INCH-POUND

MIL-B-273F
19 January 1990
SUPERSEDING
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MILITARY SPECIFICATION

BAG, DRINKING WATER STORAGE, DISPENSING, CLOTH, COTTON DUCK, POROUS

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

1. SCOPE

1.1 Scope. This specification covers a porous, cotton duck, cloth bag for storing and dispensing drinking water.

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

CCC-D-950	-	Dyeing and Aftertreating Processes for Cotton Cloths
PPP-B-601	-	Boxes, Wood, Cleated-Plywood
PPP-B-621	-	Boxes, Wood, Nailed and Lock-Corner
PPP-B-636	-	Boxes, Shipping, Fiberboard

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 4610

DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

MILITARY

MIL-P-116 - Preservation, Methods of

STANDARDS

FEDERAL

FED-STD-191 - Textile Test Methods

MILITARY

MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes
MIL-STD-129 - Marking for Shipment and Storage
MIL-STD-130 - Identification Marking of U.S. Military Property
MIL-STD-147 - Palletized Unit Loads
MIL-STD-731 - Quality of Wood Members for Containers and Pallets

(Unless otherwise indicated, copies of federal and military specifications, standards, and handbooks are available from the Standardization Documents Order Desk, Bldg. 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.)

2.1.2 Other Government documents, drawings, and publications. The following other Government documents, drawings, and publications form a part of this document to the extent specified herein. Unless otherwise specified, the issues are those cited in the solicitation.

DRAWINGS

U.S. ARMY NATICK RESEARCH, DEVELOPMENT, AND ENGINEERING CENTER

13200E6480 - Bag, Drinking Water Storage: Dispensing, Cloth, Cotton Duck, Porous
13200E6481 - Bag Body
13200E6482 - Faucet
13200E6483 - Cover
13200E6484 - Ring, Body

(Copies of drawings are available from the U.S. Army Natick Research, Development, and Engineering Center, ATTN: STRNC-EMSS, Natick, MA 01760-5014.)

2.2 Non-Government 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 are 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 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 19103-1187.)

(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.

3.2 Samples. Samples of the item, when furnished, are solely for guidance and information to the contractor (see 6.4). Variations from this specification may appear in the sample, in which case this specification shall govern.

3.3 Materials and components. Materials and components shall be as specified on the drawings (see 2.1). It is encouraged that recycled material be used when practical as long as it meets the requirements of this specification.

3.4 Construction. The construction shall conform in all respects to the drawings listed in section 2 and as specified herein.

3.4.1 Automatic stitching. Automatic stitching machines may be used to perform any of the required stitch patterns provided the requirements for the stitch pattern, stitches per inch, size and type of thread are met; and at least three tying, overlapping, or backstitches are used to secure the ends of stitching.

3.4.1.1 Type 301 stitching. Ends of all stitching shall be backstitched or overstitched not less than 1 inch except where ends are turned under or caught in other seams and stitching. Thread tensions shall be maintained so that there will be no excessively tight stitching resulting in puckering of the materials sewn.

3.4.1.1.1 Repairs of type 301 stitching. Repairs of type 301 stitching shall be as follows:

a. When thread breaks or bobbin run-outs occur during stitching, the stitching shall be repaired by restarting a minimum of 1 inch (1/2 inch for box-x and W-W stitching) behind the end of the stitching. 1/

b. Thread breaks or two or more consecutive skipped or run-off stitches noted during inspection of the item (in-process or end item) shall be repaired by overstitching. The stitching shall start a minimum of 1 inch before the defective area (1/2 inch on box-x and W-W stitching) and continue a minimum of 1 inch beyond the defective area onto the existing stitching. Loose or excessively tight stitching shall be repaired by removing the defective stitching without damaging the materials and restitching in the required manner. 1/

1/ When making the above repairs, the end of the stitching is not required to be backstitched.

3.4.2 Fusing of ends of synthetic tape and cord ends. All exposed raw ends of synthetic tape and cord shall be fused. The apparatus used to fuse the tape and cord ends shall be capable of providing sufficient heat to provide a smooth edge with the cut ends of the yarns all fused together. Fusing of the tape and cord ends shall be accomplished prior to being assembled for stitching.

3.4.3 Setting of grommets. Holes shall be prepunched to receive the grommets. Holes prepunched to receive the grommets shall be smaller than the outside diameter of the grommet barrel so that the barrel must be forced through the hole. The grommet shall be securely clinched without cutting the adjacent material.

3.5 Dyeing and aftertreatment.

3.5.1 Color, water repellency treatment. Cotton duck cloth for the bag body shall be dyed Olive Drab 7 in accordance with type I, class C of CCC-D-950. Cotton duck cloth for the covers shall be rendered water repellent and dyed Olive Drab 7 in accordance with type I, class D of CCC-D-950.

3.5.1.1 Resin treatment. Cotton duck cloth for the bag body shall be treated with resin after dyeing by impregnating the cloth with a water-dispersed copolymer methyl and ethyl acrylate resin, modified with a water-soluble cellulose ether. The side of the cloth that will form the inside of the bag shall be coated with the resin material. The treated cloth shall not adhere to itself and shall provide a seepage of water of not less than 0.2 or more than 0.5 milliliter per square centimeter per hour, when tested as specified in 4.4.1.1.

3.5.1.2 Leakage. The level of water in the bag after standing for 24 hours shall fall not more than 10 inches when tested as specified in 4.4.5.

3.6 Marking. The identification marking shall be printed or stenciled in the location shown on the applicable drawing and shall conform to MIL-STD-130.

3.6.1 Location marks. Location marks shall not be drilled. Printed markings for component location shall not be more than 1/32 inch wide.

3.7 Repairs. Repairs such as mends, darns, patches or splices are not permitted on the bag.

3.8 Replacement of defective components. During the spreading, cutting and manufacturing process, components of the bag having material defects or damages that are classified as defects in 4.4.3, shall be removed from production and replaced with nondefective and properly matched components.

3.9 Workmanship. The bag shall conform to the quality of product established by this specification.

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.

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 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 Responsibility for dimensional requirements. Unless otherwise specified in the contract or purchase order, the contractor is responsible for ensuring 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 ensure compliance with all dimensional requirements.

4.1.3 Certificates of compliance. Where 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 and 6.2), it shall be examined for the defects specified in 4.4.3 and 4.4.4 and tested for the characteristics specified in 4.4.5.

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 specification 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 below conform to the specified requirements.

Characteristic	Requirement paragraph	Test method
Resin treatment	3.5.1.1	------
Tackiness	3.5.1.1	4.5.1
Coated cloth seepage	3.5.1.1	4.5.2

4.4.2 In-process inspection. Inspection of subassemblies shall be made to ascertain that construction details which cannot be examined in the finished product are in accordance with specified requirements. The Government reserves the right to exclude from consideration for acceptance, any material or service for which in-process inspection has indicated nonconformance.

4.4.3 End item visual examination. The end items shall be examined for the defects listed in table I. The lot size shall be expressed in units of bags. The sample unit shall be one bag. The inspection level shall be II and the acceptable quality level (AQL), expressed in terms of defects per hundred units, shall be 2.5 for major defects and 6.5 for total (major and minor combined) defects.

TABLE I. End item visual defects

Examine	Defect	Classification Major	Classification Minor
Fabric	Not as specified	101	
	Hole, cut, tear, smash, broken or missing yarn, or open place clearly visible at normal inspection distance (approximately 3 feet)	102	

TABLE I. End item visual defects (cont'd)

Examine	Defect	Classification Major	Minor
Tape	Not firmly and tightly woven; edges frayed or scalloped	103	
	Multiple floats		201
	Any cut, hole, tear, or smash	104	
	Abrasion mark, slub, broken end, or pick		202
Tape and cord	Ends not fused as specified (where required)		203
Hardware (general)	Broken or malformed failing to serve intended purpose, corroded area, burr, or sharp edge	105	
	Finish omitted, partially omitted, or not as specified on brass		204
	Not assembled as specified (unless otherwise classified herein)	106	
	Not specified type, size, or style	107	
Grommets	Insecurely clinched or clinched excessively tight, cutting fabric	108	
	Washer installed on incorrect side		205
Open seam	1/2 inch or less		206
	More than 1/2 inch	109	
NOTE:	A seam shall be classified as open when one or more stitches joining a seam are broken or when two or more consecutive skipped or runoff stitches occur.		
Raw edge (on edge required to be finished)	More than 1/2 inch in length when securely caught in stitching	110	
NOTE:	Raw edge not securely caught in stitching shall be classified as an open seam.		
Runoff (see open seam)			
Seam and stitch type	Wrong seam or stitch type	111	

TABLE I. End item visual defects (cont'd)

Examine	Defect	Classification Major	Classification Minor
Stitch tension	Loose, resulting in a loose bobbin or top thread		207
	Excessively tight, resulting in puckering of material		208
Stitches per inch	One stitch less than minimum specified		209
	Two or more stitches less than minimum specified	112	
	One or more stitches in excess of maximum specified		210
	NOTE: Variation in the number of stitches per inch caused by the operator speeding up the machine and pulling the materials in order to sew over heavy places or heavy seams, or in turning corners shall be classified as follows: (a) Within the minor defect classification - no defect (b) Within the major defect classification - minor defect		
Thread breaks, skipped stitches, or runoffs	Not overstitched as specified		211
	NOTE: Thread breaks or two or more consecutive skipped or runoff stitches not overstitched shall be classified as open seams.		
Ends of stitching	Not secured as specified		212
Rows of stitching	Any row missing	113	
Component and assembly	Any component part omitted or not as specified or any required operation omitted (unless otherwise classified herein)	114	
	Needle chews	115	
	Any mend, darn, patch, or splice	116	
Binding	Loosely applied but not exposing raw edge of material		213
	Loosely applied exposing raw edge of material	117	

TABLE I. End item visual defects (cont'd)

Examine	Defect	Classification Major	Minor
Marking	Omitted, illegible, incorrect, or misplaced		214
Location markings	Drilled	118	
	Printed marking more than 1/32 inch in width		215
Cleanness	Any spot or stain clearly noticeable		216
Thread ends	Not trimmed to 1/4 inch maximum length		

4.4.4 End item dimensional examination. The end items shall be examined for conformance to the dimensions specified on the drawings. Only those dimensions that can be evaluated without damaging or disassembling the end items shall be examined. Any dimension not within the specified tolerance shall be classified as a defect. The lot size shall be expressed in units of bags. The sample unit shall be one bag. The inspection level shall be S-3 and the AQL, expressed in terms of defects per hundred units, shall be 10.

4.4.5 End item testing. The end item shall be tested as specified in 4.5.3 for conformance to the requirements specified in 3.5.1.2. The lot size shall be expressed in units of bags. The sample size shall be the number of bags indicated by inspection level S-2. Any test failure shall be cause for rejection of the lot.

4.4.6 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.

Examine	Defect
Marking (exterior and interior)	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 sealing or closure of flap, improper taping, loose strapping or inadequate stapling Bulged or distorted container
Content	Number per container is more or less than required

4.4.7 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.

Examine	Defect
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 as specified
Weight	Exceeds maximum load limits
Marking	Omitted; incorrect; illegible; of improper size, location, sequence, or method of application

4.5 Methods of inspection.

4.5.1 Tackiness test. Two specimens not less than 3 inches by 5 inches shall be used for this test. Place the coated sides of the specimens together and apply a pressure of not less than 0.7 pound per square inch at not less than 140°F for not less than 3 hours. Any adherence between the two specimens shall constitute failure of this test.

4.5.2 Seepage of coated cloth test. Three specimens not less than 8 inches by 8 inches shall be used for this test. Determine the seepage of the coated cloth in accordance with FED-STD-191, Method 5516, except that height of water shall be 30 inches, the coated side of the cloth shall be next to the water, and exposure time shall be not less than 60 minutes. Seepage of less than 0.2 $ml/cm^2/hr$ or more than 0.5 $ml/cm^2/hr$ shall constitute failure of this test.

4.5.3 Leakage of bag test. Conduct the test at a temperature between 70°F and 80°F, and a relative humidity of not more than 65 percent. Suspend the bag by the suspension cords. Fill the bag with water to the bottom of the overflow outlet, and tie the cover in place. After 4 hours, add water as required to bring the level of the water to the bottom of the overflow outlet. The bag shall then remain undisturbed for 24 hours, plus or minus 10 minutes. The water level of any bag dropping more than 10 inches below the bottom of the overflow outlet shall constitute failure of this test.

5. PACKAGING

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

5.1.1 Level A preservation. Each complete bag shall be compactly folded and preserved in accordance with MIL-P-116, method III in a close-fitting box conforming to PPP-B-636, W6c, style optional. The box shall be waterproofed using method V closure in accordance with the appendix of the box specification.

5.1.2 Commercial preservation. The bags 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. Bags preserved as specified in 5.1, shall be packed in a snug-fitting shipping container conforming to overseas type, style optional, grade B of PPP-B-601 or class 2, style optional of PPP-B-621. The gross weight of each shipping container shall not exceed 200 pounds. Closure and strapping shall be in accordance with the applicable box specification.

5.2.2 Level B packing. Bags preserved as specified in 5.1, shall be packed in a snug-fitting shipping container conforming to style RSC, grade V3c or V13 c of PPP-B-636. The weight of contents of each shipping container shall not exceed the weight limitations of the container specification.

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

5.3 Palletization. When specified (see 6.2), bags 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 types 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 C and D or film bonding means F or G. Pallet pattern shall be No. 32 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.

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 water storage bags are intended for use in the field as a container for drinking water.

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 first article is required (see 3.1, 4.3, and 6.3).
d. Levels of preservation and packing (see 5.1 and 5.2).
e. When palletization is required (see 5.3).

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.

6.4 Sample. For access to samples, address the contracting activity issuing the invitation for bids or request for proposal.

6.5 Seepage for cooling. The resinous finish of the bag allows the seepage of a small quantity of water through to the outside surface of the bag where it is evaporated and lowers the temperature of the water in the bag. Water purification chemicals, as prescribed, may be added to the water in the bag to keep the water potable.

6.6 Subject term (key word) listing.

Resin treatment
Water supply

6.7 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 - GL
Air Force - 99

Preparing activity:

Army - GL

(Project 4610-0115)

Review activities:

Army - MD
Air Force - 84
DLA - CS

User activities:

Navy - MC, YD