INCH-POUND

MIL-C-44273
INTERIM AMENDMENT 2 (GL)
17 March 1992
SUPERSEDING
INTERIM AMENDMENT 1 (GL)
13 September 1990

MILITARY SPECIFICATION

CLOTH, LAMINATED, WATERPROOF, MOISTURE VAPOR

PERMEABLE, AND FLAME RESISTANT (4.6 oz)

This interim amendment is approved for use within the Department of the Army, with MIL-C-44273, dated 1 June 1987.

PAGE 1

Specification title: Delete "(4.6 oz)"

Add the following new paragraph:

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

Class 1 - Woodland camouflage printed
Class 2 - Desert camouflage printed
Class 3 - Sage green 1590
Class 4 - Tan 380"

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2.1.2: Add the following:

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

2-1-1516B - Woodland Pattern - 60 inches
2-1-2240 - 3-Color Desert Pattern - 48 & 60 inch pattern

(Copies of drawings are available from the U.S. Army Natick Research, Development, and Engineering Center, STRNC-UX, Natick, MA 01760-5017.)

2.2: Add the following:

"AMERICAN ASSOCIATION OF TEXTILE CHEMIST AND COLORISTS

AATCC Method 16 - Colorfastness to Light: Option E - Water-Cooled Xenon-Arc Lamp, Continuous Light"

(Application for copies should be addressed to the American Association of Textile Chemists and Solorists, P.O. Box 12215, Research Triangle Park, NC 27709-2215.)

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3.3.1.1: Delete and substitute:

"3.3.1.1 Face. The face cloth shall be plain weave conforming to type II of MIL-C-83429. The class(color) shall be as specified (see 6.2)."

Table I: Delete and substitute:

"TABLE I. Physical requirements

Characteristics	Minimum	Maximum
Weight, oz/sq.yd.		
Classes 1 and 2	5.1	7.2
Classes 3 and 4	4.7	6.2
Breaking strength, lbs.		
Warp	160	-
Filling	100	-
Tear strength, lbs.		
Warp filling	5.5	-
Filling	4.0	-
Hydrostatic resistance, psi		
Fabric side facing water	50	-
Film side facing water	200	-
Moisture vapor transmission rate,		
Procedure B, $g/m^2/24$ hrs.	650	-
Flame resistance, warp and filling		
After flame, seconds	-	2
After glow, seconds	-	25
Char length, inches	-	5
Water permeability		
Initial	No leakage	-
After synthetic perspiration	No leakage	-
After exposure to aircraft fluids	No leakage	-

"

Add the following new paragraph:

"3.4.3 Electrostatic decay. The laminated cloth shall, when charged toward 5000 volts, reach a minimum level of 4000 volts and shall dissipate 90 percent of this charge within 1/2 second (decay time less than 1/2 second). The average warp results and the average filling results shall meet these requirements when tested as specified in 4.4.3."

3.5: Delete and substitute:

"Color. The color of the face side of the laminated cloth shall be Woodland Pattern Camouflage for class 1, 3-Color Desert Pattern Camouflage for class 2, Sage Green 1590 for class 3, and Tan 380 for class 4."

3.5.1, line 3: Delete "7000 ± 500" and substitute "7500 ± 200".
Line 5: Delete "100" and substitute "200".

3.5.2, line 2: Delete "after 6 standard fading hours" and substitute "(after 6 standard fading hours when carbon arc is used and after 20 kilojoules per square meter when xenon is used)".

Line 3: Delete "sample" and substitute "sample or equal to or better than a rating of "good" ".

3.5.4, lines 2 and 5: Delete "sample unit" and substitute "specimen".

Lines 3 and 5: Delete "lot" and substitute "sample unit".

3.5.5 and table II: Delete in entirely and substitute:

"3.5.5 Infrared reflectance.

3.5.5.1 Spectral reflectance requirements, class 1. The spectral reflectance of each color for the Woodland camouflage printed cloth shall conform to the requirements specified in table II, when tested as specified in 4.5.

TABLE II. Spectral reflectance requirements, class 1

Wavelength, Nanometers (nm)	Reflectance values (percent)					
	Black 357		Light Green 354		Dark Green 355 and Brown 356	
	Min.	Max.	Min.	Max.	Min.	Max.
600	-	20	8	18	3	10
620	-	20	8	18	3	10
640	-	20	8	18	3	10

TABLE II. Spectral reflectance requirements, class 1 (cont'd)

Wavelength, Nanometers (nm)	Reflectance values (percent)					
	Black 357		Light Green 354		Dark Green 355 and Brown 356	
	Min.	Max.	Min.	Max.	Min.	Max.
660	-	20	8	18	3	12
680	-	20	10	22	3	14
700	-	20	18	33	5	18
720	-	20	22	45	5	25
740	-	20	30	55	12	28
760	-	20	35	65	18	36
780	-	20	40	75	26	44
800	-	25	43	80	34	52
820	-	25	45	86	36	60
840	-	25	45	88	36	68
860	-	25	45	90	36	74

3.5.5.2 Spectral reflectance requirements, class 2. The spectral reflectance of each color for the 3-Color Desert camouflage printed cloth shall conform to the requirements specified in table IIA, when tested as specified in 4.5.

TABLE IIA. Spectral reflectance requirements, class 2

Wavelength, Nanometers (nm)	Reflectance values (percent)					
	Light Tan 492		Light Brown 493		Light Khaki 494	
	Min.	Max.	Min.	Max.	Min.	Max.
700	38	65	19	53	25	62
720	38	66	20	58	25	64
740	39	67	20	62	25	66
760	40	67	21	64	26	67
780	41	67	21	65	27	67
800	43	67	22	65	28	67
820	45	67	23	66	30	68
840	48	68	24	67	33	68
860	50	70	25	68	36	69

3.5.5.3 Spectral reflectance requirements, class 3 and 4. The spectral reflectance of class 3 Sage Green 1590 and class 4 Tan 380 shall conform to the requirements specified in table IIB, when tested as specified in 4.5.

TABLE IIB. Spectral reflectance requirements, classes 3 and 4

Wavelength, Nanometers (nm)	Reflectance values (percent) Class 3, Sage Green 1590 Min.	Max.	Class 4, Tan 380 Min.	Max.
600	8	13	-	-
620	8	13	-	-
640	8	13	-	-
660	8	13	-	-
680	10	18	-	-
700	16	28	25	53
720	22	40	25	54
740	30	51	25	55
760	35	61	26	56
780	40	70	27	57
800	45	77	28	58
820	50	81	30	59
840	55	82	33	62
860	60	82	36	65

"

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4.4.2.3: Delete and substitute:

"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 appearance on the face side. The lot shall be unacceptable if two or more rolls (classes 3 and 4) are off shade, shaded side to side, shaded side to center, or shaded end to end; if any roll (classes 1 and 2) fails to match the standard sample with respect to color for all pattern areas; or if any roll (all classes) does not have the same appearance as the standard sample."

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Table IV, in "Test method column": Delete "5660" and substitute "5660 6/ or 4.5.5".

Add the following new test:

"Electrostatic decay 3.4.3 5931"

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Table IV, footnote 2/: Add "The specimens shall not be pressed."

Footnote 4/: Add "CAUTION: Use of an explosion proof oven is recommended."

Add the following new footnote:

"6/ Except that the specimen shall be compared to the standard sample after 6 standard fading hours and evaluated."

4.5.1, line 2: Delete "nm" and substitute "nanometers (nm) for the Woodland Camouflage colors and Sage Green 1590 and from 700 to 860 nm for Tan 380 and 3-Color Desert Camouflage colors, at 20 nm intervals on a spectrophotometer (see 6.4)."

Line 5, after "tile": Insert "tile (see 6.5)".

Line 11: Delete "eight".

Line 12, after "film": Add "Eight backing layers shall be used for Sage Green 1590, Tan 380 and 3-Color Desert Camouflage colors Light Tan 492, Light Brown 493 and Light Khaki 494. Five backing layers shall be used for Light Green 354, Dark Green 355 and Brown 356 colors. Three backing layers shall be used for Black 357."

Add the following new paragraph:

"4.5.5 Colorfastness to light (Xenon lamp exposure). The following Xenon colorfastness to light test method may be used as an alternative to Method 5660 of FED-STD-191. The test procedure shall be in accordance with AATCC Method 16 Option E (Water cooled, Continuous light cycle) except that the following deviations shall apply:

a. The test apparatus shall be an Atlas ci35 or ci65 Fadeometer with either two or three-tiered (preferably a three-tiered) inclined specimen rack. The apparatus shall be equipped with an automatic light monitor and shall be capable of automatically controlling irradiance, temperature, and humidity. The apparatus shall be maintained in accordance with the manufacturer's recommendations.

b. The irradiance level shall be 0.55 ± 0.01 watt/square meter/nanometer ($w/m^2/nm$) bandpass at 340 nanometers.

c. The glass filter combination shall be a borosilicate Type "S" inner and outer filter.

d. The relative humidity shall be 50 ± 5 percent during the entire cycle.

e. The equipment shall be operated to maintain the following tolerances:

Black panel	63 ± 2°C
Conditioning water	50 ± 4°C
Dry Bulb	45 ± 2°C
Wet Bulb depression 1/	10°C

1/ As a guide only; adjust to achieve required relative humidity (see d. above).

f. The test specimen and the AATCC Blue Wool Lightfastness Standard shall be mounted on white cardboard. When mounted test specimens are masked, use test mask approaching zero light transmittance.

g. The test shall be continued until the energy exposure is equal to 20 kilojoules per square meter.

NOTE: Monitoring of the dry bulb temperature, wet bulb depression, irradiance, and black panel temperature is recommended through the use of chart recorders."

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6.2: Add "f. Color required (see 3.3.1.1)."

6.4: Delete and substitute:

"6.4 Spectrophotometers. Suitable spectrophotometers for measuring spectral reflectance in the visible/near infrared are the Diano Hardy, Diano Match Scan, Milton Roy Match Scan 2, Hunter D54P-IR, Applied Color Systems Spectro Sensor I and II and CS-5, Hunter VIS/NIR spectrocolorimeter, and Macbeth 1500 with IR option."

6.5, last sentence: Delete and substitute "The same source has available magnesium reagent (ribbon) and Halon. Suitable tiles can be obtained from the National Institute of Standards Technology or the instrument manufacturers."

Preparing activity:

Army - GL

(Project 8305-A459)