

INCH - POUND
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MIL-DTL-6060E

12 August 2004

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SUPERSEDING

MIL-E-6060D

2 November 1982

## DETAIL SPECIFICATION

## BAGS, WATERVAPORPROOF, HEAT-SEALABLE, COMPLEX

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

## 1. SCOPE

1.1 Scope. This specification covers heat-sealable, watervaporproof bags of complex construction for use in military preservation applications.

## 2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3 and 4 of this specification. This section does not include documents cited in other sections of this specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements of documents cited in sections 3 and 4 of this specification, whether or not they are listed.

2.2 Government documents.

2.2.1 Specifications and standards. The following specifications and standards form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

Comments, suggestions, or questions on this document should be addressed to: Commander, Naval Air Warfare Center Aircraft Division (Code 414100B120-3), Highway 547, Lakehurst, NJ 08733-5100 or emailed to <a href="mailto:Thomas.Omara@navy.mil">Thomas.Omara@navy.mil</a> . Since contact information can change, you may want to verify the currency of this address information using the ASSIST Online database at <a href="http://www.dodssp.daps.mil">www.dodssp.daps.mil</a> .
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### DEPARTMENT OF DEFENSE SPECIFICATIONS

- MIL-PRF-131 - Barrier Materials, Watervaporproof, Greaseproof, Flexible, Heat-Sealable.
- MIL-PRF-22191 - Barrier Materials, Transparent, Flexible, Heat-Sealable.

### DEPARTMENT OF DEFENSE STANDARDS

- MIL-STD-2073-1 - Standard Practice for Military Packaging.
- MIL-STD-3010 - Test Procedures for Packaging Materials.

(Copies of these documents are available online at <http://assist.daps.dla.mil/quicksearch> or [www.dodssp.daps.mil](http://www.dodssp.daps.mil) or from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

2.3 Non-Government publications. The following document forms a part of this document to the extent specified herein. Unless otherwise specified, the issues of this document are those cited in the solicitation or contract.

### AMERICAN SOCIETY FOR QUALITY (ASQ)

- ASQ-Z1.4 - Procedures, Sampling and Tables for Inspection by Attributes. (DOD adopted)

(Copies of this document are available from [www.asq.org](http://www.asq.org) or the American Society for Quality, 600 Plankinton Avenue, Milwaukee, WI 53203.)

2.4 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 in accordance with 4.2.

3.2 Material. Bags shall be fabricated from barrier material conforming to MIL-PRF-131, class 1.

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3.3 Features. Watervaporproof bags shall have one or more of the following features (see 6.4):

- a. One or more double-seam heat seals; i.e., a horizontal seam joining a vertical seam at any point other than at the open end or bottom of the bag.
- b. One or more transparent inspection windows.
- c. Gasketed holes for hold-down.

3.4 Construction. Bags shall be fabricated as specified in the contract or purchase order. Only barrier material of a single manufacturer's designation shall be used in fabricating one bag. The number of widths of barrier material shall be a minimum. Bags fabricated from more than one width of barrier material shall have all seams, except side seams, parallel to the open end of the bag. Seams parallel to the open end, but on opposite sides of the bag, shall not join a common vertical seam within  $2\frac{1}{2}$  inches of each other.

3.5 Dimensions and tolerances. The length and width of bags shall be as specified in the contract or purchase order. The width shall be measured from the inside edges of the side seams. The length shall be measured from the inside edge of the bottom seam to the open edge of the bag. Tolerances for the length and width of the bag shall be  $\pm \frac{1}{4}$  inch.

3.6 Seams. Seams shall be heat-sealed, uniform, and continuous. The width of all seams shall be not less than  $\frac{1}{2}$  inch. Seams shall not exhibit delamination or separation of the barrier material plies after heat-sealing. Each unit package of bags shall include a sheet legibly marked with recommended heat-sealing conditions for continuous band and rotary, and jaw-type sealing equipment.

3.7 Identification. Bags shall have identification markings made with water-resistant ink on each outer side of the bag. The color and position of the printing is optional. Lettering shall be upper case only and shall be not less than  $\frac{1}{4}$  inch high. The following information shall be included:

- a. This specification number and revision letter.
- b. Bag manufacturer's name and bag designation.
- c. Month and year of bag fabrication.
- d. Bag part number (if applicable).
- e. Any special instructions required to ensure proper application of the bag.

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3.8 Inspection windows. Unless otherwise specified, inspection windows shall conform to the requirements of 3.8.1 through 3.8.3.

3.8.1 Window material. Inspection windows shall be constructed of material conforming to MIL-PRF-22191, type I.

3.8.2 Window dimensions. Unless otherwise specified, for bags having both outside length and width dimensions greater than 36 inches, the window shall be 4 inches by 8 inches and the window material shall be 6 inches by 10 inches. For smaller bags, the window shall be 2 inches by 4 inches using window material 4 inches by 6 inches.

3.8.3 Mounting of window. The window material shall be centered under the window aperture in the barrier material and completely heat-sealed in place. The heat-seal shall form a continuous bond that meets the requirements of 4.4.3.

3.9 Gaskets.

3.9.1 Gasket material. Gaskets shall have a nominal thickness of  $0.062 \pm 0.010$  inch and shall be made of any resilient material that forms a seal and meets the requirements of 4.4.4. The shape and size of the gaskets shall be as specified in the contract or purchase order.

3.9.1.1 Gasket adhesive. A water-resistant adhesive shall be used for mounting the gaskets to the barrier material.

3.9.2 Gasket mounting. Gaskets shall be attached to the inside and outside of the envelope, shall coincide with their paired members, and shall not be positioned within 1 inch of the inside line of any seam. The gaskets shall be mounted at points indicated on the packaging instructions. No holes shall be punched in the barrier material for the hold down bolts unless specified in the contract or packaging instructions.

3.10 Workmanship. Bags shall be free from any foreign matter, holes, tears, cuts, sharp creases, wrinkles, or other imperfections.

3.11 Performance requirements. The bags shall meet the requirements specified in table I when tested in accordance with 4.4.

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TABLE I. Performance requirements.

PROPERTY	REQUIREMENT	TEST PARAGRAPH REFERENCE
Seam strength	No separation.	4.4.1
Double-seam leakage	No evidence of leakage at double-seam joint.	4.4.2
Inspection window mounting integrity	No evidence of leakage through or around the perimeter of the window.	4.4.3
Gasket mounting integrity	No evidence of separation or degradation of gasket; no leakage around gasket/bolt area.	4.4.4

## 4. VERIFICATION

4.1 Classification of inspections. The inspection requirements specified herein are classified as follows:

- a. First article inspection (see 4.2).
- b. Conformance inspection (see 4.3).

4.2 First article inspection. First article inspection shall consist of all the tests and examinations specified in this specification.

4.3 Conformance inspection. Conformance inspection shall consist of the performance tests specified in 4.4.1, 4.4.2, 4.4.3, 4.4.4, and the visual examinations specified in 4.3.2.

4.3.1 Sampling for conformance inspection. For the purpose of determining the sample size in accordance with ASQ-Z1.4, the lot size (see 6.3) shall be expressed in number of bags produced in one production run. An inspection level as specified in ASQ-Z1.4 of S-1 shall be used for the testing specified in 4.4 and level S-3 for the visual examinations specified in 4.3.2.

4.3.2 Examination of end item for defects in material, construction, dimensions and tolerance, seams, and identification. The sample unit for the end item visual inspection shall be one bag. The sample unit shall be visually inspected and measured to ensure it meets the requirements specified in 3.2 through 3.10.

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4.4 Performance testing.

4.4.1 Seam strength. Heat-sealed seam test specimens from bags shall be tested in accordance with MIL-STD-2073-1, Appendix G. Six specimens, 1 by 2 1/2 inches cut perpendicular to the specified seams shall be tested from the following locations:

- a. One specimen from a point one inch below the open end of each vertical seam.
- b. Three specimens from random points along each vertical seam.
- c. Two specimens from random points along each horizontal seam.

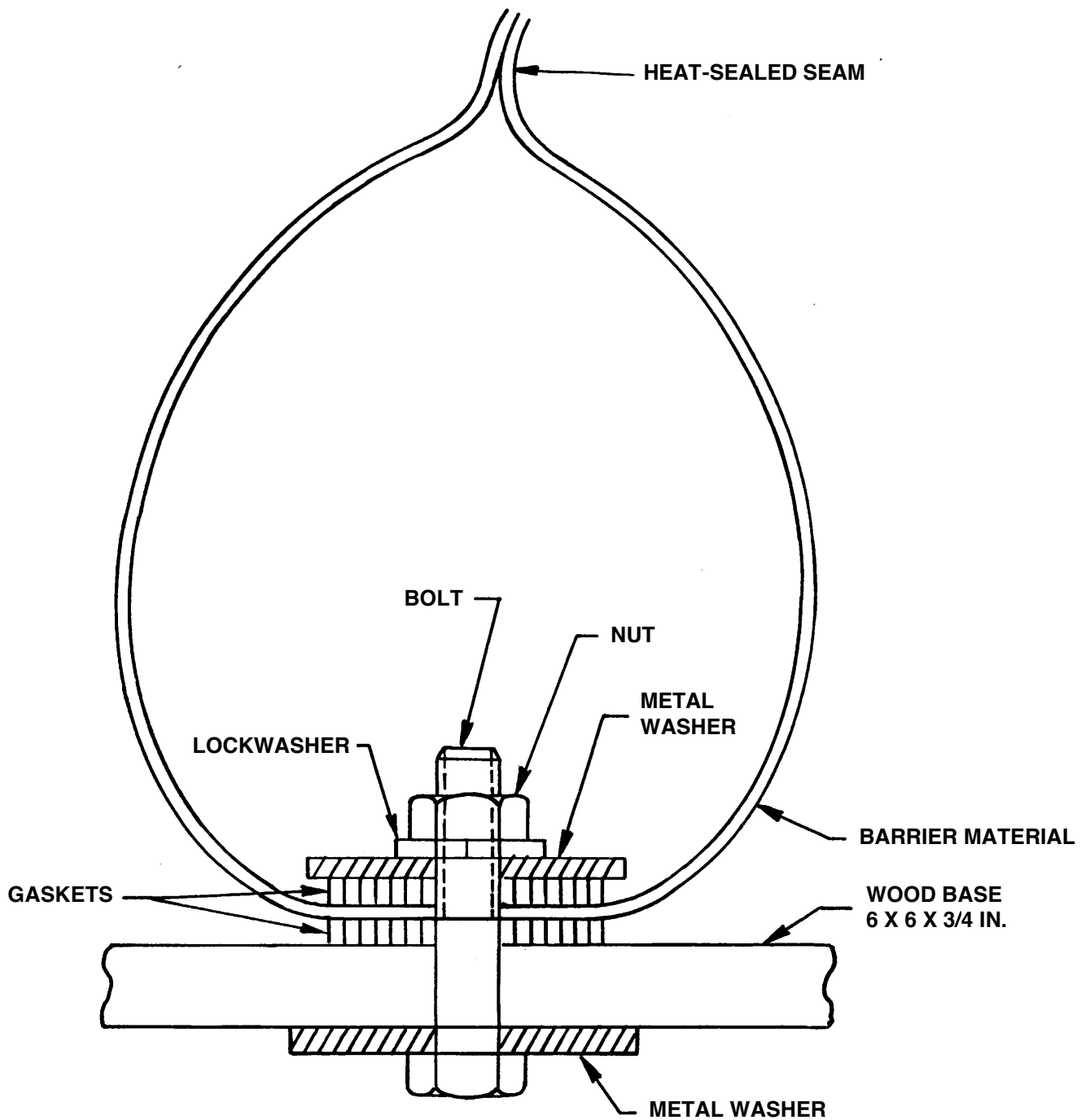
4.4.2 Double seam leakage. Identify each double-seam in the bag. A sample containing each double-seam, 6 inches by 5 inches, shall be cut from the bag so that the double-seam is centered within the specimen. Form the specimen into a pouch by heat-sealing along each 5-inch edge. Pour a water solution containing dye into the pouch to a depth of two inches. Suspend the pouch vertically for 15 minutes. Carefully pour off the dye solution and examine the outside of the pouch for dye leakage at the double-seam. Each double-seam in the bag shall be tested.

4.4.3 Inspection window mounting integrity. The mounted window, including enough surrounding barrier material to subsequently form a pouch, shall be removed from the bag. The entire flat test specimen shall then be drawn completely around a rigidly mounted 2-inch diameter mandrel while keeping the two side edges of the specimen aligned throughout the procedure. Repeat this procedure three more times while rotating the specimen 90 degrees for each test. Turn the specimen over and repeat these tests with the opposite face of the material next to the mandrel. The test specimen shall then be folded along the largest dimension with the interior of the window mounting on the inside. Form the specimen into a pouch by heat sealing the barrier material along the smaller edges. Pour dye solution into the pouch to a level one inch above the uppermost edge of the window mounting. Suspend the pouch vertically for 15 minutes. Remove the dye solution and examine the window mounting area for leakage.

4.4.4 Gasket mounting integrity. A section of the bag containing a gasketed mounting hole shall be removed from the bag to form a test sample that also includes enough surrounding barrier material to subsequently form a pouch. The entire test specimen shall be drawn over a mandrel in the same fashion and sequence as that specified in 4.4.3, except that the mandrel diameter in this case shall be 5/8 inch. The sample shall then be incorporated into a simulated floating bag assembly as shown on figure 1. The bolt shall be tightened until the gasket is evenly compressed. A pouch shall then be formed from the surrounding barrier material. An air inlet valve shall be installed in the barrier material prior to making the final seal. Slowly inject compressed air into the test assembly until a minimum of 2 psi internal pressure is maintained. Submerge the inflated test assembly in a tank of water and observe for any indication of gas leakage which will be indicated by a steady stream or recurring succession of bubbles around the gasketed mounting hole.

4.4.5 Thickness of gaskets. The thickness of the gaskets shall be measured in accordance with MIL-STD-3010, Method 1003.

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NOTE: Sizes of bolt and washers shall be appropriate for inside diameter of gasket under test.

FIGURE 1. Gasket mounting integrity test assembly.

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## 5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When packaging of materiel is to be performed by DoD or in-house contractor personnel, these personnel need to contact the responsible packaging activity to ascertain packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activities within the Military Service or Defense Agency, or within the military service's system commands. Packaging data retrieval is available from the managing Military Department's or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

## 6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

6.1 Intended use. Bags covered by this specification are intended for use in specialized military methods of preservation. The barrier materials, from which these bags are constructed, are all approved and are military unique. They provide the necessary attributes to protect items from exposure to the extremes of the navy/naval aviation environment. There are no commercial equivalents that can provide similar protection. Specifically, MIL-STD-2073-1, Methods of Preservation 43 and 53, utilize these bags in order to provide specialized military preservation.

6.2 Acquisition requirements. Acquisition documents should specify the following:

- a. Title, number, and date of the specification.
- b. If first article inspection is required (see 3.1).
- c. Special features required (see 3.3).
- d. Packaging requirements (see 5.1).

6.3 Lot size. Inspection lot should consist of all bags manufactured by the same process from the same raw material during one production run.

6.4 Special features. Bags with none of these features are covered by MIL-DTL-117.



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### 6.5 Subject term (key word) listing.

Barrier material  
Container  
Double-seam  
Gasketed holes  
Inspection window  
Packaging material  
Preservation

6.6 Changes from previous issue. Marginal notations are not used in this revision to identify changes with respect to the previous issue due to the extensiveness of the changes.

#### Custodians:

Army – SM  
Navy – AS  
Air Force – 11  
DLA - DH

#### Preparing activity:

Navy – AS

(Project 8105-0385)

#### Review activities:

Army – AT, AV, EA, GL3, MI  
Navy – MC, OS, SA, SH

NOTE: The activities listed above were interested in this document as of the date of this document. Since organizations and responsibilities can change, you should verify the currency of the information above using ASSIST Online database at <http://www.dodssp.daps.mil>.