

MIL-I-1986E  
5 December 1986  
SUPERSEDING  
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12 July 1977

## MILITARY SPECIFICATION

### INSOLE, FOOTWEAR, FELT, INSULATING

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

#### 1. SCOPE

1.1 Scope. This document covers felt insoles.

1.2 Classification. The insoles shall be one type in the following sizes as specified (see 6.2).

#### Schedule of sizes

Small  
Medium  
Large  
Extra Large

#### 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 the 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 8335

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SPECIFICATIONS

FEDERAL

- |           |                               |
|-----------|-------------------------------|
| A-A-203   | - Paper, Kraft, Untreated     |
| PPP-B-636 | - Boxes, Shipping, Fiberboard |

MILITARY

- |             |  |
|-------------|--|
| MIL-L-35078 | - Loads, Unit: Preparation of Semiperishable Subsistence Items, Clothing, Personal Equipment and Equipage; General Specification For |
|-------------|--|

STANDARDS

FEDERAL

- |             |                        |
|-------------|------------------------|
| FED-STD-191 | - Textile Test Methods |
|-------------|------------------------|

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- |             |   |
|-------------|---|
| MIL-STD-105 | - Sampling Procedures and Tables for Inspection by Attributes |
| MIL-STD-129 | - Marking for Shipment and Storage                            |
| MIL-STD-147 | - Palletized Unit Loads                                       |
| MIL-STD-731 | - Quality of Wood Members for Containers and Pallets          |

(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.

U.S. DEPARTMENT OF AGRICULTURE (USDA)

Official Standards of the United States for Grades of Wool

(Applications for copies should be addressed to the Livestock Division, Standardization Section, Agricultural Marketing Service, U.S. Department of Agriculture, Washington, DC 20250.)

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Rules and Regulations Under the Wool Products Labeling Act of 1939  
(16 CFR Part 300)

(Application for copies should be addressed 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.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

D 3951 - Standard Practice for Commercial Packaging

(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 Guide sample. Samples, when furnished, are solely for guidance and information to the contractor (see 6.3). Variation from this document may appear in the sample, in which case this document shall govern.

3.2 Material.

3.2.1 Felt.

3.2.1.1 Mixture. The mixture used for the felt shall be of the following composition by weight, when tested as specified in 4.2.1.1:

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a. Not less than 30 percent of scoured wool, either pulled or shorn, of sound fiber not lower in grade than 36's U.S. Standard (carpet wool permissible).

b. Not less than 30 percent clean, washed, and sterilized cattle hair (see 3.2.1.2).

c. Remainder shall be reprocessed wool except that 3 percent of fiber other than wool or hair will be allowed.

3.2.1.2 Cattle hair. The cattle hair used in the mixture shall be resilient new stock and shall not contain any vegetable fiber, reworked hair, or hair from other kinds of animals. The hair shall be washed and the epidermis removed.

3.2.1.3 Finished felt. The finished felt shall be smooth, firm, and even in thickness and shall conform to the following requirements when tested as specified in 4.2.1.1:

a. Thickness shall be 0.250 to 0.282 inch.

b. Thickness regain shall be a minimum 90 percent.

c. Weight shall be 3.8 to 4.2 pounds per square yard.

d. Chloroform and water soluble material shall be a maximum 6 percent.

e. Felt shall be free from offensive odor.

\* 3.3 Construction. The insoles shall be cut from the finished felt to match the patterns.

3.4 Patterns. Patterns shall conform to standard patterns furnished by the Government. A tolerance of  $\pm 1/16$  inch is permitted.

3.5 Marking. Each insole shall have the size marked in the center of the toe area, in characters a minimum of  $3/4$  inch in height. The color of the marking medium shall be white. The marking shall include the information required by the Wool Products Labeling Act.

3.6 Workmanship. The finished insoles shall conform to the quality and grade of product established by this document. The occurrence of defects shall not exceed the applicable acceptable quality levels.

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## 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.

- \* 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.

4.1.2 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 Quality conformance inspection. Unless otherwise specified, sampling for inspection shall be performed in accordance with MIL-STD-105.

4.2.1 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.

4.2.1.1 Component testing. Testing shall be performed on the felt component for the characteristics listed in table I. The methods of testing specified in FED-STD-191, wherever applicable, and as specified herein shall be followed. All test reports shall contain the individual values utilized in expressing the final result. The sample unit shall be 1/2 yard full width. The lot shall be unacceptable if one or more sample units have an offensive odor, or any lot average fails to meet the specified requirement. The sample size shall be as follows:

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| <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                  |

TABLE I. Felt component tests

| Test<br>method | Character-<br>istic                            | Require-<br>ment<br>paragraph | <u>Requirement<br/>applicable to</u> |                        | Results<br>reported<br>numerically<br>to nearest |
|----------------|--|-------------------------------|--------------------------------------|------------------------|--|
|                |  |                               | <u>Sample<br/>unit</u>               | <u>Lot<br/>average</u> |  |
| 2101           | Wool content                                   | 3.2.1.1                       | -                                    | X                      | 0.1 percent                                      |
| 4.3.1 1/       | Wool grade                                     | 3.2.1.1                       | -                                    | -                      | -  |
| 1/             | Fiber mix-<br>ture                             | 3.2.1.1<br>and<br>3.2.1.2     | -                                    | -                      | -  |
| 5030 2/        | Thickness                                      | 3.2.1.3                       | -                                    | X                      | 0.001 inch                                       |
| 4.3.2          | Thickness<br>regain                            | 3.2.1.3                       | -                                    | X                      | 1 percent  |
| 5040           | Weight   | 3.2.1.3                       | -                                    | X                      | 0.1 pound per<br>sq. yard                        |
| 2611           | Chloroform<br>and water<br>soluble<br>material | 3.2.1.3                       | -                                    | X                      | 0.1 percent                                      |
| 4.3.3          | Odor   | 3.2.1.3                       | X                                    | -                      | -  |

A certificate of compliance shall be submitted and will be acceptable for the stated requirement.

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- 2/ Method 5030 shall be used, except that applied load shall be 1.00  
± 0.01 pound per square inch.
- 

4.2.2 End item visual examination. The end item shall be examined for the defects listed below. The lot size shall be expressed in units of insoles. The sample unit shall be one insole. The inspection level shall be II and the acceptable quality level (AQL), expressed in terms of defects per hundred units, shall be 6.5.

| <u>Examine</u> | <u>Defect</u>  |
|----------------|--|
| General        | Any cut, hole, or tear that may affect comfort or serviceability<br>Marked variation in density or thickness of insole<br>Any lump or thick or thin spot that may affect comfort or serviceability<br>Surfaces not smooth or surface finished in such a manner that comfort is affected<br>Any wrinkle or crease that may affect comfort<br>Any distortion of insole<br>Presence of foreign matter affecting comfort or serviceability or seriously affecting appearance<br>Spot, stain, or streak seriously affecting appearance<br>Jagged or uneven edges or other evidence of poor workmanship<br>Insole not required size or does not conform to Government patterns |
| Marking        | Omitted, incorrect, illegible, incomplete, not accomplished in the specified manner, or not in the proper location   |

- \* 4.2.3 Packaging examination. The fully packaged end items shall be examined for the defects listed below. The lot size shall be expressed in units of shipping containers. The sample unit shall be one shipping container fully packaged. The inspection level shall be S-2 and the AQL, expressed in terms of defects per hundred units, shall be 2.5.

| <u>Examine</u>                  | <u>Defect</u>   |
|---------------------------------|---|
| Marking (exterior and interior) | Omitted; incorrect; illegible; of improper size, location, sequence, or method of application |

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ExamineDefect

## Materials

Any component missing, damaged, or not as specified

## Workmanship

Inadequate application of components, such as incomplete sealing or closure of flap, improper taping, loose strapping or inadequate stapling  
Bulged or distorted container

## Content

Number per unit pack is more or less than specified  
Number per container is more or less than required

- \* 4.2.4 Palletization examination. The fully packaged and palletized end items shall be examined for the defects listed below. The lot size shall be expressed in units of palletized unit loads. The sample unit shall be one palletized unit load, fully packaged. The inspection level shall be S-1 and the AQL, expressed in terms of defects per hundred units, shall be 6.5.

ExamineDefect

## Finished dimensions

Length, width, or height exceeds specified maximum requirement

## Palletization

Pallet pattern not as specified  
Interlocking of loads not as specified  
Load not bonded with required straps as specified

## Weight

Exceeds maximum load limits

## Marking

Omitted; incorrect; illegible; of improper size, location, sequence, or method of application

4.3 Methods of inspection.

4.3.1 Test for wool grade. The wool shall be visually examined and approved for grade (see 3.2.1.1) in accordance with USDA Methods for Test for Grades of Wool.

4.3.2 Thickness, percent regain. Subject the felt to a pressure of 2 pounds per square inch for a period of 10 minutes and then remove the load. Measure the thickness 10 minutes after removal of the load in accordance with method 5030 of FED-STD-191 except that the load shall be 16 ounces  $\pm$  0.1 ounce per square inch. Number of determinations per sample unit shall be five.



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4.3.3 Test for offensive odor. Immerse a specimen of the felt approximately 8 inches square for 24 hours in distilled water at a temperature of 158° to 167°F and allow to dry naturally. Inspect the felt for offensive odor during and after drying. Upon removal of the specimen, the water shall be clear and free of any sediment. The water shall not develop any offensive odor when allowed to stand in an unsealed container for 72 hours at a room temperature of not less than 70°F. One determination per sample unit shall be made, and the results shall be reported as "pass" or "fail".

## 5. PACKAGING

5.1 Preservation. Preservation shall be level A or Commercial, as specified (see 6.2).

5.1.1 Level A. Ten pairs of insoles of one size only shall be stacked in two piles of five pairs each. The two piles shall then be reverse nested heel to toe and securely tied together at each end with cotton tape or twine.

\* 5.1.2 Commercial. Insoles shall be preserved in accordance with ASTM D 3951.

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

\* 5.2.1 Level A packing. One hundred and sixty pairs of insoles of one size only, preserved as specified in 5.1, shall be packed in a fiberboard shipping container conforming to style RSC-L, grade V2s of PPP-B-636. The inside of each fiberboard shipping container shall be fitted with a box liner conforming to type CF, class weather-resistant, variety DW, grade V15c of PPP-B-636. Level A unit packs shall be packed flat two in length, two in width, and four in depth within a shipping container. Inside dimensions of each shipping container shall be approximately 26 inches in length, 16 1/2 inches in width, and 15 inches in depth. Approximate dimensions are furnished as a guide only. Three ounces of naphthalene flakes shall be uniformly distributed throughout the contents of each shipping container (see 6.2.1). Each container shall have the contents completely covered on the top and bottom with a sheet of 30 pound minimum basis weight kraft paper conforming to A-A-203. Each shipping container shall be closed in accordance with method III, waterproofed in accordance with method V, and reinforced as specified in the appendix of PPP-B-636, except that the inspection shall be in accordance with 4.2.3. Toward the end of the contract or when there are less than the required amount per container of the same size, mixed sizes may be packed within the same container. Shipping containers shall be arranged in unit loads in accordance with MIL-L-35078 for the type and class of load specified (see 6.2). Strapping shall be limited to nonmetallic strapping, except for type II, class F loads.

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- \* 5.2.2 Level B packing. One hundred and sixty pairs of insoles of one size only, preserved as specified in 5.1, shall be packed in a fiberboard shipping container conforming to style RSC-L, type CF (variety SW) or SF, class domestic, grade 200 of PPP-B-636. The inside of each fiberboard shipping container shall be fitted with a box liner conforming to type CF, class domestic, variety DW, grade 200 of PPP-B-636. Level A unit packs shall be packed flat two in length, two in width, and four in depth within a shipping container. Inside dimensions of each shipping container shall be approximately 26 inches in length, 16 1/2 inches in width, and 15 inches in depth. Approximate dimensions are furnished as a guide only. Three ounces of naphthalene flakes shall be uniformly distributed throughout the contents of each shipping container (see 6.2.1). Each container shall have the contents completely covered on the top and bottom with a sheet of 30 pound minimum basis weight kraft paper conforming to A-A-203. Each shipping container shall be closed in accordance with method II as specified in the appendix of PPP-B-636 except that the inspection shall be in accordance with 4.2.3. Toward the end of the contract or when there are less than the required amount per container of the same size, mixed sizes may be packed within the same container.

5.2.2.1 Weather-resistant fiberboard containers. When specified (see 6.2), the shipping container shall be a grade V3c, V3s, or V4s fiberboard box fabricated in accordance with PPP-B-636 and closed in accordance with method III as specified in the appendix of PPP-B-636 except that the inspection shall be in accordance with 4.2.3.

5.2.3 Commercial packing. Insoles, preserved as specified in 5.1, shall be packed in accordance with ASTM D 3951.

- \* 5.3 Palletization. When specified (see 6.2), insoles, packed as specified in 5.2.2 or 5.2.3, shall be palletized on a 4-way entry pallet in accordance with load type Ia of MIL-STD-147. Pallet type shall be type I (4-way entry), type IV or type V in accordance with MIL-STD-147. Pallets shall be fabricated from wood groups I, II, III, or IV of MIL-STD-731. Each prepared load shall be bonded with primary and secondary straps in accordance with bonding means K and L or film bonding means O or P. Pallet pattern shall be number 3 in accordance with appendix of MIL-STD-147. Interlocking of loads shall be effected by reversing the pattern of each course.

- \* 5.4 Marking. In addition to any special marking required by the contract or purchase order, unit packs, shipping containers, and palletized unit loads shall be marked in accordance with MIL-STD-129 or ASTM D 3951, as applicable. Each unit pack shall have a manila colored paper shipping tab with identification information in accordance with USDA Wool Products Labeling Act.

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- \* 5.4.1 Labels, mixed sizes. Each shipping container packed with mixed sizes shall have securely attached to the end and side, directly under the printing or stenciling, a white paper label 5 by 4 inches with the words "MIXED NSN's" plainly stamped or printed thereon and under these words shall be legibly stamped or printed the correct quantity of pairs and NSN's contained therein.

## 6. NOTES

6.1 Intended use. The insoles are intended for use in cold climate footwear by personnel of the Department of Defense.

6.2 Ordering data. Acquisition documents should specify the following:

- a. Title, number, and date of this document.
- b. Sizes required (see 1.2).
- c. Selection of applicable levels of preservation and packing (see 5.1 and 5.2).
- d. Type and class of unit load required (see 5.2.1).
- e. When weather-resistant grade fiberboard shipping containers are required for level B packing (see 5.2.2.1).
- f. When palletization is required (see 5.3).

6.2.1 Naphthalene flakes. The naphthalene flakes requirement is not applicable when Government furnished material of wool or part wool content has been mothproof treated (see 5.2.1 and 5.2.2).

6.3 Samples. For access to samples, address the contracting activity issuing the invitation for bids.

- \* 6.4 Subject term (key word) listing.

Cattle hair  
Felt  
Footwear  
Insole  
Wool

6.5 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. 8335-0163

Review activities:

Army - MD  
Air Force - 82  
DLA - CT

User activity:

Navy - MC

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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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|   |  |   |  |
|---|--|---|--|
| 1. DOCUMENT NUMBER<br>MIL-I-1986E                             |  | 2. DOCUMENT TITLE<br>Insole, Footwear, Felt, Insulating |  |
| 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 |  |
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NATICK OP, 1 Apr 84