

MIL-C-17238D
19 March 1975
SUPERSEDING
MIL-C-17238C
24 November 1970

MILITARY SPECIFICATION

CLOTH, KNITTED, WOOL AND COTTON FLEECE

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

1. SCOPE

1.1 Scope.- This specification covers the requirements for a wool and cotton fleece knitted cloth.

2. APPLICABLE DOCUMENTS

2.1 The following documents of the issue in effect on date of invitation for bids or request for proposal, form a part of this specification to the extent specified herein.

SPECIFICATIONS

FEDERAL

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

STANDARDS

FEDERAL

FED-STD-191 - Textile Test Methods

MILITARY

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

MIL-STD-1491 - Glossary of Knitting Imperfections

(Copies of specifications, standards, drawings and publications required by suppliers in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

FSC 8305

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LAWS AND REGULATIONS

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

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

RULES AND REGULATIONS UNDER THE WOOL PRODUCTS LABELING ACT OF 1939

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

3. REQUIREMENTS

3.1 Standard sample.- The finished cloth 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 approval.- The requirements for first article will be as specified by the procuring activity (see 6.2).

3.3 Materials.-

3.3.1 Cotton yarn.- The yarn shall be made from cotton which has been cleaned, carded, evenly drawn and spun into singles or two ply yarn.

3.3.2 Wool.-

3.3.2.1 Wool stock.- The stock shall be fleece, or pulled wool or a combination of both, not lower in grade than 50's U.S. Standard (see 4.3.1.1). The use of reprocessed, reused or waste wool is prohibited.

3.3.2.2 Yarn.- The yarn shall be carded and spun into single yarns.

3.4 Knit.- The fleece shall be a knitted cloth with a cotton back and a napped wool face. Two ends of cotton yarns shall be knit as one, and two ends of wool yarns shall tuck as one. All cotton yarns shall appear on the back and all wool yarns on the face.

3.4.1 Fiber content.- The finished cloth shall contain a minimum of 65 percent wool by weight and the remainder shall be cotton. Testing shall be as specified in 4.5.

3.4.2 Color.- The cloth shall be natural color, undyed and unbleached.

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

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Table I - Physical requirements

Weight oz./sq. yd.	Texture		Bursting Strength lb. (min.)	Thickness, inches (min.)	
	Wales/in.	Courses/in.		0.1 psi	1.1 psi
19.0 (+ 1.5)	20.0 (+ 2.0)	20.0 (+ 3.0)	65	0.200	0.120

3.5.1 Elongation.— The finished cloth shall have a maximum of 95 percent elongation in the course direction when tested as specified in 4.5.

3.6 Finish.— The cloth shall be thoroughly scoured (not bleached) and evenly napped to form a disoriented pile on the face to meet the minimum thickness requirement specified in Table I.

3.6.1 pH.— The pH value of the water extract of the finished cloth shall be no less than 5.0 nor more than 8.0 when tested as specified in 4.5.

3.7 Width.— The width of the napped portion of the cloth shall be as specified (see 6.2).

3.8 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 in full width rolls as specified in PPP-P-1132.

3.9 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 occurrence of defects shall not exceed the applicable acceptable quality levels.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection.— Unless otherwise specified in the contract or purchase order, the supplier is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or order, the supplier 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 Certificate of compliance.— Where certificates of compliance are submitted, the Government reserves the right to check test such items to determine the validity of the certification.

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4.2 First article inspection.- When required, the first article of the finished cloth submitted in accordance with 3.2 shall be visually inspected for appearance, color, and finish. The sample shall be tested for physical and chemical properties in accordance with the methods specified in 4.5.

4.3 Inspection.- Sampling for inspection shall be performed in accordance with MIL-STD-105, except where otherwise indicated.

4.3.1 Component and material inspection.- In accordance with 4.1 above, components and materials shall be inspected and tested in accordance with all requirements of referenced specifications, drawings, and standards unless otherwise excluded, amended, modified or qualified in this specification or applicable purchase document.

4.3.1.1 Fleece or pulled wool.- Fleece or pulled wool shall be examined in scoured form prior to picking or carding. The examination for grade shall be performed on a composite sample of 1 pound of this component for each 10,000 pounds or fraction thereof in the lot. The composite sample shall be selected from not less than 10 percent of the bales or bags in the lot. The lot shall be unacceptable if the sample does not conform to the requirements in 3.3.2.

4.3.1.2 In-process inspection.- Inspection shall be made at any point during any phase of the manufacturing process to assure that no reprocessed, reused or waste wool or any other wool manufacturing by-products are used (see 3.3.2.1). The Government reserves the right to exclude from consideration for acceptance any material for which in-process inspection has indicated non-conformance.

4.3.2 Examination of the end item.- Examination of the end item shall be in accordance with 4.3.2.1 through 4.3.2.3.

4.3.2.1 Yard-by-yard examination.- The required yardage of each roll shall be examined on one side only. The side examined, however, shall be alternated so that the alternate rolls are examined on the face and back respectively. Visual defects as defined in MIL-STD-1491 shall be classified as listed below. All defects found shall be counted regardless of their proximity to each other, except where two or more defects represent a single local condition of the cloth, in which case only the more serious defect shall be counted. A continuous defect shall be counted as one defect for each wale-wise (length-wise) yard or fraction thereof in which it occurs. Slight open places resulting from removal of burrs, shives or sisal not previously scored on the napped side shall not be scored as defects. The unit of product for this examination shall be one linear yard. The acceptable quality level (AQL) for this examination shall be 6.5 defects per 100 units (yards). The sample size shall be based upon inspection level II of MIL-STD-105. The lot size shall be expressed in units of one yard each. The number of rolls from which the sample is to be selected shall be in accordance with Table II. An approximately equal number of yards shall be examined in each roll of the sample.

List of defects 1/

Drop stitch or run
 Any hole, cut or tear
 Any mend
 Any bare spots or thin places
 Foreign matter
 Any spot, stain or streak
 Color other than natural
 Crease or wrinkle, embedded

1/ Clearly visible at normal inspection distance, approximately 3 feet.

4.3.2.2 Overall examination.- Each defect listed shall be counted not more than once in each roll examined. The sample unit shall be one roll. The sample size (number of rolls selected as sample) and the acceptance number (maximum number of defects acceptable) shall be as shown in Table II.

Defects

Width - less than minimum or more than maximum specified
 Overall uncleanness
 Unevenly napped
 Density of nap not uniform throughout the surface
 Edges frayed, ravelled, curled, rolled, folded, scalloped
 or uneven continuously or intermittently through the roll

Table II - Sample size

<u>Lot size in yards</u>	<u>Sample size in rolls</u>	<u>Acceptance number</u>
Up to and including 1,200	3	0
1,201 up to and including 3,200	5	0
3,201 up to and including 10,000	7	0
10,001 up to and including 35,000	10	1
35,001 and over	15	2

NOTE: If a lot contains fewer than three rolls, each roll in the lot shall be examined.

4.3.2.3 Examination for length.-

4.3.2.3.1 Individual rolls.- During the yard-by-yard examination, each roll in the sample shall be examined for length. Any length found to be less than the minimum specified or more than two yards less than the length marked on the ticket shall be considered a defect with respect to length. The lot shall be unacceptable if two or more rolls in the sample are defective in respect to length.

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4.3.2.3.2 Total yardage in sample.— The lot shall be unacceptable if the total of the actual lengths of rolls in the sample is less than the total of the lengths marked on roll tickets. The rolls examined shall be those selected for the examination of individual rolls.

4.3.2.4 Examination for compliance with the Wool Products Labeling Act.— During the yard-by-yard examination, each roll in the sample shall be examined for conformance to the Wool Products Labeling Act. Each roll not labeled in accordance with this act shall be scored as a defect. The lot shall be unacceptable if two or more of these defects occur.

4.4 Examination of preparation for delivery requirements.— Examination shall be made in accordance with the provisions of PPP-P-1132 to determine that packaging, packing and marking requirements of Section 5 of this specification are complied with.

4.5 Testing of the end item.— 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 except where otherwise specified apply to the average of the determinations made on the sample unit for testing purposes as specified in the applicable test methods. All test reports shall contain the individual values utilized in expressing the final results. The sample unit for test purposes shall be one yard 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 of the test requirements specified. The sample size 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

4.5.1 Preconditioning.— Prior to the testing, the fleece shall be placed in a tumble type rotary dryer, having a cylindrical basket approximately 30 inches in diameter, 24 inches in length rotating at approximately 35 R.P.M. The dryer shall be provided with a means of maintaining a stack temperature of 140 degrees to 160 degrees F. The sample shall be tumbled at this temperature range for thirty or forty minutes with a twenty to twenty-five pound ballast load. The sample is then conditioned as specified in FED-STD-191. All tests specified herein are based on the fleece in a horizontal relaxed supported state.

Table III - Test methods

<u>Characteristic</u>	<u>Requirement reference</u>	<u>Test method</u>
Material identification		
Cotton	3.3.1	1200 <u>1/</u>
Wool	3.3.2	1100 <u>1/</u>
Fiber content	3.4.1	2101
Knit	3.4	Visual <u>1/</u>
Weight	3.4	5041
Elongation	3.5.1	4.5.2
Wales per inch	3.5	5070
Courses per inch	3.5	5070
Bursting strength	3.5	5120 <u>2/</u>
pH	3.6.1	2811
Thickness	3.5	5030 <u>3/</u>
Color	3.4.2	Visual <u>4/</u>

NOTE: In die-cutting the specimens for test, the napped side of the fabric shall be facing up.

- 1/ A supplier's certificate of compliance shall be accepted for this characteristic.
- 2/ Test shall be performed with napped face down.
- 3/ Five 4 by 4 inch specimens for each load shall be cleanly cut from the fabric. No two specimens shall contain the same walewise or coursewise yarns. The nap shall be facing up and the results shall be the average of 5 readings for each load.
- 4/ One determination per sample unit with results reported as "pass" or "fail."

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4.5.2 Elongation.— Elongation of the fabric shall be measured on an inclined plane type of machine (IP4 or similar type). A suitable autographic recording device shall be provided. Specimens of the fabric shall be cut 4 inches by 6 inches with the long dimension parallel to the course direction. The specimen shall be placed in two sets of flat type clamps which are one inch wide and three inches apart. The clamps which face each other shall be aligned with the wales of the sample. The sample shall be placed in the clamp jaws without tension and without slack. Two number 5 type weights as used in the IP4 type machine shall be placed on the carriage of the inclined plane tester, furthest from the jaws. The machine shall be run for 10 complete cycles, recording the elongation on an autographic chart. Five specimens, each containing different wales and courses, shall be tested from each Unit-of-Product, with individual recorded elongation diagrams. The elongation of the Unit-of-Product shall be the average of the results obtained from the specimens tested, when measured at the peak of the last recorded cycle, in a line perpendicular to the horizontal zero axis. During the test, the inclined plane shall be allowed to proceed to its maximum depression, so as to exert a 15-pound tension.

5. PREPARATION FOR DELIVERY

5.1 Packaging.— Packaging shall be level A or C (see 6.2).

5.1.1 Levels A and C.— The cloth, put up as specified, shall be preserved and packaged in accordance with the applicable requirements of PPP-P-1132.

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

5.2.1 Levels A, B and C.— 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 order, shipments shall be marked in accordance with the requirements of PPP-P-1132.

6. NOTES

6.1 Intended use.— The cloth covered by this specification is intended for use in insulated cold weather boots worn by military personnel of the Department of Defense.

6.2 Ordering data.— Procurement documents should specify the following:

- a. Title, number and date of this specification.
- b. Requirements for first article approval (see 3.2).
- c. Width required (see 3.7).
- d. Minimum length if other than specified (see 3.8).
- e. Selection of applicable levels of packaging and packing (see 5.1 and 5.2).

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6.3 Standard sample.- For access to standard sample, address the procuring activity issuing the invitation for bids.

Custodians:

Navy - SA

Army - GL

Air Force - 11

Preparing activity:

Navy - SA

Project No. 8305-0346

Review activities:

Army - GL, MD

Air Force - 82

SPECIFICATION ANALYSIS SHEET		Form Approved Budget Bureau No. 22-R255
<p>INSTRUCTIONS: This sheet is to be filled out by personnel, either Government or contractor, involved in the use of the specification in procurement of products for ultimate use by the Department of Defense. This sheet is provided for obtaining information on the use of this specification which will insure that suitable products can be procured with a minimum amount of delay and at the least cost. Comments and the return of this form will be appreciated. Fold on lines on reverse side, staple in corner, and send to preparing activity. Comments and suggestions submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or serve to amend contractual requirements</p>		
<p>SPECIFICATION MIL-C-17238D; Cloth, Knitted, Wool and Cotton Fleece</p>		
<p>ORGANIZATION</p>		
<p>CITY AND STATE</p>		<p>CONTRACT NUMBER</p>
<p>MATERIAL PROCURED UNDER A <input type="checkbox"/> DIRECT GOVERNMENT CONTRACT <input type="checkbox"/> SUBCONTRACT</p>		
<p>1. HAS ANY PART OF THE SPECIFICATION CREATED PROBLEMS OR REQUIRED INTERPRETATION IN PROCUREMENT USE? A. GIVE PARAGRAPH NUMBER AND WORDING.</p>		
<p>B. RECOMMENDATIONS FOR CORRECTING THE DEFICIENCIES</p>		
<p>2. COMMENTS ON ANY SPECIFICATION REQUIREMENT CONSIDERED TOO RIGID</p>		
<p>3. IS THE SPECIFICATION RESTRICTIVE? <input type="checkbox"/> YES <input type="checkbox"/> NO (If "yes", in what way?)</p>		
<p>4. REMARKS (Attach any pertinent data which may be of use in improving this specification. If there are additional papers, attach to form and place both in an envelope addressed to preparing activity)</p>		
<p>SUBMITTED BY (Printed or typed name and activity - Optional)</p>		<p>DATE</p>

DD FORM 1426
1 JAN 66

REPLACES EDITION OF 1 OCT 64 WHICH MAY BE USED

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