

March 1991

Superseding

Interim Specification

5100-00522

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U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

SPECIFICATION

PAD, SLEEPING

1. SCOPE

1.1 Scope. This specification covers the requirements for a sleeping pad.

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 issue of these documents shall be those in effect on date of invitation for bids or request for proposal (see 6.2).

SPECIFICATIONS

FEDERAL

PPP-B-636 - Boxes, Shipping, Fiberboard

STANDARDS

FEDERAL

FED-STD-123 - Marking for Shipment (Civil Agencies)

FED-STD-595 - Colors (Requirements For Individual Color Chips)

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: USDA Forest Service, Missoula Technology and Development Center, Building 1, Fort Missoula, Missoula, MT 59801-7294, by using the Specification Comment Sheet at the end of this document or by letter.

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 Standardization Documents Order Desk, Bldg. 4D, 700 Robbins Ave., Philadelphia, PA 19111-5094).

2.2 Non-Government publications. The following document forms a part of this document to the extent specified herein (see 6.2).

ASTM (AMERICAN SOCIETY FOR TESTING AND MATERIALS)

- D 1056 - Flexible Cellular Materials--Sponge or Expanded Rubber (1985)
- D 3575 - Flexible Cellular Materials Made From Olefin Polymers (1984)
- D 3576 - Cell Size of Rigid Cellular Plastics (1977)

(Apply for copies to: American Society for Testing and Materials, 1916 Race St., Philadelphia, PA 19103-1187.)

(Non-Government standards and other publications normally are 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 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 First article. Unless otherwise specified (see 6.2), the contractor shall furnish three samples for first article inspection and approval (see 4.3 and 6.4).

3.2 Materials and components.

3.2.1 Pad body. The body of the pad shall be manufactured from closed cell expanded ethylene vinyl acetate copolymer foam. The pad shall be manufactured under a high pressure process that results in a fine cell structure. Pads shall be split from buns and shall not have skin faces. The material shall be chemically blown using a blowing agent that is non-toxic, and whose products of decomposition are non-toxic. Chlorofluorocarbons shall not be used in manufacturing the pad body. The color of the foam shall be a gray that closely approximates color 36231 of FED-STD-595. The pad body shall contain no welds.

3.2.2 Pad dimensions. The pad shall be 3/8 ±1/32 inch thick, 23 ±1/4 inches wide and 75 ±1/2 inches in length.

3.2.3 Physical properties. The physical properties of the body of the pad shall conform to the requirements cited in table I.

TABLE I. Physical properties of expanded ethylene vinyl acetate copolymer foam

Property	Requirements
Tensile strength, psi, min	45
Elongation, % min	185
Tear resistance, lbs/inch, min	9
Density, lbs/cu ft, max	2.2
Shrinkage 6 hrs \pm 2 mins, @ 158 \pm 4 $^{\circ}$ F, % max	5
10 mins \pm 15 secs, @ 212 \pm 4 $^{\circ}$ F, % max	15
Compression deflection	
@ 10 psi, % max	43
@ 30 psi, % max	73
Compression set	
22 hrs @ 73 \pm 4 $^{\circ}$ F, % max	23
22 hrs @ 0 $^{\circ}$ F, % max	28
Water absorption, % max	5
Cell size, inch, max	0.025

3.3 Workmanship. The pad shall conform to the quality of product established by this document. The occurrence of defects shall not exceed the acceptable quality levels (AQL).

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 document where such inspections are deemed necessary to ensure supplies and services conform to prescribed requirements.

4.1.1 Responsibility for compliance. All items shall 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.

4.1.2 Responsibility for dimensional requirements. Unless otherwise specified in the contract or purchase order, the contractor is responsible for assuring that all specified dimensions have been met. When dimensions cannot be examined on the end item, inspection shall be made at any point or at all points in the manufacturing process necessary to assure compliance with all dimensional requirements.

4.1.3 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.

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 first article is required (see 6.2), it shall be examined for the defects specified in 4.4.1, 4.4.2, and 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 herein, sampling for inspection shall be performed in accordance with MIL-STD-105.

4.4.1 End item visual examination. The end item shall be examined for the defects listed. The lot size shall be expressed in units of pads. The sample unit shall be one complete pad. 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 defects.

Examine

Defect

Pad body

Any cut, split, tear, hole, or crack

Not uniform; contains large voids
or inclusions

Not clean or the presence of foreign
matter

4.4.2 End item dimensional examination. The end item shall be examined for conformance to all dimensions (see 3.2.2). Any dimension deviating from the specified requirement shall be classified as a defect. The lot size shall be expressed in units of pads. The sample unit shall be one complete pad. The inspection level shall be S-3 and the AQL, expressed in terms of defects per hundred units, shall be 6.5.

4.4.3 End item testing. The item shall be tested for the characteristics listed in table II. The sample unit shall be one pad. The lot size shall be expressed in units of one pad. The inspection level shall be S-2 for all testing. Any test failure shall be cause for rejection of the lot. All test reports shall contain the individual values utilized in expressing the final results.

TABLE II. End item test

<u>Characteristics</u>	<u>Specification Requirement</u>	<u>Reference Test Method</u>
Material identification	3.2.3	<u>1/</u>
Tensile strength, psi, min	3.2.3	ASTM 3575
Elongation, % min	3.2.3	ASTM 3575
Tear resistance, lbs/inch, min	3.2.3	ASTM 3575
Density, lbs/cu ft, max	3.2.3	ASTM 3575
Shrinkage, % max	3.2.3	4.4.3.1
Compression deflection		
@ 10 psi, % max	3.2.3	ASTM 3575
@ 30 psi, % max	3.2.3	ASTM 3575
Compression set		
22 hrs @ 73 ±4°F, % max	3.2.3	ASTM 3575 & 4.4.3.2
22 hrs @ 0°F, % max	3.2.3	ASTM 3575 & 4.4.3.2
Water absorption, % max	3.2.3	ASTM 1056
Cell size, inch max	3.2.3	ASTM 3576

1/ The certification shall include material identification data.

4.4.3.1 Heat shrinkage. The test method for determining the heat shrinkage is as follows:

Apparatus

- a. 12-inch ruler graduated in 0.1-inch dimensions.
- b. Air circulation oven capable of maintaining 212 ± 4 degrees F.
- c. Aluminum or steel plate about 14 inches square and approximately 0.060 inch thick.

Specimen Preparation

Three test specimens each measuring approximately 10 inches by 1 inch by 3/8 inch shall be cut using a die stamp or other suitable means from the sample. Samples shall not be tested less than 24 hours after manufacture. The specimens shall be marked by any suitable means about 1 inch from each end of the specimen and the distance between the two marks shall be measured to the nearest 0.1 inch.

Procedure

Three specimens shall be tested at each time-temperature condition (see table I). The specimens shall be lightly dusted with french chalk and placed in an oven at the required temperature on a preheated aluminum or steel plate similarly dusted with french chalk. After the required time has elapsed the plate and specimens shall be removed from the oven and the specimens tipped, as quickly as possible, onto a non-conducting surface such as asbestos and allowed to cool for 15 minutes. The metal plate shall then be dusted again and replaced in the oven. No further tests shall be performed until both the oven and metal plate have remained at the required temperature for at least 5 minutes. The timing of the heating period shall commence when the oven is closed and end when the door is opened. Any temperature drop due to the insertion of the test specimens shall be ignored. No more than six specimens shall be tested at any one time. After the specimens have been allowed to cool for at least 15 minutes, the distance between the marks shall be measured to the nearest 0.1 inch.

Calculation of Results

The heat shrinkage shall be calculated from:
$$S = \frac{L_1 - L_2}{L_1} \times 100$$

S = percentage heat shrinkages

L₁ = original length, in inches

L₂ = final length, in inches

4.4.3.2 Compression set. Specimens shall be kept in the test apparatus at the specified temperature for 22 hours. The specimens shall be removed from the test apparatus and allowed to recover for 2 hours at room temperature then measured for thickness.

4.4.4 Examination for preparation for delivery. A random sample of unit, intermediate, and shipping containers (as applicable) shall be selected from each lot and examined for conformance with the preservation, packaging, packing, labeling, and marking required in the contract or order. The inspection level shall be S-2, AQL 6.5 expressed in terms of defects per 100 units.

<u>Examine</u>	<u>Defect</u>
Marking (exterior and unit pack)	Omitted; incorrect; illegible; of improper size, location, sequence, or method of application
Materials	Any component missing, damaged, or not as specified
Workmanship	Inadequate application of components such as incomplete closure of container flaps, loose strapping, improper taping, or inadequate stapling Bulged or distorted container
Content	Number per container is more or less than required

5. PACKAGING

5.1 Packing. Packing shall be as specified.

5.1.1 Packing pads. Fifty (50) sleeping pads shall be packed in a fiberboard shipping container conforming to style FTC, type CF variety SW, class domestic, grade 350 of PPP-B-636 except the size limitations shall be waived. Sleeping pads shall be packed flat, 50 in depth within a snug fitting shipping container. Each shipping container shall be closed in accordance with the appendix of PPP-B-636 except that the inspection shall be in accordance with 4.4.4.

5.2 Marking. In addition to any special marking required by the contract or purchase order, shipping containers shall be marked in accordance with FED-STD-123.

6. NOTES

6.1 Intended use. Each sleeping pad is intended for use as a ground cover in conjunction with a sleeping bag.

6.2 Acquisition requirements. Acquisition documents must specify the following:

- a. Title, number, and date of this document.
- b. When required, the specific issue of individual document referenced (see 2.1.1 and 2.2).
- c. When first article samples are not required (see 3.1, 4.3, and 6.4).

6.3 Standard sample. For access to standard shade sample, address the procuring office issuing the invitation for bid or request for proposal.

6.4 First article. When first articles are required, they 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 the acquisition instruments regarding arrangements for selection, inspection, and approval of the first article.

6.5 Preparing activity. USDA Forest Service, Missoula Technology and Development Center, Building 1, Fort Missoula, Missoula, MT 59801-7294.

Standardization Document Improvement Proposal

This form is provided to solicit beneficial comments that may improve this document and enhance its use. Contractors, government activities, manufacturers, vendors, and users are invited to submit comments to:

USDA Forest Service
Missoula Technology and Development Center
Building 1, Fort Missoula
Missoula, MT 59804-7294

Attach any additional pertinent information that may be of use in improving this document to this form and mail in an envelope. A response will be provided when the submitter includes their name and address.

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