

MIL-C-3727F  
18 December 1987  
SUPERSEDING  
MIL-C-3727E  
14 August 1975

MILITARY SPECIFICATION

CLOTH, BARATHEA, 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 barathea cloth.

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

Type I - 14 ounce  
Type III - 15 ounce

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 this solicitation.

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 N/A

FSC 8305

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SPECIFICATIONS

FEDERAL

PPP-P-1132 - Packaging and Packing 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-655 - Provisions for Evaluating Quality of Cloth, Wool, Worsted and Wool Blends

(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.)

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, Pennsylvania Avenue at Sixth Street, N.W., Washington, DC 20580 or to the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.)

\* 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.

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AMERICAN ASSOCIATION OF TEXTILE CHEMISTS AND COLORISTS (AATCC)

Chromatic Transference Scale

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

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

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

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

(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).
- 3.2 First article. When specified in the contract or purchase order, a sample shall be subjected to first article inspection (see 4.3, 6.2, and 6.7).

3.3 Material.

3.3.1 Wool. The wool for types I and III shall be fleece wool, pulled wool, or both not lower in grade than 70's U.S. Standard, and shall be of suitable staple length to meet the requirements of this document. The use of laps, noils, or any other wool manufacturing by-products is prohibited.

3.3.2 Yarn. The yarn shall be spun from combed top on either the Bradford, French, or American system. The yarn for both warp and filling shall be 2-ply (see 4.4.3).

NOTE: Selvage yarn. To prevent edges of cloth from building up when rolled, two-ply yarns used in the selvage may be made of a finer count than those used in the body of the cloth.

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3.4 Color. The color shall be as specified (see 6.2) and shall match the standard sample (see 6.3). The color shall be produced by blending the proper shades of stock or top dyed wool (see 6.4).

- \* 3.4.1 Matching. The color of the finished cloth shall match the standard sample when viewed under filtered tungsten lamps that approximate artificial daylight and that have a correlated color temperature of  $7500\text{ K} \pm 200\text{ K}$ , with illumination of  $100 \pm 20$  foot candles, and shall be a good match to the standard sample under incandescent lamplight at  $2300 \pm 200\text{ K}$ .
- \* 3.4.2 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. Testing shall be as specified in 4.4.3.

3.4.3 Mothproofing. Mothproofing of the wool material in accordance with MIL-C-43665 shall be accomplished during stock dyeing or top dyeing as applicable.

3.5 Physical requirements. The finished cloth shall conform to the requirements specified in table I when tested as specified in 4.4.3. The weave shall be an 8-harness barathea weave as shown on figure 1.

TABLE I. Physical requirements

Type	Width, minimum (inches) (exclusive of selvage)	Weight, minimum (ounces) (based on linear yard, 56 in. wide)	Yarns per inch, minimum		Breaking strength (pounds), minimum	
			Warp	Filling	Warp	Filling
I	60	14.0	80	86	70	85
III	60	15.0	85	75	125	100

3.6 Finish. The cloth shall be scoured, fulled, and sheared to result in the type and character of finish equal to that shown by the standard sample (see 6.3).

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3.7 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 4.4.3.

3.8 Shrinkage. The finished cloth shall shrink no more than 4.0 percent in the warp direction nor more than 3.5 percent in the filling direction when tested as specified in 4.4.3.

3.9 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 a full-width roll as specified in 5.1.1.

3.10 Wool content. The finished cloth shall contain not less than 95 percent wool based on the dry-weight of the specimen when tested as specified in 4.4.3.

3.11 Fiber identification. Cloth manufactured under this document shall be labeled in accordance with the Wool Products Labeling Act.

3.12 Back identification. 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.

3.13 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 MIL-STD-655 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 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.

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\* 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.

4.2 Classification of inspections. 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 a first article is required (see 6.2), it shall be examined for the defects specified in 4.4.2 and tested for the characteristics specified in 4.4.3. The presence of any defect or failure to pass any test shall be cause for rejection of the first article.

4.4 Quality conformance inspection. Unless otherwise specified, sampling for inspection shall be performed in accordance with MIL-STD-655.

4.4.1 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.

4.4.1.1 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 3.3.1) and that the dyeing requirements have been adhered to (see 3.4). The Government reserves the right to exclude from consideration for acceptance any material for which in-process inspection has indicated non-conformance.

4.4.2 End item examination.

\* 4.4.2.1 Point count examination. Examination of the end item shall be in accordance with the provisions of MIL-STD-655 for fabric quality level 10.

\* 4.4.2.2 Limits of slubs and knots. Only slubs and knots which exceed the limits shown on Sears Fabric Defect Scales (see 6.5), "D" or 3-1/2, as applicable, for slubs and "C" for knots shall be scored.

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- \* 4.4.2.3 Shade match and appearance. A 4-inch by 20-inch swatch shall be drawn from each roll in the lot. Each swatch shall be examined visually for shade match and appearance (see 3.4.1). Any swatch failing to meet the requirements for shade match or appearance shall be cause for rejection of the roll from which it was drawn.
- \* 4.4.3 End item testing. The cloth shall be tested for the characteristics listed in table II. The methods of testing specified in FED-STD-191, whenever 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 3 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 (number of sample units) shall be in accordance with the following:

<u>Lot size (yards)</u>	<u>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>Characteristics</u>	<u>Requirement paragraph</u>	<u>Test method</u>
Wool grade	3.3.1	4.5.1 and ASTM D 2130
Yarn - ply:		
Warp	3.3.2	Visual $\frac{1}{1}$
Filling	3.3.2	Visual $\frac{1}{1}$
Colorfastness to:		
Light	3.4.2	5660
Crocking	3.4.2	5651
Wet dry cleaning	3.4.2	5622
Perspiration	3.4.2	5680

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TABLE II. End item tests - Continued

Characteristics	Requirement paragraph	Test method
Mothproofing content	3.4.3	<u>2/</u>
Weave	3.5	Visual <u>1/</u>
Weight	3.5	5041
Yarns per inch	3.5	5050
Breaking strength	3.5	5100
pH	3.6.1	2811
Shrinkage	3.7	5558
Wool content (finished cloth)	3.9	2101

1/ One determination per sample unit and the result reported as "pass" or "fail".

2/ As specified in MIL-C-43665.

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

\* 4.5 Methods of inspection.

4.5.1 Stripping procedure. 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.



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

4.5.1.2 Reagents.

- a. Stripping chemicals: the stripping chemicals shall be zinc (Zn) (see 6.6) or sodium (Na) sulfoxylated formaldehyde.
- b. Buffering agent: acetic acid.

4.5.1.3 Procedure. Place 1 gram of the stripping chemical in each of two canisters, 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 specimen to each canister. Place the canisters 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 the specimens shall be tested for wool grade in accordance with ASTM D 2130. The lot shall be rejected if either 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, except that the moth repellent requirement shall not apply.

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

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 requirements of PPP-P-1132.

6. NOTES

6.1 Intended use. The cloth is intended for use in the manufacture of uniform items for the Department of Defense.

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6.2 Ordering data. Acquisition documents should specify the following:

- a. Title, number, and date of this document.
- b. Type required (see 1.2).
- c. When a first article is required (see 3.2, 4.3, and 6.7).
- d. Color required (see 3.4).
- e. Minimum length if other than specified (see 3.8).
- 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 Dyestuff formulations. Suggested but not mandatory formulations for shades Army Blue 150 and Army Blue 151 are as follows:

Army Blue 150

Slate primary:

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

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

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

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Green primary:

Sol. Vat Blue 1, CI 73002

Sol. Vat Violet 2, CI 73386

The standards have been dyed with the above formulations.

- \* 6.5 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.
- \* 6.6 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.

6.7 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 include specific instructions in all acquisition instruments regarding arrangements for selection, inspection, and approval of the first article.

- \* 6.8 Subject term (key word) listing.

Barathea  
Cloth  
Uniform  
Wool

6.9 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.

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Custodians:

Army - GL  
Navy - NU  
Air Force - 99

Preparing activity:

Army - GL  
Project No. 8305-0187

Review activities:

Army - MD  
Air Force - 82  
DLA - CT

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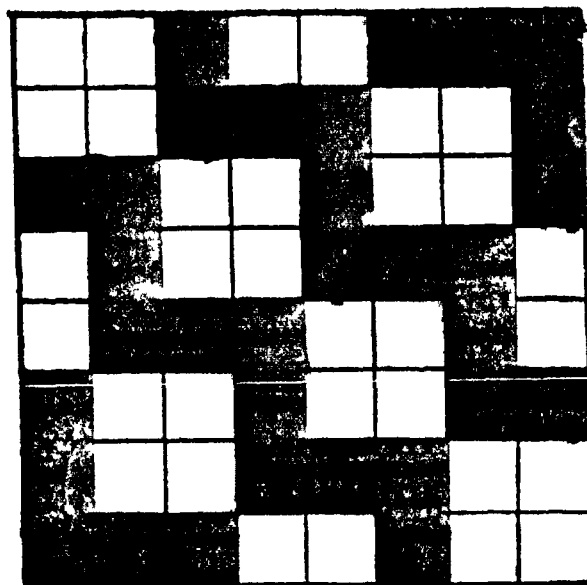


FIGURE 1. Barathean weave.

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### STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

(See Instructions - Reverse Side)

<b>1 DOCUMENT NUMBER</b> MIL-C-3727F	<b>2 DOCUMENT TITLE</b> Cloth, Barathea, Wool
<b>3a. NAME OF SUBMITTING ORGANIZATION</b>  	<b>4 TYPE OF ORGANIZATION (Mark one)</b>  <input type="checkbox"/> VENDOR  <input type="checkbox"/> USER  <input type="checkbox"/> MANUFACTURER  <input type="checkbox"/> OTHER (Specify) _____
<b>b. ADDRESS (Street, City, State ZIP Code)</b>  	
<b>5 PROBLEM AREAS</b> <p>a. Paragraph Number and Wording</p>           <p>b. Recommended Wording</p>           <p>c. Reason/Rationale for Recommendation</p>	
<b>6 REMARKS</b>	
<b>7a. NAME OF SUBMITTER (Last, First, MI) - Optional</b>	<b>b. WORK TELEPHONE NUMBER (Include Area Code) - Optional</b>
<b>c. MAILING ADDRESS (Street, City, State, ZIP Code) - Optional</b>	<b>8. DATE OF SUBMISSION (YYMMDD)</b>