

INCH-POUND

MIL-C-83429B
INTERIM AMENDMENT 2 (GL)
26 MAY 1993
SUPERSEDING
INTERIM AMENDMENT 1 (GL)
17 MARCH 1992

MILITARY SPECIFICATION

CLOTH, PLAIN AND BASKET WEAVE, ARAMID

This interim amendment is approved for use within the Department of the Army, with MIL-C-83429B dated 26 September 1990.

PAGE 1

1.2, under "Class 6": Add the following:

"Class 7 - Desert camouflage printed (3 color), aramid blend"

PAGE 2

2.1.2, under "2-1-1516B - Woodland Pattern - 60 inches": Add the following:

"2-1-2240 - 3 Color Desert Pattern 48 & 60 inch pattern"

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2.2, under "Chromatic Transference Scale": Add the following:

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

Line 11: Delete "AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)" and substitute "ASTM"

Under "D 1424" test method: Add the following:

"D 5034 - Breaking Force and Elongation of Textile Fabrics (Grab Test)"

Lines 14 and 15: delete "American Society for Testing and Materials" and substitute "ASTM"

AMSC N/A

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FSC 8305

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PAGE 4

3.3.1.: Delete entirely and substitute the following:

"3.3.1 Aramid fiber blend. The blend shall consist of 92 percent meta-aramid fiber, 5 percent para-aramid fiber and 3 percent conductive fiber. The aramid fibers shall have a nominal denier of 1.5 to 1.7 denier per filament, a staple length of 1-1/2 to 2 inches, and shall not char at a temperature less than 675⁰F. The conductive fiber shall be a nylon sheathed carbon core fiber and shall be 3 denier per filament, and 1-1/2 to 2 inches in staple length (see 6.5)"

3.3.1.1: delete in its entirety.

After 3.3.1 add the following new paragraph:

"3.3.2 Yarn The yarn for both the warp and filling shall be spun into singles for the type I cloth and 2-ply for the Type II cloth."

3.4.2, line 3:delete "pattern' and substitute "colors"

Line 5, before "screen printing": Add "automatic"

At end of paragraph: Add "Resin bonded pigments are not permitted."

Under 3.4.2: Add the following new paragraph:

"3.4.2.1 Type II, class 7. The cloth shall be colored to a ground shade either matching or approximating Light Tan 492 and subsequently overprinted with the applicable desert camouflage colors. When the ground shade is colored to match the Light Tan 492, the Desert Camouflage pattern shall be obtained by roller or automatic screen printing using two rollers or screens, as appropriate for the Light Brown 493 and Light Khaki 494 areas of the pattern. If the ground shade is colored to approximate the Light Tan 492, three rollers or screens shall be used to match the required pattern. Resin bonded pigments are not permitted."

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3.4.5: Delete and substitute the following:

"3.4.5 Colorfastness, types I and II, class 6. The finished cloth shall show fastness to laundering (after 3 cycles), light (after 6 standard fading hours when carbon arc is used and after 20 kilojoules per square meter when xenon is used) equal to or better than the standard sample when tested as specified in 4.4.3."

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3.4.6: Delete and substitute the following:

"3.4.6 Colorfastness, type II, classes 5 and 7. The finished cloth shall show fastness to laundering (after 3 cycles), light (after 6 standard fading hours when carbon arc is used and after 20 kilojoules per square meter when xenon is used) and perspiration equal to or better than the standard sample for each of the pattern areas. The finished cloth shall show fastness to crocking equal to or better than the standard sample or shall have an AATCC Chromatic Transference scale rating of not lower than 3.5 for all the pattern areas, except Black 357 (type II, class 5) which shall have an AATCC Chromatic Transference Scale rating of not lower than 1.0. Testing shall be as specified in 4.4.3."

3.5: Delete and substitute the following:

"3.5 Pattern execution, classes 5 and 7. The pattern 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 in any of the printed areas will not be acceptable. The pattern repeat of the class 5 Woodland Camouflage printed finished cloth shall be 27.25 +1.25 -2.5 inches. The pattern repeat of the class 7, 3 color Desert Camouflage printed finished cloth shall be 16.75 +1.25 -1.75 inches. When the standard sample is not available for pattern execution, a pattern drawing shall be provided, and the pattern on the finished cloth shall match that of the drawing (see 2.1.2 and 6.2)."

3.6.1: Delete table I and substitute the following:

"TABLE I. Spectral reflectance requirements, type II, class 5

Wavelengths nanometers (nm)	<u>Reflectance values (percent)</u>					
	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
660	-	20	8	18	3	12
680	-	20	10	22	3	14
700	-	20	18	40	5	28
720	-	20	22	58	5	45
740	-	20	30	70	12	62
760	-	20	35	78	18	80
780	-	20	40	82	26	82

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"TABLE I. Spectral reflectance requirements, type II, class 5

Wavelengths nanometers (nm)	<u>Reflectance values (percent)</u>					
	Black 357		Light Green 354		Dark Green 355 and Brown 356	
	(min)	(max)	(min)	(max)	(min)	(max)
800	-	20	43	84	34	84
820	-	20	45	86	36	85
840	-	20	45	88	36	86
860	-	20	45	90	36	86

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Delete 3.6.1 in its entirety and substitute the following:

"3.6.2 Spectral reflectance, Type II, Class 6. The spectral reflectance for Tan 380 finished cloth shall conform to the requirements specified in table II, when tested as specified in 4.4.3.

Table II Spectral reflectance, Tan 380.

Wavelength Nanometers (nm)	<u>Reflectance values (percent)</u>	
	Tan 380	
	Min.	Max.
700	25	53
720	25	54
740	25	55
760	26	56
780	27	57
800	28	58
820	30	59
840	33	62
860	36	65

Under table II: Add the following new paragraph and Table:

"3.6.3 Spectral reflectance, type II, class 7. The spectral reflectance of each color for the 3 Color Desert Camouflage printed finished cloth shall conform to the requirements specified in table IIA, when tested as specified in 4.4.3.

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TABLE IIA. Spectral reflectance requirements, type II, class 7

Wavelengths nanometers (nm)	<u>Reflectance values (percent)</u>					
	Light Tan 492 (min)	(max)	Light Brown 493 (min)	(max)	Light Khaki 494 (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

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In table III, under "Type II": Delete "Class 5" and substitute "Classes 5 and 7".

Across from "Yarns per inch, Warp", under "Type II, Class 5": Delete "69" and substitute "66".

Across from "Tearing strength, lbs., Warp and Filling", under "Type II, Class 5": delete "9" and "7" respectively and substitute "8" and "5" respectively.

Across from "Char length, inches": Delete all values of "3.5" and substitute "4.0".

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3.8: Delete and substitute the following:

"3.8 Finishing. The cloth shall be desized, scoured and heat-set."

3.8.1: Delete and substitute the following:

"3.8.1 Electrostatic Decay. The finished cloth shall, when charged toward +5000 volts and -5000 volts, reach a minimum level of +4000 and -4000 volts respectively and shall dissipate 90 percent of this charge in less than or equal to 1/2 second. The average warp results and average filling results shall meet these requirements before and after five launderings when tested as specified in 4.4.3."

3.8.2: delete in its entirety.

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3.9, line 1: delete "4.0" and substitute "5.0".

3.11: Delete and substitute the following:

"3.11 Dimensional stability. The type I and type II class 6 cloth shall not shrink more than 4.0 percent in the warp direction nor more than 1.5 percent in the filling direction, after fifteen launderings. The shrinkage in the warp or filling directions for type II, classes 5 and 7 cloth shall be not greater than 3.5 percent for individual specimen and not greater than 3.0 percent for the sample unit average after five launderings. Testing shall be as specified in 4.4.3. The preshrinking process shall not be identified by name or trademark, either on the cloth, ticket or package."

3.14: Add the following sentence to end of paragraph: "Face identification is not required for type II classes 5 and 7 printed cloth."

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4.4.2.1, Yard by yard examination.: Line 19 delete "50" and substitute "34", Line 20 delete "75" and substitute "50", Line "21" delete "75" and substitute "50", Line 23 delete "75" and substitute "50".

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4.4.2.1.1, lines 4, 5, 6, 10, 12, 14 and 16: delete "class 5" and substitute "classes 5 and 7"

Add the following defect:

"Pattern repeat less than 15.0 inches or more than 18.0 inches (class 7)"

4.4.2.3, line 5: delete "class 5" and substitute "classes 5 and 7".

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4.4.3: Delete the fourth sentence entirely and substitute "The sample unit shall be 5 continuous yards full width of the finished cloth."

In table IV: Delete entry for "Conductive fiber" in its entirety.

Under "Colorfastness to:", after "Type II": Delete

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"class 5" and substitute "classes 5 and 7".

Under "(Type II class 5)", across from "Light", in Test method column, after "5660 4/" : Add "or 4.5.5"

Under "Flame resistance", after "laundryings": Delete "(class 5)" and substitute "(classes 5 and 7)".

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In table IV: delete entry for "Nonfibrous material" in its entirety.

Delete entry for "Dimensional stability after fifteen laundryings:" and substitute the following entries in their respective columns:

"Dimensional stability:
After 15 laundryings
(Type I and Type II class 6)3.11.....5556 5/
After 5 laundryings

(Type II classes 5 and 7).....3.11.....5556 5/"

4.5.1, line 4, after "Tan 380": Insert "and 3 Color Desert Camouflage colors".

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4.5.1 cont'd, line 12, after "Tan 380": Add "and for the 3 Color Desert camouflage colors, Light Tan 492, Light Brown 493 and Light Khaki 494".

Line 16, after "Woodland Camouflage": Add "and 3 Color Desert Camouflage".

after paragraph 4.5.4: 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, ci65 with a three-tiered inclined specimen rack, or an Atlas ci3000 Fadeometer. 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.

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b. The irradiance level shall be 0.35 ± 0.02 watt/square meter/nanometer ($W/m^2/nm$) bandpass at 340 nanometers.

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

d. The relative humidity shall be 50 ± 5 percent during the entire cycle. The temperature control set points shall be as follows: Black panel: $63^{\circ}C \pm 2$, Conditioning water $50^{\circ}C \pm 3$ and Dry Bulb $45^{\circ}C \pm 3$. The approximate Wet Bulb Depression is $10^{\circ}C$ (may need to be adjusted to achieve the required relative humidity).

e. The test specimen shall be mounted on white cardboard and half masked (covered) with paper approaching zero light transmittance.

f. 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. To minimize test variation, interruption of the test cycle (stop and go) should be kept to a minimum."

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6.5: Delete and substitute the following two paragraphs:

"6.5 Material. The cloth has been successfully manufactured with yarns produced from an intimate fiber blend of 92 percent Nomex, 5 percent Kevlar and 3 percent P-140. The fiber blend is available in bale form from E.I. DuPont de Nemours & Co. Inc., Wilmington, DE 19880."

"6.5.1 Yarn. Cloth woven with 24/1 yarn for both the warp and filling has been found to meet the requirements for type I, and cloth woven with 37/2 yarn for both the warp and filling has been found to meet the requirements for type II, class 6."

6.6: delete in its entirety.

6.6.1: delete in its entirety.

6.8, line 2, after "Scan,": Insert 'Milton Roy match Scan 2,'.

Line 3, after "D54P-IR,": Insert "Applied Color Systems Spectro Sensor I and II and CS-5,".

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6.9, line 4: delete "National Bureau of Standards" and substitute "National Institute of Standards and Technology".

Custodians:

Army - GL
Navy - NU
Air Force - 11

Preparing Activity:
DLA-CT

Project number:
8305 - 0501

Review activities:

Army - MD
Navy - AS
Air Force - 82, 99

User activity:

Air Force - 45