WI 53203-2914.)

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AMERICAN ASSOCIATION OF TEXTILE CHEMISTS AND COLORISTS (AATCC)

AATCC Test Method 8 - Colorfastness to Crocking: AATCC Crockmeter Method
AATCC Test Method 15 - Colorfastness to Perspiration
AATCC Test Method 16 - Colorfastness to Light
AATCC Test Method 20 - Fiber Analysis: Qualitative
AATCC Test Method 22 - Water Repellency – Spray Test
AATCC Test Method 61- Colorfastness to Laundering, Home and Commercial: Accelerated
AATCC Test Method 81 - pH of the Water Extract from Wet Processing Textiles
AATCC Test Method 96 - Dimensional Changes in Commercial Laundering of Woven and Knitted Fabrics Except Wool
AATCC Test Method 118 - Oil Repellency: Hydrocarbon Resistance Test
AATCC Test Method 119 - Color Change Due to Flat Abrasion (Frosting): Screen Wire Method
AATCC Test Method 169 - Weather resistance of Textiles Xenon Lamp Exposure
AATCC Evaluation Procedure 1 - Gray Scale for Color Change
AATCC Evaluation Procedure 2 - Gray Scale for Staining
AATCC Evaluation Procedure 8 - AATCC 9-Step Chromatic Transference Scale
AATCC Evaluation Procedure 9 - Visual Assessment of Color Difference of Textiles

(Copies of documents are available on line at www.aatcc.org or from the American Association of Textile Chemists and Colorists, P.O. Box 12215, Research Triangle Park, NC 27709-2215.)

ASTM INTERNATIONAL

ASTM-B-170 - Standard Specification for Oxygen-Free Electrolytic Copper Refinery Shapes
ASTM-D-276 - Standard Test Methods for Identification of Fibers in Textiles
ASTM-D-3775 - Standard Test Method for Fabric Count of Woven Fabric
ASTM-D-3776 - Standard Test Methods for Mass per Unit Area (Weight) of Fabric
ASTM-D-5034 - Standard Test Method for Breaking Force and Elongation of Textile Fabrics (Grab Test)
ASTM-E-1452 - Standard Specification for Preparation of Calibration Solutions for Spectrophotometric and Spectroscopic Atomic Analysis

(Copies of documents are available on line at www.astm.org or from the ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19426-2959.)

2.4 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

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3.1 Standard sample. The dyed and finished cloth shall match the standard sample for shade and appearance and shall, unless otherwise indicated 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 Recycled, recovered, or environmentally preferable materials. Recycled, recovered, or environmentally preferable materials should be used to the maximum extent possible, provided that the material meets or exceeds the operational and maintenance requirements, and promotes economically advantageous life cycle costs.

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.

3.4.1 Class 1. The cloth shall be undyed.

3.4.2 Class 2 and 3. The color of the finished cloth shall be as specified (see 6.2).

3.4.3 Class 4, Woodland Camouflage. The cloth shall be dyed to a ground shade either matching or approximating Light Green 354 and then overprinting with the camouflage pattern by roller or screen printing. When the ground shade is dyed to match Light Green 354, the remaining colors shall be obtained by subsequent printing using three rollers or screens, as appropriate for the Dark Green 355, Brown 356, and Black 357 areas of the pattern. When the ground shade is dyed to approximate Light Green 354, all four colors of the camouflage pattern shall be obtained by subsequent printing using four rollers or screens to match all four colors (see 6.5). Resin bonded pigments are not permitted.

3.4.4 Class 5, Universal Camouflage. The cloth shall be dyed to a ground shade either matching or approximating Desert Sand 500 and then overprinting with the camouflage pattern by roller or screen printing. When the ground shade is dyed to match Desert Sand 500, the remaining colors shall be obtained by subsequent printing using two rollers or screens, as appropriate for the Urban Gray 501 and Foliage Green 502 areas of the pattern. When the ground shade is dyed to approximate Desert Sand 500, all three colors of the camouflage pattern shall be obtained by subsequent printing using three rollers or rotary screens to match all three colors (see 6.5). Resin bonded pigments are not permitted.

3.4.5 Labile Sulfur. Use of dyes and compounds containing elementary sulfur capable of oxidation to sulfuric acid is not permitted.

3.5 Visual shade matching (all except Class 1). The color and appearance of the cloth shall match the standard sample when viewed using the AATCC Evaluation Procedure 9, Option A, under filtered tungsten lamps that approximate artificial daylight D75 illuminant with a color

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temperature of 7500 ± 200 K illumination of 100 ± 20 foot candles, and shall be a good match to the standard sample under horizon lamplight at 2300 ± 200 K.

3.6 Colorfastness (all except Class 1 and Type II). The finished cloth shall conform to the colorfastness requirements listed below in Table I when tested as specified in 4.2.5.

TABLE I. Colorfastness requirements.

Colors Evaluation	Laundering (3 cycles) 1/ (min.)	Light (40 hrs or 170 kJ) 2/ (min.)	Perspiration (acid & alka-line) 1/ (min.)	Crocking 3/ (min.)	Accelerated Weathering (170 kJ) 1/ (min)	Frosting Carbon Black (only) 2/
All solid colors	3-4	3-4	3-4	3.5	3-4	
All colors except Black 357	3-4		3-4	4		
Black 357	3.0		3.0	1.0		4
OG 107, CG 483, Dk. Green 355, Brown 356, Black 357		3-4				
Lt. Green 354, Desert Sand 500, Urban Gray 501, Foliage Green 502		3.0				

1/ Rated using AATCC Evaluation Procedure 1 and Evaluation Procedure 2.
2/ Rated using AATCC Evaluation Procedure 1
3/ Rated using AATCC Evaluation Procedure 8

3.7 Pattern execution, Class 4 and 5. The pattern on the finished cloth shall match the standard sample with respect to design, colors and registration of the respective areas. Each pattern area shall show solid coverage. Skitteriness exceeding that shown by the standard sample shall not be acceptable. The warpwise pattern repeat of class 4 printed finished cloth shall be 27.25 (+1.25, -2.50) inches. The warpwise pattern repeat of the Class 5 printed finished cloth shall be 36 (+1.25, –2.50) inches. When the standard sample is not referenced for pattern execution, a pattern drawing shall be provided and the pattern for Class 4 shall match that of Drawing 2-1-1516 and Class 5 shall match that of drawing 2-1-2519 (see 2.2.2, 6.2, and 6.5).

3.8 Spectral reflectance, Class 2 and 3. The spectral reflectance values for the solid color specified shall conform to the requirements specified in Table II when tested as specified in 4.2.5.

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TABLE II. Spectral reflectance requirements, Class 2, and 3

Reflectance values (percent)						
Wavelength, Nanometers(nm)	Coyote 498		Camouflage Green 483		Foliage Green 504	
	Min.	Max.	Min.	Max.	Min.	Max.
600	8	20	3	10	8	18
620	8	20	3	10	8	18
640	8	22	3	10	8	20
660	8	24	3	12	10	26
680	10	24	3	14	12	32
700	14	24	4	28	20	40
720	16	28	5	40	22	46
740	20	34	10	52	24	46
760	30	44	18	56	26	48
780	40	50	20	56	30	48
800	45	56	24	58	34	50
820	50	58	30	60	34	54
840	52	58	38	60	36	54
860	52	62	40	60	38	56

3.8.1 Spectral reflectance, Class 4. The spectral reflectance values for each color in the Woodland Camouflage printed cloth shall conform to the requirements specified in Table III when tested as specified in 4.2.5.

TABLE III. Spectral reflectance requirements, Class 4

Reflectance values (percent)						
Wavelength, Nanometers(nm)	Light Green 354		Dark Green 355 and Brown 356		Black 357	
	Min.	Max.	Min.	Max.	Min.	Max.
600	8	20	3	9	-	-
620	8	20	3	9	-	-
640	8	20	3	9	-	-
660	8	20	3	12	-	-
680	10	30	3	14	-	-
700	18	50	5	28	-	20
720	22	54	7	44	-	30
740	30	56	12	52	-	33
760	35	58	18	56	-	33
780	40	62	26	56	-	34
800	55	80	34	56	-	34
820	55	80	42	60	-	35
840	55	82	44	60	-	35
860	60	82	44	60	-	35

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3.8.2 Spectral reflectance, Class 5. The spectral reflectance values for each color in the Universal Camouflage printed cloth shall conform to the requirements specified in Table IV when tested as specified in 4.2.5.

TABLE IV. Spectral reflectance requirements, Class 5.

Reflectance values (percent)						
Wavelength, Nanometers (nm)	Desert Sand 500		Urban Gray 501		Foliage Green 502	
	Min.	Max.	Min.	Max.	Min.	Max.
600	28	40	12	26	8	18
620	30	42	14	26	8	18
640	34	48	14	28	8	20
660	38	56	14	30	10	26
680	44	60	18	34	10	26
700	46	66	24	38	12	28
720	48	68	26	42	16	30
740	48	72	30	46	16	30
760	50	74	32	48	18	32
780	54	76	34	48	18	34
800	54	76	34	50	20	36
820	54	76	36	54	22	38
840	56	78	38	54	24	40
860	56	78	40	56	26	42

3.9 Physical requirements. The physical requirements of the finished cloth shall be as specified in table V when tested as specified in 4.2.5.

TABLE V. Physical requirements

Characteristic	All Classes
Weight, oz./sq.yd. Minimum	 2.9
Yarns per inch, (minimum) Warp Filling	 180 76
Breaking strength (pounds), minimum Warp Filling	 220 135

3.9.1 Weave. The weave shall be an oxford weave (a plain weave with two warp ends weaving as one) when tested as specified in 4.2.5. The use of fly shuttle or shuttleless loom is permitted.

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3.9.2 Width. For government procurements only, 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).

3.10 Finish. The type and character of finish shall conform to that shown by the standard sample for that specific type and Class.

3.10.1 Type I (Class 1, 2, and 3). The cloth shall be scoured, heat set, and lightly calendered. The heat setting shall be done with dry heat or boiling water or both as required to meet the requirements of 3.13.

3.10.2 Type I, (Class 3, 4 and 5). The cloth shall be thoroughly scoured and heat set prior to printing. The heat setting shall be performed so that the cloth meets the requirements of 3.13. The cloth shall be given a fluorocarbon (quarpel-type) water repellent treatment and shall conform to the requirements specified in 3.11 and 3.12.

3.10.3 Type II. The cloth shall be heat set, so that it meets the requirements of 3.13, but not calendered.

3.11 Spray rating (Type I, Class 3, 4 and 5). The results of the three individual determinations on the water repellent treated cloth sample for spray rating shall be equal to or better than 70, 70, 70 following three laundering, when tested as specified in 4.2.5.

3.12 Resistance to organic liquid (Type I, Class 3, 4 and 5). The cloth shall not show wetting by n-tetradecane either initially or after three cotton mobile laundering, when tested as specified in 4.2.5.

3.13 Dimensional stability. The cloth shall show no appreciable distortion or puckering. There shall not be more than 2.0 percent dimensional change in either warp or filling when tested as specified in 4.2.5.

3.14 Copper and manganese (Type II only). The finished cloth prior to coating shall contain not more than 0.003 percent copper nor more than 0.0015 percent manganese when tested as specified in 4.2.5.

3.15 pH. The pH value of the finished cloth shall be no lower than 5.0 nor higher than 8.5 when tested as specified in 4.2.5.

3.16 Length and put-up. For Government procurements only, unless otherwise specified (see 6.2), the finished cloth shall be furnished in continuous lengths each not less than 40 yards. Each length shall be put up in a full width on a roll.

3.17 Marking (Class 1, 2, and 3). The face side of the cloth shall be marked by applying a stamping on that side of the cloth and the word 'Face' at each end of the roll.

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

3.19 Workmanship. The finished cloth shall conform to the quality of product established by this specification. The demerit points per 100 square yards when calculated as specified in Section 4 shall not exceed the applicable established maximum point values.

3.20 Toxicity. The finished fabric shall not present a health hazard when used as intended and tested as specified in 4.4.

4. VERIFICATION

4.1 Conformance inspection. Conformance inspection shall include the examination of 4.2 and the tests of 4.2.3 as applicable. Sampling for inspection shall be performed in accordance with ANSI/ASQ Z1.4 and with quality acceptance levels as specified in the contract and/or order, except where otherwise indicated.

4.1.1 Material inspection. In accordance with 4.1 above, the material shall be inspected in accordance with all the requirements of referenced documents, unless otherwise excluded, amended, modified or qualified in this specification or applicable procurement documents.

4.2 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 4.2.1. 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 in accordance with the following:

Lot size (yards)	Sample size (rolls) 1/
3200 or less	8
3201 up to and including 10,000	13
10,001 and over	20

1/ No more than one roll shall be taken from any shipping container unless the number of shipping containers in the lot is less than the required number of rolls in which case rolls from all shipping containers shall be present in the sample.

The lot shall be unacceptable if the points per 100 square yards of the total yardage examined exceeds 20.0 points. The lot shall be unacceptable if the points per 100 square yards of two or more individual rolls exceeds 30.0 points. If one roll exceeds 45.0 points per 100 square yards, a second sample of the size indicated above shall be examined only for individual roll quality. The

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lot shall be unacceptable if one or more rolls in the second sample exceeds 45.0 points per 100 square yards. Point computation for lot quality and individual roll quality shall be as follows:

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

4.2.1 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:

Objectionable odor
Baggy, ridgy or wavy cloth
Width less than specified
Edge ravels when pulled outward
Slack or tight selvage 1/
Overall uncleanness
Uneven weaving
Poor dye penetration, mottled, streaky, or cloudy

For Type I, Classes 4 and 5:

Pattern design not equal to standard sample
Incorrect color in any part of the pattern
Pattern repeat not equal to the standard sample
Pattern repeat less than 24.75 inches or more than 28.50 inches (Class 4)
Pattern repeat less than 33.50 inches or more than 37.25 inches (Class 5)
Skitteriness (mottled, uneven color) of pattern exceeds that shown by standard sample
Excessive feathering or spew (fuzziness at color boundaries) of pattern as compared to the standard sample
Excessive grinning (off register, gap where ground shade shows through) of pattern as compared to the standard sample
Excessive haloing or trapping (overlapping of colors) of pattern as compared to the standard sample
Overall application of water repellent not uniform
Tackiness (sticky to touch)

1/ To determine the presence of unacceptable selvage 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 selvage conditions. Suspect rolls shall be removed from the perch and unrolled on the floor or

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table and further examined for the condition. A waviness in the selvage or significant ripples diagonally across the width of the fabric is an indication of slack or tight selvages.

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 in 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.

4.2.3 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; shaded side to side, side to center, or end to end; or not matching the standard sample for shade and appearance shall be cause for rejection of the entire lot represented by the sample.

4.2.4 Roll identification examination. During the yard-by-yard examination, each roll in the sample shall be examined for the defects listed below. The lot shall be unacceptable if two or more rolls in the sample contain one or more of the following defects:

Face identification missing from either or both ends (for Class 1, 2, and 3).
Not labeled or ticketed in accordance with the Rules and Regulations Under the Textile Fiber Products Identification Act.

4.2.5 End item testing. The cloth shall be tested for the characteristics listed in table VI. The methods of testing wherever applicable and as listed in table VI shall be followed. The physical and chemical values specified in section 3, except where otherwise specified, 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, full width of the finished cloth. The lot shall be unacceptable if one or more sample units fail to meet any test requirement specified. The sample size (number of sample units) shall be selected from different rolls in the lot as specified below:

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

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TABLE VI. End item tests

Characteristic	Requirement paragraph	Test method
Material		
Nylon Identification	3.3.1	AATCC-20 or ASTM-D-276 1/
Luster	3.3.1	Visual 1/
Multifilament	3.3.2	Visual 1/
Colorfastness: (4.3.1)		
Light	3.6	AATCC-16 Opt 1 or 3
Laundering (after 4 cycles)	3.6	AATCC-61 Test 3A
Crocking	3.6	AATCC-8
Perspiration (acid & alkaline)	3.6	AATCC-15
Accelerated weathering	3.6	AATCC-169, Opt 4
Frosting	3.6	AATCC-119
Spectral reflectance:		
Class 2 and 3	3.8	4.3.2
Class 4	3.8.1	4.3.2
Class 5	3.8.2	4.3.2
Weight	3.9	ASTM-D-3776
Breaking Strength	3.9	ASTM-D-5034
Yarns per inch	3.9	ASTM-D-3775
Weave	3.9.1	Visual
Water repellent treatment (Type I, Class 3, 4, and 5) Spray rating: After 3 launderings	3.11	AATCC-96, Test VIc and AATCC-22
Resistance to organic liquids	3.12	AATCC-118
pH	3.15	AATCC-81
Dimensional stability	3.13	AATCC 96 VIc 2/
Scouring (Type I)	3.10.1, 3.10.2	Visual
Calendered (Type I, classes 1,2, and 4	3.10.1	Visual
Heat Set	3.10.1, 3.10.2, 3.10.3	Visual
Copper and Manganese content (Type II)	3.14	ASTM-E-1452 and ASTM-B-170

1/ One determination shall be made from each sample unit and the results reported as "pass" or "fail".
2/ The dimensional stability shall be performed after one cycle. The cloth shall not be pressed after tumble dying prior to measurement.

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4.3 Methods of inspection.

4.3.1 Colorfastness evaluation testing. When testing for colorfastness properties, each color shall be evaluated, whenever possible, separately and reported as such. In cases where the print pattern does not allow for the evaluation of each color separately, the test results should indicate which colors were evaluated together.

4.3.2 Spectral reflectance test. Spectral reflectance data shall be obtained from 600 to 860 nanometers (nm) for Class 2, 3, 4 and 5 on a spectrophotometer 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. The spectral band width shall be less than 26 nm at 860 nm. Reflectance measurements shall be made by either the monochromatic or polychromatic mode of operation. When the polychromatic mode of operation is used, the spectrophotometer shall operate with the specimen diffusely illuminated with the full emission of a continuous source that simulates either CIE Source A or CIE Source D65. 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 for Woodland camouflage and 0.3725 inches or larger for the Universal camouflage. Areas to be measured for each color shall be lightly marked with a circle, at least 1.50 inches in diameter, on the reverse side of the fabric, and at least 6 inches from the selvage. The specimen shall be measured as a single layer backed with layers of the same fabric and shade. For Class 4 Woodland pattern cloth, three backing layers shall be used for Light Green 354, Dark Green 355 and Brown 356 colors. The specimen for Class 5 Universal pattern cloth, shall be measured as a single layer backed with four layers of the same shade. Measurements shall be taken on a minimum of two different areas and the data averaged. Any color having spectral reflectance values falling outside the limits at four or more of the wavelengths specified shall be considered a test failure.

4.4 Toxicity test. The contractor must furnish information, which certifies that the finished product is composed of materials, which have been safely used commercially or provide sufficient toxicity data to show compatibility with prolonged, direct skin contact. At a minimum, toxicity data should include results from a primary dermal irritation study in laboratory animals and a repeated insult human patch test (Modified Draize Procedure). The latter must be conducted under the supervision of a qualified dermatologist using at least 100 free-living individuals.

4.4.1 Toxicity documents. All finishes/chemicals used to process the garment shall be identified and accompanied by the appropriate Material Safety Data Sheet (MSDS) information. The use of chemicals recognized by the Environmental Protection Agency (EPD) as human carcinogens is prohibited.

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5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When actual packaging of material is to be performed by DoD personnel, these personnel need to contact the responsible packaging activity to ascertain requisite packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activity within the Military Department or Defense Agency, or within the Military Department's System Command. Packaging data retrieval is available from the managing Military Departments' or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

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 Type I cloth is for clothing, equipage and personnel armor. The Type II cloth is for coating. These cloths are intended for use in the manufacture of the crown for insect headset; button hole stay pieces for insect bar, nylon netting; lining for field trouser liner, artic trouser liner, field coat liner and parka liner; coverall outershell for anti-G coveralls; and outer cover material of body armor.

6.2 Acquisition requirements. Acquisition documents must specify the following:

a. Title, number, and date of this document.
b. Type and class of cloth required (see 1.2).
c. Color of cloth required (see 3.4).
d. Camouflage pattern drawing if required (see 3.7).
e. Width of cloth required (see 3.9.2).
f. Length required if other than specified (see 3.16).
g. Packaging (see 5.1)

6.3 Standard sample. For access to samples and pattern drawings, address the contracting activity issuing the invitation for bids or request for proposal.

6.4 Dye Combination (all Classes) both colorfastness and infrared spectral reflectance requirements have been satisfactorily met by the use of acid dyes. The black shade for the camouflage may be satisfactorily printed using carbon black alone or in combination with acid dyes.

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

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6.6 Fabric defect scales. Replica Kits are available from Fabric Defect Kits, Department 817HG, FC568B SEARS ROEBUCK AND CO., 3333 Beverly Road, Hoffman Estates, IL 60179. For information call (847) 286-8952.

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

6.8 Subject term (key word) listing.

Equipage
Personnel Armor
Woodland
Universal
Printed cloth
Water repellent treated
Coating

Custodians:

Army - GL
Navy - NU
Air Force - 99

Preparing activity:

DLA - CT

Project No. 8305-0860

Review activities:

Army – MD
Navy – AS
Navy - MC
Air Force - 11
Air Force - 82

*NOTE: The activities listed above were interested in this document as of the date of this document. Since organizations and responsibilities can change, you should verify the currency of the information above using ASSIST Online database at http://assist.daps.dla.mil .