

INCH-POUND

MIL-B-44346(GL)

24 May 1989

## MILITARY SPECIFICATION

## BATTING, SYNTHETIC FIBER, MEDIUM DENSITY

This specification is approved for use by the Natick Research, Development, and Engineering Center, Department of the Army, and is available for use by all Departments and Agencies of the Department of Defense.

## 1. SCOPE

1.1 Scope. This specification covers one type of polyester fiber batting material.

## 2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation (see 6.2).

## SPECIFICATIONS

## FEDERAL

PPP-P-1133 - Packaging of Synthetic Fiber Fabrics

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 8320

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MILITARY

MIL-C-21852 - Cloth, Taffeta, Nylon

STANDARDS

FEDERAL

FED-STD-191 - Textile Test Methods

MILITARY

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

(Unless otherwise indicated, copies of federal and military specifications, standards, and handbooks are available from the Naval Publications and Forms Center, (ATTN: NPODS), 5801 Tabor Avenue, Philadelphia, PA 19120-5099.)

2.2 Non-Government publications. The following document forms 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 cited in the solicitation. Unless otherwise specified, the issues of documents not listed in the DODISS are the issues of the documents cited in the solicitation (see 6.2).

AMERICAN ASSOCIATION OF TEXTILE CHEMISTS AND COLORISTS (AATCC)

AATCC - 135 Test Method for Dimensional Changes in Automatic  
Home Laundering of Woven and Knitted Fabrics

(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.)

(Non-Government standards and other publications are normally available from the organizations that prepare or distribute the documents. These documents also may be available in or through libraries or other informational services.)

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 takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 First article. When specified (see 6.2), a sample shall be subjected to first article inspection (see 6.3) in accordance with 4.3.

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3.2 Materials.

3.2.1 Polyester binder fiber, 4.0 denier. The fiber shall be 4.0 denier and shall consist of a core of polyester having a minimum melting point of 465°F sheathed with polyester polymer mixture having a melting point of 275° to 300°F. The core and sheath shall each make up 50 +/- 10 percent by weight of the fiber. The fiber shall have 8 to 10 crimps per inch and a 1.5 to 2.0 inch cut staple length.

3.2.2 Polyester fiber, 1.65 denier. The fiber shall be 1.65 denier and shall be formed from polyester having a minimum melting point of 465°F. The fiber shall have 8 to 10 crimps per inch and a 1.5 to 2.0 inch cut staple length.

3.2.3 Polyester fiber, 1.65 denier, coated. The fiber shall be 1.65 denier and shall be formed from polyester having a minimum melting point of 465°F. The fiber shall be coated with a durable polydimethyl-siloxane such that 0.25 to 0.55 percent by weight of the coated fiber will be silicone. The fiber shall have 8 to 10 crimps per inch and a 1.5 to 2.0 inch cut staple length.

3.3 Construction.

3.3.1 Fiber blend. The polyester fibers specified in 3.2.1, 3.2.2, and 3.2.3 shall be intimately blended in the following proportions:

<u>Fiber</u>	<u>Percent of blend (+/- 5)</u>
4.0 denier (3.2.1)	25
1.65 denier (3.2.2)	37.5
1.65 denier, coated (3.2.3)	37.5

3.3.2 Batting fabrication. The intimate fiber blend specified in 3.3.1 shall be made into batting by air-laying or card/cross lapping fibers into a web which is then consolidated by needlepunching to achieve the batting weight and thickness requirements specified in table I. The consolidated batting shall be heat set to bond the fibers. A time/temperature exposure shall be established for heat treatment which enables the binder fibers in the batting center to be activated without providing excessive heat exposure (excessive heat exposure can result in a harsh surface hand).

3.4 Physical requirements. The finished bonded batting shall conform to the requirements specified in table I, 3.4.1 and 3.4.2 when tested as specified in 4.4.3.

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TABLE I. Physical requirements

Characteristic	Requirement
Weight, oz/yd <sup>2</sup>	8.4 +/- 0.8
Thickness, inches, at 0.002 psi, min:	
initial	0.63
after laundering	0.57
Dimensional stability, percent, max:	
length and width	3.0

3.4.1 Batting evenness. The evenness of the finished bonded batting shall be such that no single weight determination shall deviate more than 10 percent from the 8.4 oz/yd<sup>2</sup> target weight specified in table I. A 12 by 12-inch specimen shall be used for each weight determination. Testing shall be as specified in 4.4.3.

3.4.2 Laundryability. The laundered batting shall show no greater batting separation, thin or thick spots, or curling than the batting before laundering when viewed over a black background. The laundered batting shall not demonstrate a thickness reduction greater than 10 percent from its measured thickness before laundering when tested as specified in 4.4.3.

3.5 Length and put-up. For Government procurement only, unless otherwise specified (see 6.2), the batting shall be furnished in continuous lengths of 30 yards each, and shall be put-up as specified in 5.1.1.

3.6 Workmanship. The batting shall conform to the quality of product established by this specification and the occurrence of defects shall not exceed the applicable acceptable quality level.

#### 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 this specification where such inspections are deemed necessary to ensure supplies and services conform to prescribed requirements.

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4.1.1 Responsibility for compliance. All items shall 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 ensuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling inspection, as part of manufacturing operations, is an acceptable practice to ascertain conformance to the requirements, however, this does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to accept 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 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 3.1), 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 of 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-105.

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 Component and material certification. A certificate of compliance may be acceptable as evidence that the characteristics listed in table II conform to the specified requirements.

TABLE II. Component and material certification

Characteristic	Requirement paragraph
Material identification <sup>1/</sup> , denier, melting point, staple length, and crimp of fibers	3.2.1, 3.2.2, and 3.2.3
Percent coating on fiber <sup>1/</sup>	3.2.3
Fiber blend proportions	3.3.1

<sup>1/</sup> The certification shall include the fiber manufacturer's identification data.

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4.4.2 Batting examination. The batting shall be examined for the defects listed in table III. The defects shall be counted regardless of their proximity to each other, except where two or more defects represent a single local condition of the batting, in which case only the more serious defect shall be counted. A continuous defect shall be counted as one defect for each lengthwise yard or fraction thereof in which it occurs. The lot size shall be expressed in yards. The sample unit shall be 1 yard full width of the material. The inspection level shall be II and the acceptable quality level (AQL), expressed in terms of defects per hundred units, shall be 4.0 for major defects and 10.0 for total (major and minor combined) defects.

TABLE III. Batting defects

Defect	Classification	
	Major	Minor
Any hole, cut, or break (tear)	X	
Crease or wrinkle, embedded		X
Batting uneven - resulting in thin, thick or weak place, clearly visible <u>1/</u>	X	
Spot or stain, clearly visible <u>1/</u>		X
Objectionable odor		X
Batting not made from well opened fibers	X	
Surface not uniform or smooth due to neps or multiple fiber ends	X	
Harsh batting hand		X

1/ At normal inspection distance, approximately 3 feet, when viewed against a black background.

4.4.3 End item testing. The batting shall be tested for the characteristics listed in table IV. The methods of testing specified in FED-STD-191 wherever applicable and as listed in table IV shall be followed. All test reports shall contain the individual values utilized in expressing the final results. 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 methods. The sample unit shall be 3 yards full width, cut at right angles to the trimmed edge along the length of a roll of the batting. The lot shall be unacceptable if one or more sample units fail to meet any test requirement specified. The sample size (number of sample units) shall be in accordance with the following:

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<u>Lot size (yards)</u>	<u>Sample size (sample units)</u>
800 or less	3
801 up to and including 22,000	5
22,001 and over	7

TABLE IV. End item tests

<u>Characteristic</u>	<u>Requirement paragraph</u>	<u>Test method</u>
Weight	3.4	5041 <u>1/</u> <u>2/</u>
Thickness:		
initial	3.4	5030 <u>1/</u> <u>3/</u>
after laundering	3.4	5030 <u>3/</u> and 4.5.4
Dimensional stability	3.4	AATCC - 135 and 4.5.2
Evenness	3.4.1	<u>4/</u>
Laundryability	3.4.2	4.5.3

- 1/ The test specimen sampling pattern requires two 12 inch by 12 inch square and one 21 inch by 21 inch square batting specimens be cut from each 1 yard length of the 3 yard sample unit to total six 12 inch by 12 inch and three 21 inch by 21 inch square batting specimens. Further, the specimens shall be sampled diagonally across the sample unit so that the same number of each size specimens are obtained from each of the left, center, and right areas of the batting width. No two specimens shall be samples from the same machine or cross-machine direction. The six 12 inch by 12 inch square specimens shall be used to measure batting weight, evenness, and initial thickness, and the three 21 inch by 21 inch square specimens shall be used to evaluate batting dimensional stability, and laundryability.
- 2/ Method 5041 except that six 12 inches by 12 inch square specimens shall be tested. The individual and mean weight of the six specimens shall be reported.
- 3/ Except that each of the six specimens and the presser foot shall be a 12 inch by 12 inch square. The presser foot shall be capable of applying a total load of 0.002 psi on each specimen.

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4/ Batting evenness shall be evaluated by comparing the 6 individual weight determinations to the mean specified in footnote 2/. The sample unit shall be considered a failure if any weight determination deviates more than 10 percent from the mean of the 6 specimens.

4.4.4 Packaging inspection. The inspection shall be in accordance with the quality assurance provisions of PPP-P-1133.

4.5 Methods of inspection.

4.5.1 Laundrying procedure. Three 21 by 21-inch square batting specimens shall be cut from the sample unit. The batting specimens shall be prepared for laundrying by sewing a square of batting between two pieces of nylon taffeta cloth conforming to MIL-C-21852, type III, class 1. The layers shall be orientated such that the length direction of the batting coincides with the warp direction of the taffeta cover fabrics. The assembly shall be completely overedged stitched on all four sides at approximately 1 inch in from the outer edge. Finally, the assembly shall be stitched at the center of the square, lengthwise in the warp direction to yield two quilt channels with nominal dimensions of 10 inches in width by 20 inches in length. After assembling the quilted batting squares, the specimens shall be marked for dimensional stability determination per AATCC Test Method-135 for woven fabric on one of the taffeta cloth sides except the bench marks shall be 18 inches. The three prepared and marked specimens shall be subjected to three laundrying cycles conforming to AATCC Test Method-135, Normal washing machine cycle, Washing temperature II, Drying procedure A; Delicate tumble, do not press. The specimens shall be used for determination of dimensional stability, launderability, and thickness after laundrying (see 4.5.2, 4.5.3 and 4.5.4).

4.5.2 Dimensional stability test. The three specimens prepared, marked and laundryed as specified in 4.5.1 shall be measured for dimensional change. The percent change for both length and width shall be calculated for each specimen.

4.5.3 Launderability test. After completion of laundrying as specified in 4.5.1 and dimensional stability determination in 4.5.2, remove the taffeta cloth coverings from the three laundryed specimens. The exposed batting shall be laid over a black background and visually compared to the initial batting before laundrying. The appearance of thin spots, curling or separation in excess of that evidenced by the initial unlaundered batting shall be considered a test failure.

4.5.4 Thickness after laundrying test. Three 12 by 12-inch square size specimens shall be cut from the laundryed batting specimens after the launderability test specified in 4.5.3. The specimens shall be cut such that the quilt stitching line indentation is orientated in the center area of the specimen. The specimen shall be tested for thickness as specified in 4.4.3 and results averaged to the nearest 0.01 inch.



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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 Level A and Commercial. The batting shall be put-up and preserved in accordance with the applicable requirements of PPP-P-1133.

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 batting shall be packed in accordance with the applicable requirements of PPP-P-1133.

5.3 Marking. In addition to any special marking required by the contract or purchase order, shipments shall be marked in accordance with the applicable requirements of PPP-P-1133.

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 medium density batting is intended for use as insulation for a canteen carrier.

6.2 Acquisition requirements. Acquisition documents must specify the following:

- a. Title, number, and date of this specification.
- b. Issue of DODISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.1.1 and 2.2).
- c. When a first article is required (see 3.1, 4.3, and 6.4).
- d. Length if other than specified (see 3.5).
- e. Levels of preservation and packing (see 5.1 and 5.2).

6.3 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.

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6.4 Fiber blend. The requirements for the polyester batting have been met with the use of DuPont's Dacron T-233 fiber blend.

6.5 Subject term (key word) listing.

Insulation  
Needlepunch  
Nonwoven

Custodians:  
Army - GL

Preparing activity:  
Army - GL

Review activities:  
Army - MD  
DLA - CT

Project 8320-A095

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

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## STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

(See Instructions - Reverse Side)

1. DOCUMENT NUMBER MIL-B-44346(GL)		2. DOCUMENT TITLE Batting, Synthetic Fiber, Medium Density					
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)					