

MIL-C-21115K  
18 December 1987  
SUPERSEDING  
MIL-C-21115J  
21 December 1983

## MILITARY SPECIFICATION

### CLOTH, TROPICAL: WOOL, POLYESTER/WOOL

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

#### 1. SCOPE

1.1 Scope. This document covers wool and polyester/wool blend tropical cloths.

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

Type I	- Wool
Class 1	- 10.5 ounce
Class 2	- 8.5 ounce
Type III	- Polyester/wool blend
Class 1	- 9.0 ounce
Class 2	- 7.7 ounce
Class 3	- 10.0 ounce
Class 4	- 10.25 ounce

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/NA

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-1132 - Packaging of Woolen, Worsted and Wool Blend  
(Synthetic Fiber; Cotton) Fabrics

##### MILITARY

MIL-C-43665 - Cloth Wool. Mothproofing Treatment Of

#### STANDARDS

##### FEDERAL

FED-STD-191 - Textile Test Methods

##### MILITARY

MIL-STD-105 - Sampling Procedures and Tables for Inspection  
by Attributes

MIL-STD-655 - Provisions for Evaluating Quality of Cloth, Wool,  
Worsted and Wool Blends

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.

Rules and Regulations Under the Wool Products Labeling Act  
(16 CFR Part 300)

(Application for copies should be addressed to the Federal Trade Commission, Correspondence Branch, Washington, DC 20580-0001 or to the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402-0001.)

(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.)

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- \* 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 No. 128 - Wrinkle Recovery of Fabrics Appearance Method

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

## AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

## D 2130 - Diameter of Wool and Other Animal Fibers by Microprojection

(Applications for copies should be addressed to the American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103-1187.)

(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).

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3.2 Materials.3.2.1 Stock.

3.2.1.1 Wool. The stock shall be fleece or pulled wool or both, not lower in grade than 64's U.S. Standard, when tested as specified in 4.2.4. The use of laps, noils, or any other wool manufacturing by-product is prohibited (see 4.2.2).

3.2.1.2 Polyester. The stock shall be semi-dull polyester fiber made from polyethylene glycol terephthalate, either homopolymer or modified polymer as appropriate (see 6.6). The minimum average fiber length shall be 3 inches for the type III cloth. The denier shall be suitable to blend adequately with the specified wool grade and meet the requirements of this document (see 4.2.1.1).

3.2.2 Yarn.

3.2.2.1 Wool yarn, for type I. The wool yarn shall be spun from combed top on either the Bradford, French, or American system. The type I, class 1 cloth shall consist of 2-ply yarn in both the warp and filling. The type I, class 2 cloth shall consist of 2-ply yarn in the warp and singles yarn in the filling (see 4.2.4). The type I finished cloth shall contain not less than 95 percent wool based on the dry weight of the specimen when tested as specified in 4.2.4.

- \* 3.2.2.2 Polyester-wool blend yarn, for type III. The polyester fiber and wool fiber shall be blended and spun into a 2-ply yarn for both warp and filling for classes 1, 2, and 3, and into a 3-ply yarn for both warp and filling for class 4. As an alternate, the class 2 cloth may be woven with a singles yarn for both warp and filling (see 4.2.4 and 6.6). The use of laps, noils, or any other wool manufacturing by-products and polyester fiber waste is prohibited (see 4.2.2). The finished cloth shall consist of the following fiber percentages based on the dry chloroform-extracted specimen when tested as specified in 4.2.4.

	Percentage	
	Minimum	Maximum
Polyester fiber	55	60
Wool fiber, 64's U.S. Standard (or finer)	40	--

- \* 3.2.2.3 Selvage yarn. To prevent edges of all types of cloth from building-up when rolled, 2-ply yarns (type I, classes 1 and 2 and type III, classes 1, 2, and 3) or 3-ply yarns (type III, class 4) used in the selvage may be made of a finer count than those used in the body of the cloth.

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3.3 Color. The color shall be as specified (see 6.2 and 6.4) and shall match the standard sample. The color of type I cloth shall be obtained by blending stock or top dyed wools; the color of type III shall be obtained by blending top dyed wool with stock, top or tow dyed polyester fibers with the wool and polyester fibers dyed separately and then blended (see 6.5). Pigmented fibers may be used on type III cloth in lieu of dyed, provided that the resultant blend will have appearance characteristics equal to or better than that of the standard sample. Type III, class 2 may also be obtained by piece dyeing. Monotone shades regardless of blend composition shall present a solid appearance with no more heatheriness than is displayed by the standard sample. When the Marine Corps Green 2241 for type III is specified (see 6.4), the cloth shall be produced by blending white stock with color stock to obtain the shade and heathery effect shown by the standard sample.

3.3.1 Mothproofing. Mothproofing of the wool material in accordance with MIL-C-43665 shall be accomplished during stock, top, or piece dyeing as applicable (see 4.2.4).

\* 3.3.2 Matching. The color and shade shall match the standard sample when viewed under filtered tungsten lamps that approximate artificial daylight and that have a correlated color temperature of  $7500 \pm 200\text{K}$ , with illumination of  $100 \pm 20$  foot candles. The color shall be a good match to the standard sample under incandescent lamplight at  $2300 \pm 200\text{K}$ .

\* 3.3.3 Colorfastness. The finished cloth shall show fastness to wet drycleaning, perspiration, and light equal to or better than the standard sample or equal to or better than a rating of "good". 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, except that for Army and Navy Black 439 and for Air Force Blue 1083, the AATCC Chromatic Transference Scale rating shall not be lower than 3.0. In the case of type III, classes 3 and 4, Air Force Blue 1608, and type III, class 3, Navy shade Blue 3346, when no standard sample has been established or designated as applicable to colorfastness to light, the finished cloth shall show "good" fastness to light after 80 standard fading hours. Testing shall be as specified in 4.2.4.

\* 3.4 Physical requirements. The finished cloth shall conform to the requirements specified in table I when tested as specified in 4.2.4.

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TABLE I. Physical requirements

Type	Class	Weight per linear yard on a 56 inch width basis ounces	Yarns per inch (minimum)		Breaking strength minimum (pounds)		Shrinkage percent (maximum)		Weave
			Warp	Filling	Warp	Filling	Warp	Filling	
I	1	10.5 ( $\pm 0.5$ )	50	46	55	50	4.0	3.0	Plain
I	2	9.5 (min)	48	46	50	40	4.0	3.0	Plain
II*	1	9.0 ( $\pm 0.5$ )	54	42	100	80	2.5	2.0	Plain
III	2	7.7 (min)	55	48	70	65	4.0	3.0	Plain
III	3	10.0 ( $\pm 0.5$ )	50	44	100	80	2.5	2.0	Plain
III	4	10.25 ( $\pm 0.5$ )	50	44	100	80	2.5	2.0	Plain

\* 3.4.1 Width. Unless otherwise specified (see 6.2), the width for type I, classes 1 and 2 and type III, classes 1, 3, and 4 shall be no less than 60 inches exclusive of selvages and for type III, class 2 shall be no less than 64 inches exclusive of selvages.

3.5 Finish. The cloth shall be scoured, lightly full, brushed, sheared, pressed, and decatized so as to provide a finish equal to that of the standard sample. The finished cloth shall show no more creping after shrinkage test than exhibited by the standard sample (see 6.3). The finished cloth for type III shall not show wrinkling to a degree greater than as shown by the standard sample after one dry cleaning. Testing shall be as specified in 4.2.4.

3.5.1 Pilling. The type III cloth shall be processed to show no more pilling than the standard sample when tested as specified in 4.2.4.

3.5.2 pH. The pH value of the water extract of the finished cloth shall be no less than 5.5 nor more than 8.5 when tested as specified in 4.2.4.

3.6 Selvages. The selvages shall be so constructed that in the finished cloth they shall lie flat when the material is laid out for cutting.

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3.7 Length and put-up. Unless otherwise specified (see 6.2), the cloth shall be furnished in continuous lengths each not less than 50 yards. Each length shall be put-up on full-width rolls as specified in 5.1.

3.8 Wool content label. The cloth shall be labeled in accordance with the Wool Products Labeling Act.

3.9 Marking. The back of the cloth shall be marked "BACK" at both ends of each roll with letters not less than 1/2 inch in height. The marking shall be clearly legible in any indelible marking medium used commercially.

3.10 Workmanship. The finished cloth shall conform to the quality of product established by this document. The demerit points per 100 square yards when calculated as specified in section 4 shall not exceed the established maximum acceptable point value. Each defect shall be marked with a 1 to 1 1/2-inch long string. The string shall be sewn into the selvage near the defect. A red string shall represent a three or four point defect and a white string shall represent a one or two point defect.

#### 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.

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 Quality of conformance inspection. Unless otherwise specified, sampling for inspection shall be performed in accordance with MIL-STD-105.

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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 documents unless otherwise excluded, amended, modified, or qualified in this document or applicable purchase document.

4.2.1.1 Polyester fiber certification. Polyester fiber shall be accepted on the basis of a contractor's certificate of compliance with the requirements specified in 3.2.1.2.

4.2.2 In-process inspection. Inspection shall be made at any point or during any phase of the manufacturing process to assure that no laps, noils, or any other wool manufacturing by-products are used (see 3.2.1.1 and 3.2.2.2), and that the dyeing requirements have been adhered to (see 3.3). The Government reserves the right to exclude from consideration for acceptance any material for which in-process inspection has indicated nonconformance.

4.2.3 End item examination.

- \* 4.2.3.1 Yard-by-yard examination. The yard-by-yard examination shall be as specified in MIL-STD-655 except that the through-lighting inspection procedures shall not apply to the type III, class 2 cloth. The fabric quality for all shades except Khaki 3729 shall be quality level 12. For Khaki 3729 the fabric quality shall be quality level 15.

4.2.3.1.1 Limits of slubs and knots. Only slubs and knots which exceed "D" or 3 1/2 as applicable, for slubs and "C" for knots on the Sears Fabric Defect Scale (see 6.7) shall be scored.

4.2.3.2 Examination for length. The examination for length shall be as specified in MIL-STD-655.

4.2.3.3 Examination for back marking and compliance with the Wool Products Labeling Act. The examination for back marking and compliance with the Wool Products Labeling Act shall be as specified in MIL-STD-655.

4.2.3.4 Examination for shade and appearance, individual rolls. A sample from each roll in the lot shall be examined visually for shade (see 3.3.2) and appearance (see 3.5). The sample shall be a 4 inch by 20 inch swatch of the cloth. A sample shall be drawn from each roll in the lot. A roll shall be unacceptable if the sample fails to meet the requirements for shade or appearance.

4.2.3.5 Examination for defect marking (stringing of defects). The examination for defect marking (stringing of defects) shall be as specified in MIL-STD-655.



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- \* 4.2.4 End item testing. The cloth shall be tested for the applicable characteristics indicated in table II. The methods of testing specified in FED-STD-191, wherever applicable and as listed in table II 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 4 1/2 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. All test reports shall contain the individual values utilized in expressing the final result. The sample size shall be in accordance with the following:

<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 II. End item tests

<u>Characteristic</u>	<u>Requirement paragraph</u>	<u>Test method</u>
Wool grade	3.2.1.1	4.3.1 and ASTM D 2130
Yarn, single or ply:		
Type I	3.2.2.1	Visual
Type III	3.2.2.2	Visual
Fiber percentage:		
Type I	3.2.2.1	2101
Type III	3.2.2.2	2102
Mothproofing content	3.3.1	1/
Colorfastness:		
Wet drycleaning	3.3.3	5622
Crocking	3.3.3	5651
Perspiration	3.3.3	5680
Light	3.3.3	5660

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TABLE II. End item tests - Continued

Characteristic	Requirement paragraph	Test method
Weight	3.4	5041
Yarns per inch	3.4	5050
Breaking strength	3.4	5100
Shrinkage	3.4	5558
Weave	3.4	Visual <u>2/</u>
Creping after shrinkage	3.5	Visual <u>3/</u>
Wrinkle recovery, type III	3.5	<u>4/</u>
Pilling, type III	3.5.1	5320 <u>5/</u>
pH	3.5.2	2811

1/ As specified in MIL-C-43665.

2/ One determination per sample unit and the results reported as "pass" or "fail."

3 Each shrinkage test specimen shall be visually examined for creping and the results reported as "pass" or "fail". Failure of any one of the test specimens shall be cause for rejection.

4/ Wrinkle recovery. The specimens shall be drycleaned in accordance with Method 5580 of FED-STD-191, except that the specimens shall not be marked and evaluated for shrinkage and shall not be pressed. Wrinkle recovery shall be evaluated in accordance with AATCC Method 128.

5/ The pilling test shall be conducted in accordance with Method 5320, except that five specimens of the test cloth and one specimen of the standard sample shall be used concurrently.

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4.2.5 Packaging inspection. The inspection shall be in accordance with the quality assurance provisions of PPP-P-1132.

4.3 Methods of inspection.

4.3.1 Wool grade test. The wool fibers in the dyed cloth shall be stripped of dye in accordance with the following procedure prior to wool grade determination. Only one sample unit shall be stripped and tested for wool grade regardless of lot size. Two specimens shall be selected from the sample unit. Each specimen shall consist of warp and filling yarns and each shall be approximately 3 inches in the filling direction and of sufficient length in the warp direction to weigh  $5.0 \pm 0.5$  grams. Specimens shall be taken from areas at least 2 inches from the selvages and shall not contain the same warp or filling yarns.

4.3.1.1 Apparatus. The equipment to be used is the launderometer and the canisters described in FED-STD-191 - Method 5614.

4.3.1.2 Reagents.

a. Stripping chemicals: The stripping chemicals shall be zinc (Zn) or sodium (Na) sulfoxylated formaldehyde.

b. Buffering agent: Acetic acid.

4.3.1.3 Procedure: Place 1 gram of the stripping chemical in each of two containers, add 400 ml of distilled water to each and adjust pH to 3.0 to 3.5 with acetic acid. Add a 5 gram fabric sample to each container. Place the containers in the launderometer and rotate until the temperature reaches  $208^{\circ} \pm 3^{\circ}\text{F}$ . After the temperature of  $208^{\circ} \pm 3^{\circ}\text{F}$  has been reached, continue rotation for another 30 minutes. When the cycle has ended, remove the fabric, rinse with warm water ( $120^{\circ}\text{F}$ ) for 5 minutes and then cold water for 5 minutes. Air dry on a flat surface under ambient conditions. Each stripped specimen shall be reduced in size to 2 inches by 2 inches and tested for wool grade in accordance with ASTM D 2130. The lot shall be rejected if any specimen fails to meet the specified grade.

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. The cloth shall be put-up and preserved in accordance with the applicable requirements of PPP-P-1132.

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

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5.2.1 Levels A, B, and Commercial. The cloth shall be packed in accordance with the applicable requirements of PPP-P-1132.

5.3 Marking. In addition to any special marking required in the contract or purchase order, shipments shall be marked in accordance with the applicable requirements of PPP-P-1132.

## 6. .NOTES

6.1 Intended use. Type I, class 2 and type III, class 2 cloths are used for neckties. Type I, class 1, and type III, classes 1, 3, and 4 cloths are intended for use in the manufacturing of shirts, coats, and trousers for officers and enlisted personnel of the Department of Defense.

6.2 Ordering data. Acquisition documents should specify the following:

- a. Title, number, and date of this document.
- b. Type, class, and nomenclature of cloth required (see 1.2).
- c. Color required (see 3.3).
- d. Width of cloth, if other than 60 or 64 inch width is required (see 3.4.1).
- e. Minimum length if other than specified (see 3.7).
- f. Selection of applicable levels of put-up, preservation, and packing (see 5.1 and 5.2).

6.3 Standard sample. For access to samples, address the contracting activity issuing the invitation for bids.

\* 6.4 Suggested dyestuff formulations. Suggested but not mandatory dyestuff formulations for Army Green 44, Army Blue 150, Army Blue 151, Army Green 344, Navy Khaki 3729, Army Blue 450, Army Blue 451, Marine Corps Green 2241, Navy Shade Blue 3346 and Army Black 439 are as follows:

a. All wool - Army Green 44

Acid Green 58  
Acid Green 70  
Acid Orange 85  
Acid Orange 86

The ratio of Acid Green 58 to Acid Green 70 shall be approximately 1 to 1.

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b. All wool - Army Blue 150

Slate Primary:

Mordant Blue 9, CI 14855  
Mordant Blue 13, CI 16680  
Acid Black 48, CI 65005

Red - Blue Primary:

Mordant Blue 9, CI 14855  
Mordant Blue 13, CI 16680  
Mordant Orange 8  
Acid Black 48, CI 65005

Blue Primary:

Mordant Blue 13, CI 16680  
Acid Black 48, CI 65005

c. All wool - Army Blue 151

Red Primary:

Acid Blue 80, CI 61585  
Acid Blue 81, CI 64515  
Mordant Red 7, CI 18760  
Mordant Orange 8

Blue Primary:

Acid Blue 80, CI 61585  
Mordant Blue 7, CI 17940  
Mordant Blue 13, CI 16680

Green Primary:

Sol. Vat Blue 1, CI 73002  
Sol. Vat Violet 2, CI 73386

d. Wool-Polyester - Army Green 344

Wool Components

Acid Green 58  
Acid Green 70  
Acid Orange 85  
Acid Orange 86

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Polyester Components

Disperse Blue 62		Disperse Blue 27, CI 60767
Disperse Yellow 23, CI 26070		Disperse Yellow 23, CI 26070
Disperse Red 59	or	Disperse Red 4, CI 60755
Disperse Violet 18		Disperse Yellow 42, CI 10338

The ratio of Acid Green 58 to Acid Green 70 shall be approximately 1 to 1.

e. All Wool - Navy Khaki 3729

Acid Yellow 128  
Neutral Premetallized Olive Green B  
Acid Brown 45  
Acid Red 182

f. Wool-Polyester - Navy Khaki 3729

Wool Components

Acid Yellow 128  
Neutral Premetallized Olive Green B  
Acid Brown 45  
Acid Red 182

Polyester Components

Disperse Yellow 23, CI 26070  
Disperse Blue 64  
Disperse Blue GR  
Disperse Red 4, CI 60755

g. Wool-Polyester - Army Blue 450

Wool Components

Slate Primary:

Mordant Blue 9, CI 14855  
Mordant Blue 13, CI 16680  
Acid Black 48, CI 65005

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Red-Blue Primary:

Mordant Blue 9, CI 14855  
Mordant Blue 13, CI 16680  
Acid Black 48, CI 65005  
Mordant Orange 8

Blue Primary:

Mordant Blue 13, CI 16680  
Acid Black 48, CI 65005

Polyester Components

Disperse Developed Black DC  
Disperse Developed Blue 3R Conc.  
Disperse Developed Blue BL  
Disperse Developed Orange 3, CI 11005

h. All Wool - Army Blue 451

Red Primary:

Acid Blue 80, CI 61585  
Acid Blue 81, CI 64515  
Mordant Red 7, CI 18760  
Mordant Orange 8

1. Wool-Polyester - Army Blue 451

Wool Components

Blue Primary:

Acid Blue 80, CI 61585  
Mordant Blue 7, CI 17940  
Mordant Blue 13, CI 16680

Green Primary:

Sol. Vat Blue 1, CI 73002  
Sol. Vat Violet 2, CI 73386

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Polyester Components

Disperse Blue 59  
Disperse Blue 63  
Disperse Blue 60  
Disperse Orange 21

j. Wool-Polyester - Marine Corps Green 2241

Wool Components

Yellow Primary:

Acid Black 40  
Acid Red 182  
Acid Yellow 129

Green Primary:

Acid Black 40  
Acid Yellow 129

Brown Primary:

Acid Black 40  
Acid Brown 182  
Acid Yellow 129  
Acid Brown 45

Polyester Components

Disperse Blue 3GL  
Disperse Violet 22  
Disperse Brown 3RL  
Disperse Yellow 23, CI 26070

k. Wool-Polyester - Navy Shade Blue 3346

Wool Components

Mordant Black 9, CI 16500  
Mordant Red 27  
Mordant Blue 7, CI 17940



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### Polyester Components

Solution Dyed Black Polyester Topped with Developer  
AS-BG, Azoic Coupling Compound 19

Fast Black 3B Base  
Disperse Red 59

#### 1. Wool-Polyester - Army Black 439

##### Wool Components

Mordant Black 11  
Mordant Yellow 20

##### Polyester Components

Disperse Developed Black DC  
Disperse Yellow 23, CI 26070

6.5 Effect of dyeing wool and synthetic fibers simultaneously. The dyeing of the wool and the synthetic fibers together in a single operation is undesirable because of the tendency to lower colorfastness and the chance that the degree of colorfastness exhibited by the standard sample cannot be met (see 3.3).

#### 6.6 Notes of caution to manufacturers.

6.6.1 Polyester fiber type. The choice of the polyester fiber type should be made by the contractor for a minimum pilling tendency and the fiber which will meet the colorfastness level of the document (see 3.2.1.2).

6.6.2 Fiber length. The longest staple length commensurate with the staple of the wool, with proper twist multipliers to prevent pilling, should be used in the manufacture of this cloth (see 3.2.1.2).

6.6.3 Twist in the yarns. The twist in the yarns for both the singles and the ply shall be such that the polyester fibers shall be so locked within the yarn structure that migration in subsequent processing and in the weaving of the cloth will not form pills (see 3.2.2.2).

6.6.4 Type III, class 3. The requirements for fulling of the cloth and the balanced construction have been found to be essential to provide a cloth that will perform without substantial wrinkling and mussing in wear. Strict conformance to the fulling requirement is considered to be essential to adequate performance of the cloth.

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6.7 Fabric defect scales. Fabric Defect Replica Kits are available from Sears Roebuck and Company, Department 817, (ATTN: BSC 23-29), Sears Tower, Chicago, IL 60684.

6.8 Supply source. Parolite has been found to be an acceptable stripping chemical. It is available from Henkel Process Chemicals, Inc., 350 Mount Kemble Avenue, Morristown, NY 07960.

\* 6.9 Subject term (key word) listing.

Cloth, tropical wool, polyester/wool  
Clothing, officers and enlisted personnel  
Neckties

6.10 Changes from previous issue. The margins of this document are marked with an asterisk (\*) to indicate where changes (additions, modifications, corrections, deletions) from the previous issue were made. This was done as a convenience only, and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content, as written, irrespective of the marginal notations and relationship to the last previous issue.

Custodians:

Army - GL  
Navy - NU  
Air Force - 11

Preparing activity:

Army - GL  
Project No. 8305-0189

Review activities:

Army - MD  
Navy - MC  
Air Force - 82, 99  
DLA - CT

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## STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

(See Instructions - Reverse Side)

1 DOCUMENT NUMBER MIL-C-21115K		2 DOCUMENT TITLE Cloth, Tropical: Wool, Polyester/Wool	
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)	