

INCH-POUND

MIL-C-29404A(MC)

31 OCTOBER 1990

SUPERSEDING

MIL-C-29404(MC)

11 May 1983

## MILITARY SPECIFICATION

## CLOTH, TROPICAL: POLYESTER AND WOOL

This specification is approved for use by the U. S. Marine Corps, Department of the Navy, and is available for use by all Departments and Agencies of the Department of Defense.

## 1. SCOPE

1.1 Scope. This specification covers the requirements for a polyester and wool tropical cloth, washable and in top dye and piece dye fabrics.

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

Type I Top Dye 75/25 Polyester/Wool Shade 2122  
Type II Piece Dye 80/20 Polyester/Wool Shade 2130

## 2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications and standards. The following specifications and standards form a part of this specification 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 (see 2.4).

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to the Commanding General (PSE-C), Marine Corps Research, Development, and Acquisition Command, Washington, DC 20380, 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 8465

DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

MIL-C-29404A(MC)

SPECIFICATION

FEDERAL

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

MILITARY

MIL-L-35078 - Loads, Unit; Preparation of Semiperishable Subsistence Items; Clothing, Personal Equipment and Equipage; General Specification for

STANDARDS

FEDERAL

FED-STD-191 - Textile Test Methods

MILITARY

MIL-STD-129 - Marking for Shipment and Storage

MIL-STD-147 - Palletized Unit Load

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

(Unless otherwise indicated, copies of federal and military specifications and standards are available from the Standardization Documents Order Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.)

2.1.2 Other Government documents and publications. The following nongovernment documents and publications form a part of this specification to the extent specified herein. Unless otherwise specified, the issue shall be those in effect on the date of the solicitation.

U.S. DEPARTMENT OF AGRICULTURE  
Methods of Test for Grades of Wool Top

(Application for copies should be addressed to the U.S. Department of Agriculture, Agricultural Marketing Service, Washington, DC 20402.)

Rules and Regulations Under the Wool Products Labeling Act 1939

(Application for copies should be addressed to the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.)

2.2 Order of precedence. In the event of a conflict between the

## MIL-C-29404A(MC)

text of this specification and the references cited herein, the text of this specification shall take precedence. Nothing in this document, however, supersedes applicabled 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 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 (see 6.2), the contractor shall furnish sample cloth for first article inspection and approval

3.3 Material. It is encouraged that recycled material be used when practical as long as it meets the requirements of this specification.

3.3.1 Fiber.

3.3.1.1 Wool. The stock shall be fleece of pulled wool or both, not lower in grade than 62's U.S. Standard for the piece dye and not lower than 64's U.S. Standard for the top dye when tested as specified in 4.4.1.1.

3.3.1.2 Polyester. The stock shall be semidull polyester fiber made from polyethylene glycol terephthalate, either homopolymer or modified polymer as appropriate. The fiber shall be three denier and the minimum average fiber length shall be three inches when tested as specified in 4.4.1.

3 3.2 Polyester/Wool yarn. The polyester and wool fibers shall be blended and spun on the worsted system for both warp and filling yarns. The yarns shall be singles in both warp and filling. The finished cloth shall contain the following fiber percentages, based on the oven-dry weight, when tested as specified in 4.5.

- a. Top dyed cloth - 75 percent polyester, 25 ± 3 percent wool
- b. Piece dyed cloth - 80 percent polyester, 20 +3 percent wool

3.3.3 Color. The color of the cloth shall be khaki 2122 for type I and 2130 for type II and shall match the standard sample (see 6.3). The type I color shall be obtained by top dyeing and type II color shall be obtained by piece dyeing.

3.3.3.1 Matching. The color of the finished cloth shall match

## MIL-C-29404A(MC)

the standard sample for type I or type II under artificial daylight having a color temperature of 7500 degrees Kelvin and shall be a good approximation to the standard sample for type I or type II under incandescent lamplight at 2800 degrees Kelvin.

3.3.3.2 Colorfastness. The finished cloth shall show colorfastness to laundering, wet drycleaning, perspiration, light and crocking equal to or better than the standard sample. When no standard sample is available, the finished cloth shall show "good" colorfastness to laundering, wet drycleaning, perspiration, crocking and light. Testing shall be as specified in 4.5.

### 3.4 Design and construction.

3.4.1 Physical requirements. The finished cloth shall conform to the requirements specified in Table I when tested as specified in 4.5.

Table I. Physical Requirements

<u>Yarns per inch</u>		<u>Breaking strength</u>		<u>Shrinkage percent</u>		<u>Weave</u>
<u>(minimum)</u>		<u>(minimum pounds)</u>		<u>(maximum)</u>		
<u>Warp</u>	<u>Filling</u>	<u>Warp</u>	<u>Filling</u>	<u>Warp</u>	<u>Filling</u>	
65	59	100	80	2.5	2.5	Plain (1X1)

1/ The maximum shrinkage shall be determined after three complete launderings (after three complete wash and dry cycles)

3.5 Length and put up. Unless otherwise specified (see 6.2), the cloth shall be furnished in continuous lengths, each not less than 50 yards, and shall be put up on full width rolls as specified in PPP-P-1132.

3.6 Width. Unless otherwise specified (see 6.2), the width of the finished cloth shall be a minimum of 60 inches exclusive of selvages.

3.7 Weight of cloth. The weight per linear yard of the finished cloth, on a 56 inch width basis, shall be as follows:

<u>Piece dyed cloth</u>		<u>Top dyed cloth</u>	
<u>Ounces</u>		<u>Ounces</u>	
<u>Minimum</u>	<u>Maximum</u>	<u>Minimum</u>	<u>Maximum</u>
6.5	7.0	6.3	6.8

3.8 Finish. The cloth shall be scoured, heat set, sheared and decatized so as to provide a finish equal to that of the standard sample for the applicable type being procured.

3.8.1 Pilling. The finished cloth shall show no more pilling

## MIL-C-29404A(MC)

than that of the standard sample when tested as specified in 4.5.

3.8.2 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 4.5.

3.8.3 Selvages. The selvages shall be no thicker than 65 percent more than the body cloth when tested as specified in 4.5, and shall lie flat when the material is laid out for cutting.

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 (see 4.4.3.3). The marking shall be clearly legible in any indelible marking used commercially.

3.9.1 Wool content label. Cloth manufactured under this specification shall be labeled in accordance with the Wool Products Labeling Act of 1939.

3.10 Workmanship. The finished cloth shall conform to the quality established by this specification. The demerit points per 100 square yards when calculated as specified in Section 4, shall not exceed the established maximum 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 (examinations and tests) 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 the specification 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 specification shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in the specification 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 inspection, as part of

## MIL-C-29404A(MC)

manufacturing operations, is an acceptable practice to ascertain conformance to requirements, however, this 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 Certificate of compliance. Where certificates of compliance are permitted, the Government reserves the right to check test such items to determine the validity of the certification.

4.2 Classification of inspection. 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 required, the first article shall be visually examined for color, finish and appearance and shall be tested for chemical and physical properties in accordance with the applicable methods specified in 4.4.2.

4.4 Quality conformance inspection. Sampling for inspection shall be performed in accordance with MIL-STD-655 except where otherwise indicated herein.

4.4.1 Component and material inspection. In accordance with 4.1 above, components and materials shall be inspected in accordance with all the requirements of referenced specification, drawings and standards unless otherwise excluded, amended, modified, or qualified in this specification or applicable purchase document. The polyester fiber shall be tested and identified as specified in Table II.

TABLE II Component Tests

Characteristic	Requirement paragraph	Test methods
Polyester identification	3.2.1.2	1/
Length of fiber	3.2.1.2	Visual 1/
Denier	3.2.1.3	4021 1/

1/ A certificate of compliance shall be submitted and will be acceptable for the stated requirements.

4.4.1.1 Wool. The wool shall be visually examined for grade (see 3.3.1.1.) in the undyed top form by comparison with Methods of Test for Grades of Top Wool. In the event of a dispute, the wool grade shall be determined by the width method (wedge). The sample unit shall be 1 yard of undyed top. The sample size (number of sample units) shall be as shown below. The lot size shall be

## MIL-C-29404A(MC)

expressed in units of 1 pound. The results from each sample unit shall be reported separately. The lot shall be unacceptable if a single sample unit fails to meet the required grade.

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

4.4.1.2 In-process inspection. Inspection shall be made at any point or during any phase of the manufacturing process to assure that supplies and services conform to prescribed requirements. The Government reserves the right to exclude from consideration for acceptance any material for which the in-process inspection has indicated nonconformance.

4.4.2 Examination of the end item. Examination of the end item shall be in accordance with 4.4.2.1 through 4.4.2.5.

4.4.2.1 Yard-by-yard 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. The sample size shall be in accordance with the following.

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

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

4.4.3.3 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.

4.4.3.4 Examination for shade and finish individual rolls. Each roll in the lot shall be examined visually for shade match see (3.3.3) and finish (see 3.8). A roll shall be unacceptable if it fails to meet the requirements for shade match and finish. The sample unit shall be a four inch by 20 inch swatch of the cloth. A sample unit shall be drawn from each roll in the lot.

1/ No more than one roll shall be taken from any shipping container unless the number of shipping containers in the lot is

## MIL-C-29404A(MC)

less than the required number of rolls in which all shipping containers shall be present in the sample.

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

4.5 Tests. The methods of testing specified in FED-STD-191, wherever applicable, and as listed in Table III shall be followed. The physical and chemical values specified in Section 3 apply to the results of the determinations made on a sample for test purposes as specified in the applicable test methods. The sample unit shall be four continuous yards full width of the finished cloth. The lot size shall be expressed in units of one yard. 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 (number of sample units) shall be in accordance with the following:

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

Table III. Test methods

<u>Characteristic</u>	<u>Requirement</u>	<u>Test Method</u>
Yarn		
Warp	3.3.2	Visual <u>1/</u>
Filling	3.3.2	Visual <u>1/</u>
Fiber content (percent)	3.3.2	
	Type I      Type II	2102
Polyester $\pm$ 3percent	75            80	
Wool $\pm$ 3percent	25            20	
Yarn ply		
Warp	Single	Visual 2/
Filling	Single	Visual 2/
Weight, linear yd, 56 inch width		
Type I	6.3 - 6.8	ASTM D 3776 3/
Type II	6.5 - 7.0	ASTM D 3776 3/
Yarns per inch (minimum)		
Warp	65	5050



## MIL-C-29404A(MC)

Table III. Test methods

<u>Characteristic</u>	<u>Requirement</u>	<u>Test Method</u>
Filling	59	5050
Breaking strength (minimum) pounds		
Warp	100	ASTM D 1682 3/
Filling	80	ASTM D 1682 3/
Shrinkage percent (maximum)		
Warp	3.4.1	5558
Filling	3.4.1	5558
Weave	Plain	Visual
Colorfastness:	Equal to standard or:	
Wet-dry cleaning	Good	5622
Crocking (minimum)	3.3.3.2	5610
Perspiration	Good	5680
Light	Good	5660
pH	5.5 - 8.5	2811
Pilling	Equal to standard sample	5320 4/
Selvage thickness	3.8.3	5030

1/ The test methods indicated have been found acceptable to determine if the cloth meets the stated requirements. If the Government requires proof that the cloth meets the stated requirements, the test method indicated shall be used.

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

3/ Refers to American Society for Testing of Materials (ASTM).

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

4.6 Examination of packaging requirements. Examination shall be made in accordance with the provisions PPP-P-1132, to determine that packaging, packing and marking complies with Section five requirements.

## 5. PACKAGING

5.1 Put up and packaging. Put-up and packaging shall be level A or commercial as specified (see 6.2).

## MIL-C-29404A(MC)

5.1.1 Level A and Commercial. The cloth shall be put up and packaged in accordance with the applicable requirements of PPP-P-1132 except the moth repellent requirements shall not apply.

5.2 Packing. Packing shall be level A or commercial as specified (see 6.2).

5.2.1 Level A 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 by the contract or purchase order, shipments shall be marked in accordance with MIL-STD-129.

## 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 cloth covered by this specification is intended for use in the manufacture of shirts and neck ties for male personnel and shirts for female personnel of the U.S. Marine Corps.

6.2 Acquisition requirements. Acquisition documents must specify the following:

- a. Title, number, and date of this specification.
- b. Type and weight of cloth required. If the cloth is type I, specify number and texture (see 1.2 and 3.7).
- c. When first article is required (see 3.1).
- d. Length and put up if other than specified (see 3.5).
- e. Width if other than specified (see 3.6).
- f. Applicable levels of put-up, packaging, and packing (see 5.1 and 5.2).

6.3 Standard sample. For access to standard sample, address the procuring 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 also include specific instructions in acquisition documents regarding arrangements for selection, inspection, and approval of the first article.

6.5 Acceptance criteria. The quality level of this cloth is 20

MIL-C-29404A(MC)

when inspected in accordance with MIL-STD-655. The lot shall be unacceptable if the points per 100 yards of the total yardage examined exceeds 20 points. The lot shall be unacceptable if the points per 100 square yards of two or more individual rolls exceeds 33 points.

6.6 Subject term (key word) listing

Textile  
Blended fiber  
Fabric

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

Preparing Activity:  
Navy - MC  
Project No. 8305N330

## STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

## INSTRUCTIONS

1. The preparing activity must complete blocks 1, 2, 3, and 8. In block 1, both the document number and revision letter should be given.
2. The submitter of this form must complete blocks 4, 5, 6, and 7.
3. The preparing activity must provide a reply within 30 days from receipt of the form.

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

## I RECOMMEND A CHANGE:

1. DOCUMENT NUMBER

MIL-C-29404A(MC)

2. DOCUMENT DATE (YYMMDD)

31 OCTOBER 1990

## 3. DOCUMENT TITLE

CLOTH, TROPICAL: POLYESTER AND WOOL

## 4. NATURE OF CHANGE (Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.)

## 5. REASON FOR RECOMMENDATION

## SUBMITTER

a. NAME (Last, First, Middle Initial)

b. ORGANIZATION

c. ADDRESS (Include Zip Code)

d. TELEPHONE (Include Area Code)

(1) Commercial

(2) AUTOVON

(if applicable)

7. DATE SUBMITTED

(YYMMDD)

## 3. PREPARING ACTIVITY

a. NAME

Commanding General, Marine Corps Research,  
Development, and Acquisition Command (PSE-C)

b. TELEPHONE (Include Area Code)

(1) Commercial

(2) AUTOVON

(202) 696-1186/87/88

226-1186/87/88

c. ADDRESS (Include Zip Code)

Washington, DC 20380-0001

IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT:

Defense Quality and Standardization Office

5203 Leesburg Pike, Suite 1403, Falls Church, VA 22041-3466

Telephone (703) 756-2340 AUTOVON 289-2340