

MIL-C-6590C(USAF)

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MIL-C-6590B(USAF)

13 November 1968

MILITARY SPECIFICATION

CLOTH, PILE (SYNTHETIC MOUTON, KNITTED)

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 simulated furlike garment material of knitted mouton.

1.2 Classification. The cloth shall be of the following types as specified by the procuring activity:

Type I - 100 percent acrylic, pile fiber.

Type II - 100 percent acrylonitrile copolymer vinyl chloride, pile fiber.

2. APPLICABLE DOCUMENTS

* 2.1 Government documents.

* 2.1.1 Specifications and standards. Unless otherwise specified, the following specifications and standards of the issue listed in that issue of the Department of Defense Index of Specifications and Standards (DoDISS) specified in the solicitation form a part of this specification to the extent specified herein.

SPECIFICATIONS

FEDERAL

PPP-P-1133 Packaging and Packing of Synthetic Fiber Fabrics

STANDARDS

MILITARY

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

MIL-STD-129 Marking for Shipment and Storage

MIL-STD-147 Palletized and Containerized Unit Loads 40 Inch X 48 Inch Pallets, Skids, Runners or Pallet Type Base

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: the Engineering Division, San Antonio Air Logistics Center/MMEDO, Kelly AFB, TX 78241 by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

FSC 8305

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MIL-STD-1491 Glossary of Knitting Imperfections

FEDERAL

FED-STD-191 Textile Test Methods

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

* 2.2 Other publications. The following document (s) form a part of this specification to the extent specified herein. The issues of the documents which are indicated as DoD adopted shall be the issue listed in the current DoDISS and the supplement thereto, if applicable.

Rules and Regulations Under the Textile Fiber Products Identification Act

(Copies may be obtained free of charge from the Federal Trade Commission, Washington, D.C. 20580).

* 2.2.1 Order of precedence. In the event of a conflict between the text of this specification and the references cited herein, the text of this specification shall take precedence.

3. REQUIREMENTS

3.1 Standard sample. Unless otherwise specified, the cloth shall be equal to, or better than the standard sample with respect to all characteristics for which the standard is referenced (see 6.3).

* 3.2 Material.

* 3.2.1 Backing. The backing shall be made from undyed spun fibrillated filamented polypropylene yarn or filamented polypropylene/cotton blend yarn.

* 3.2.1.1 Cotton. The cotton yarn shall be thoroughly cleaned, well carded, drawn and evenly spun into a suitable yarn size for the backing.

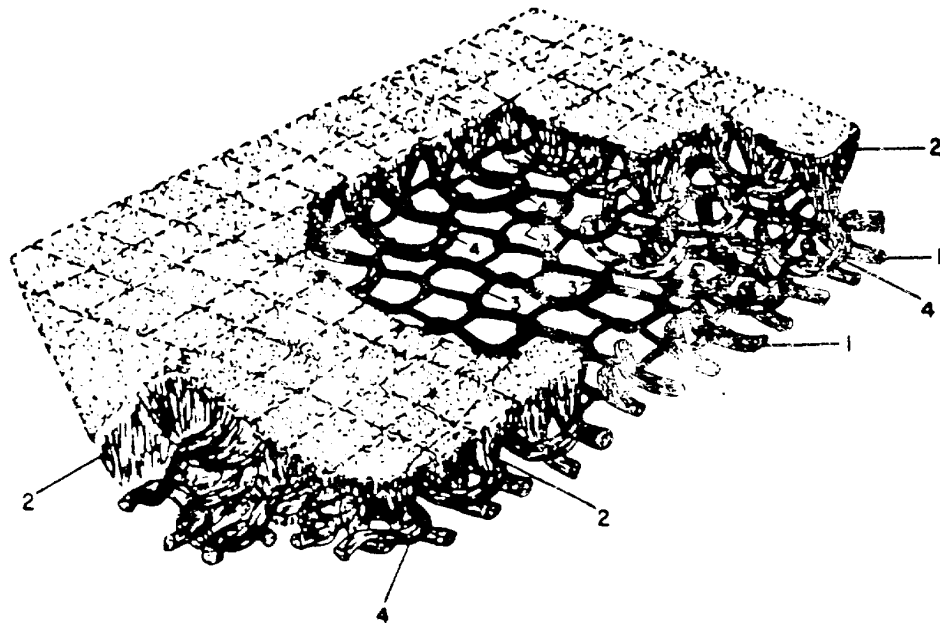
* 3.2.2 Pile. The pile fiber shall be carded and drawn to form a smooth even roving, inserted into the material as shown on figure 1. The pile fibers shall be 11 ounces per square yard minimum of the total cloth weight when tested as specified in Table V.

* 3.2.3 Backing compound. The backing compound shall consist of a vinyl acetate resin or acrylic resin suitably compounded to form a flexible backing with good resistance to dry cleaning solvents. When tested as specified in Table V (footnote 4/).

3.3 Ground fabric. The ground fabric shall be made of cotton yarn.

* 3.4 Physical requirements. The material shall conform to the properties specified in Table I when tested as specified in 4.3.

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1. Shows position of backing yarns in relation to pile yarns in knitted cloth.
2. Shows pile yarn of synthetic mouton after being sheared and in relation to backing yarn.
3. Indicates formation of wales and courses in backing material.
4. Indicates interlacing of pile yarn into backing yarns.

FIGURE 1. Pile and backing construction.

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* 3.4.1 Resistance to blocking. The backing material shall show no signs of blocking when tested as specified in Table V.

* 3.4.2 Flexibility. The backing material shall not crack or break when tested as specified in Table V (footnote 4/).

3.5 Dimensions.

3.5.1 Width. The width of the cloth shall be as specified by the procuring activity (see 6.2).

3.5.2 Length of piece. Length shall be not less than 30 continuous yards. Lengths less than 30, but not less than 10 continuous yards may be accepted by the procuring activity under limitations and conditions set forth in the invitation for bids (see 6.2).

* 3.5.3 Length of roll. Rolls shall contain one continuous piece, free from splices, except where short lengths are permitted, two or more short lengths may be put up in one roll, provided there is no splice and provided the roll complies with the applicable weight limitations of PPP-P-1153.

3.6 Color. Except when otherwise specified, the color shall be sage green, Air Force shade 1530, to match the standard sample (see 6.3).

3.6.1 Matching. The color shall match the standard sample when viewed from a position normal to the cloth surface and under natural (north sky) daylight or artificial light having a color temperature of 7500° Kelvin. The color shall be a good approximation to the standard sample under incandescent lamplight at 2800° Kelvin. Because of directional effects, the standard and the sample to be compared shall be brushed and viewed in the same direction relative to construction and angle of lighting

* 3.6.2 Colorfastness. The finished cloth shall show colorfastness to dry cleaning and wet and dry crocking equal to or better than the standard sample. When no standard sample is available, the finished cloth shall show good fastness to dry cleaning and wet and dry crocking when tested as specified in Table IV.

3.7 Fiber identification. Each roll shall be labeled, ticketed, or invoiced for fiber content in accordance with the Rules and Regulations Under the Textile Fiber Products Identification Act.

3.8 Workmanship. The finished cloth, pile (synthetic mouton, knitted) shall conform to the quality and grade of product established by this specification. The occurrence of defects shall not exceed the acceptable quality levels.

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 the specification where such inspections are deemed necessary to assure that supplies and services conform to prescribed requirements.

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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 certification.

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

4.2.1 Examination of the end item. Defects found during this examination shall be classified in accordance with 4.2.1.1 through 4.2.1.4.

* 4.2.1.1 Yard-by-yard examination. The required yardage of each roll shall be examined on the pile side only and defects clearly noticeable at normal inspection distance (3 feet) shall be classified as listed in Table II and as defined in MIL-STD-1491. 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 severe shall be counted. A continuous defect shall be counted as one defect for each linear yard or fraction thereof in which it occurs. The sample unit shall be one linear yard. The acceptable quality level (AQL) shall be 6.5 defects per 100 units (yards). The sample size shall be in accordance with Inspection Level II of MIL-STD-105. The lot size shall be expressed in units of one yard each. The number of rolls selected shall be in accordance with table III. An equal number of yards shall be examined in each roll in the sample.

4.2.1.2 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 shown in Table III.

Defects

Width less than minimum specified
 Finish not equal to standard sample (if referenced for finish)
 Off-shade, shaded end to end, side to center, side to side, or throughout the piece
 Mottled, cloudy, streaky or poor penetration
 Objectable odor
 Overall uncleanness
 Uneven nap
 Density of nap not uniform throughout the surface

* 4.2.1.3 Examination for length of individual pieces. The pieces shall be examined for length. Any length found to be less than the specified minimum length, or any length found to be more than 2 yards below the length marked on the piece ticket, any piece found less than 30 yards in length shall be considered as a defect with respect to length. The sample unit shall be one piece. The number of pieces selected as a sample and the acceptance number shall be in accordance with Table III.

* 4.2.1.4 Examination for total yardage in sample. The lot size shall be unacceptable if the total of the actual lengths of pieces in the sample is less than the total of the lengths marked on piece tickets.

4.2.2 Examination of preparation for delivery. An examination shall be made in accordance with the provisions of PPP-P-1133 to determine that packaging, packing and marking requirements of section 5 of this specification are complied with, except that the inspection level shall be S-2 and the AQL shall be 2.5.

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* 4.3 Testing of components and materials. The quality assurance provisions for components and materials, except as otherwise required by this specifications, shall be in accordance with the applicable specifications and standards referenced herein. A certificate of compliance shall be furnished by the contractor for the characteristics listed in Table IV.

* 4.3.1 Testing of the end item. The methods of testing specified in FED-STD-191, whenever applicable, and as listed in Table V shall be followed. Except where otherwise specified, the physical and chemical values specified in section 3 apply to the results of the determinations made on the sample unit for test purposes as specified in the applicable test methods. The sample unit shall be 2 yards full width of the finished cloth. The sample size (number of sample units) shall be as shown below. The lot shall be unacceptable if one or more sample units fail to meet any requirement specified.

Lot size (yards)	Sample size (units)
800 or less	2
801 to 22,000	3
22,001 and over	5

* 4.3.2 Test for pile weight. The original (total) weight of the specimen (pile fabric without backing) shall be determined by method 5041 of FED-STD-191, except that a specimen size not less than 4 ± 0.0 inches square using a template shall be cut from the back with a sharp razor blade. The weighed specimen shall then be placed on a flat surface with the pile side up, and the pile sheared off with an electric clipper. An Oster model, No. 111, or equal, electric clipper carrying a No. 50, size 000 cutting head is recommended, and in case of dispute shall be used in the determination that shall be considered final (see 6.4). Shearing shall be done in the direction of the wales, and in the direction of the courses, with the base of the cutting head parallel to the plane of the specimen. Following the shearing, the specimen shall be shaken to remove the shearings and shall be weighed. This procedure shall be repeated until the sheared backing attains a constant weight of 0.05 gram tolerance. The sheared backing shall be examined for damage to the backing yarns. If damage is found, the results shall be discarded and the entire procedure repeated. The weight of the pile shall be determined by subtracting the weight of the sheared backing from the original weight.

* 4.3.3 Pile height determination. The pile height shall be determined by use of a scale graduated in sixteenths of an inch, or finer. The end of the scale shall be inserted vertically into the pile so that it rests squarely, but without pressure, in the yarns. The pile adjacent to the face of the scale shall be straightened and laid along the scale surface and measurement taken at the fiber ends. Five determinations shall be made at locations across and along the specimen and the result reported as the average of the five determinations expressed to the nearest sixteenth of an inch.

* 4.3.4 Pile recovery. A 4 by 4 inch test specimen shall be placed in a metal box $4 \frac{1}{4}$ by $4 \frac{1}{4}$ inches with sides $\frac{3}{4}$ inch high. A $4 \frac{1}{4}$ by $4 \frac{1}{4}$ inch plate shall be placed on the sample unit and the thickness of the specimen and plate shall be measured at each corner and the results averaged. A 10 pound weight shall then be placed on the metal plate for 1 hour. The thickness at each corner under 10 pounds pressure shall then be measured and the results averaged. The 10 pound weight shall then be removed. The thickness shall be measured and averaged after 1 minute and after 4 hours, and percent recovery calculated using the following formula:

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$$\text{Percent} = \frac{\text{Final no load thickness} - \text{Thickness under 10 lbs pressure} \times 100}{\text{Original no load thickness} - \text{Thickness under 10 lbs pressure}}$$

4.4 Examination for preparation for delivery. Inspection of the preservation, packaging, packing, and marking shall be in accordance with the requirements of section 5 or of the documents specified therein.

* 5. PACKAGING

* 5.1 Put-up requirements. These requirements shall be in accordance with Level A (3.2.1) of specification PPP-P-1133, except that the fabric shall be put-up on a suitable reel in which the layers of fabric shall be separated from the next succeeding layer to prevent crushing of the pile.

* 5.2 Packaging requirements. The fabric shall be packaged on a suitable reel in which the layers of the fabric shall be separated from the next succeeding layer to prevent crushing of the pile.

* 5.3 Packing. Packing shall be Level A, B, or Commercial as specified (see 6.2). The reel in 5.1 shall be suspended in the container so that it will in no position exert pressure on any layer of the cloth.

* 5.3.1 Levels A, B, or Commercial. The cloth shall be packed in accordance with the applicable requirements of PPP-P-1133.

5.4 Marking. Interior packages and exterior shipping containers shall be marked in accordance with PPP-P-1133. When bar codes are specified in the acquisition document they shall be applied in accordance with MIL-STD-129. The nomenclature shall be as follows:

Cloth, pile (synthetic mouton, knitted)

*Type

*Length

*Width

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*Applicable data to be entered by the supplier.

* 5.5 Palletization. When specified (see 6.2) fabric packed as specified in 5.3, shall be palletized in accordance with load type I of MIL-STD-147. Each prepared load shall be bonded with primary and secondary straps in accordance with the bonding means K and L. Pallet patterns shall be in accordance with the appendix of MIL-STD-147. Interlocking of loads shall be effected by reversing the pattern of each course. If the container is of a size which does not conform to any of the patterns specified in MIL-STD-147, the pallet pattern used shall first be approved by the contracting officer.

6. NOTES

6.1 Intended use. The cloth covered by this specification is intended for use in the manufacturing of clothing items.

* 6.2 Ordering data. Acquisition documents should specify the following:

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- a. Title, Number, and date of this specification.
- b. Type required.
- c. Length of roll and quantity desired.
- d. Width of cloth.
- e. Point of inspection.
- f. Selection of applicable levels of packaging and packing (5.1 and 5.2).
- g. Percent of short lengths and reduction from contract price as specified.
- h. When palletization is required (see 5.5).

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

6.4 Local barber supply agencies may be sources for the clipper described. The prime source is John Oster Manufacturing Company, 5055 N. Lydell Street, Milwaukee, Wisconsin 53217.

* 6.5 Changes from previous issue. The margins of this specification are marked with asterisks 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 irrespective of the marginal notations and relationship to the last previous issue.

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(Project No. 8305-F868)

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TABLE I. Construction.

Characteristic	Type I	Type II
Pile denier	6 or 7	6
Weight, oz/sq yd, min	24±2 oz/sq yd	25±2 oz/sq yd
Wales, per inch min	12	12
Courses, per inch, min	20	20
Bursting strength, lbs, min	85.0	85.0
Pile, height, inch	1/2±1/16	1/2±1/16
Pile, recovery %		
After 1 minute, min	11.0	11.0
After 4 hours recovery, min	60	60

TABLE II. List of defects (napped side).

Bare spots or thin places (pile missing)
Cut, hole or tear
Any mends
Spot, stain or streak clearly visible
Broken or missing yarn resulting in insufficient or inadequately secured nap
Embedded crease clearly visible
Dropped stitch or run

*

TABLE III. Sample size.

Lot size in yards	Sample size in rolls (or containers)	Acceptance number
Up to 1200 <u>1/</u>	3	0
1201 to 3200	5	0
3201 to 10,000	7	0
10,001 to 35,000	10	1
35,001 to up	15	2

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

TABLE IV. Component test.

Characteristic	Requirement Reference
Material identification	3.3
Backing compound	3.2.
Material identification	Table I (type)
Denier	Table I

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TABLE V. Method of testing.

Characteristic	Rqmt para	Test Method	No. det. /sample	Results reported as
Weight, total <u>1/</u>	Table I	5041		
Pile	3.2.2	5041 and 4.3.2	5	To the nearest ounce per square yard
Wales per inch	Table I	5070		
Courses per inch	Table I	5070		
Bursting strength	Table I	5120		
Pile height	Table I	4.3.3	5	To the nearest sixteenth inch
Pile recovery	Table I	4.3.4	3	To the nearest %
Blocking <u>2/</u>	3.4.1	5872		
Flexibility <u>3/</u>	3.4.2	5874		
Colorfastness to:				
Dry cleaning <u>4/</u>	3.6.2	5620		
Crocking	3.6.2	5650		

- 1/ Except that the specimen size shall be not less than 4 inches square.
- 2/ Two 4 x 4-inch samples shall be used for the test and placed back to back only. The samples shall be exposed to a temperature of $170^{\circ} \pm 2^{\circ}$ F for a period of 4 hours.
- 3/ Except that:
- a. Paragraphs 3.2., 4.4, 4.5, 4.6.1, and 5.3 of method 5874 for hydrostatic resistance shall not apply.
 - b. Paragraph 4.1, method 5874, shall be changed to read $-40^{\circ} \pm 3.6^{\circ}$ F for 4 hours.
 - c. Paragraphs 4.2, method 5874, delete sentences 7 and 8 and substitute: "The cloth shall be folded pile side out, in both the warp and filling directions".
- 4/ In addition to the colorfastness test, the backing compound shall remain flexible and shall show no tackiness, cracking, or flaking (see 3.2 3). The test for colorfastness and blocking shall be run concurrently

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