

MIL-B-45977A  
21 February 1984  
SUPERSEDING  
MIL-B-45977  
7 September 1976

MILITARY SPECIFICATION  
BINS, CABINETS, SHELVING, AND  
WORKTABLES, PACKAGING OF

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

1 SCOPE

1.1 Scope. This specification covers requirements for materials and methods for cleaning, drying, preservation, packing, and marking of bins, cabinets, shelving, and worktables for various conditions of protection for handling, shipments, and storage.

2 APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications, standards and handbooks. Unless otherwise specified (see 6.2), the following specifications, standards and handbooks of the issue listed in that issue of the Department of Defense Index of Specifications and Standards (DoDISS) specified in the solicitation form a part of this specification to the extent specified herein.

SPECIFICATIONS

FEDERAL

L-P-378 - Plastic Sheet and Strip, Thin Gauge, Polyolefin  
SS-G-659 - Graphite, Dry (Lubricating)

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commander, US Army Armament, Munitions and Chemical Command, ATTN: DRSMC-LEE-S, Rock Island, IL 61299 by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

FSC PACK

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- PPP-B-585 - Boxes, Wood, Wirebound
- PPP-B-601 - Boxes, Wood, Cleated-Plywood
- PPP-B-621 - Boxes, Wood, Nailed and Lock-Corner
- PPP-B-636 - Boxes, Shipping, Fiberboard
- PPP-B-640 - Boxes, Fiberboard, Corrugated, Triple-Wall
- PPP-C-795 - Cushioning Material, Flexible, Cellular, Plastic Film for Packaging Applications
- PPP-C-1797 - Cushioning Material, Resilient, Low Density, Unicellular, Polypropylene Foam
- PPP-T-320 - Fiberboard; Corrugated and Solid, Sheet Stock (Container Grade), and Cut Shapes
- PPP-T-60 - Tape: Packaging, Waterproof
- PPP-T-97 - Tape, Pressure-Sensitive Adhesive, Filament Reinforced

## MILITARY

- MIL-P-116 - Preservation-Packaging, Methods of
- MIL-B-117 - Bags, Sleeves and Tubing-Interior Packaging

## STANDARDS

## MILITARY

- MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes
- MIL-STD-129 - Marking for Shipment and Storage
- MIL-STD-147 - Palletized and Containerized Unit Loads 40" x 48" Pallets, Skids, Runners, or Pallet-Type Base
- MIL-STD-1186 - Cushioning, Anchoring, Bracing, Blocking, and Waterproofing; With Appropriate Test Methods

2.1.2 Other Government documents, drawings and publications. The following other Government documents, drawings, and publications form a part of this specification to the extent specified herein.

DOD 4145.19-R-1 - Storage and Materiels Handling

(Copies of specifications, standards, handbooks, drawings, and publications required by suppliers in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

2.2 Other publications. The following document(s) form a part of this specification to the extent specified herein. The issues of the documents which are indicated as DoD adopted shall be the issue listed in the current DoDISS and the supplement thereto, if applicable.

AMERICAN SOCIETY FOR TESTING AND MATERIELS (ASTM)

D3951-82 Standard Practice For Commercial Packaging

(Application for copies of ASTM Publications should be addressed to the American Society for Testing Materiels, 1916 Race Street, Philadelphia, PA 19103.)

## MIL-B-45977A(AL)

(Industry Association specifications and standards 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 specification and the references cited herein, the text of this specification shall take precedence.

### 3 REQUIREMENTS

3.1 First article. When specified (see 6.2), the supplier shall furnish one complete pack for first article inspection. The first article may be either a preproduction pack or an initial production pack which conforms to the requirements of this specification. In either case, the approved first article and the production packs shall be identical and in accordance with the terms of the contract. Approval of the first article shall not relieve the supplier of the responsibility to furnish equipment in accordance with the requirements of this specification.

3.2 Processing conditions. Preservation and packing shall be accomplished within buildings which have facilities to limit the accumulation of dust and moisture on the equipment being processed. Bins, cabinets, shelving, and worktables brought into processing areas from outside shall be allowed sufficient time to reach ambient temperature before processing. Cleaning, drying, and application of preservatives shall progress in an uninterrupted series of operations. When periods of interruption are necessary, temporary protection shall be provided the partially processed items, as required, to assure against contamination.

3.3 Preservation. Preservation shall be level A or industrial, as specified (see 6.2).

#### 3.3.1 Level A.

3.3.1.1 General requirements. Bins, cabinets, shelving, and worktables shall be cleaned, dried, and preserved as specified herein. Parts and assemblies which are not covered by this specification shall be cleaned, dried and preserved utilizing the materials and methods specified for similar parts and assemblies described herein. Methods of preservation specified herein shall conform to the criteria and guidelines of MIL-P-116. (The fundamental principles and approved methods and techniques of preservation and packing are prescribed in 6.5.)

3.3.1.2 Materials. Materials used in cleaning, drying, and preserving bins, cabinets, shelving, and worktables shall be as specified herein. Materials shall be new and free from all defects and imperfections which may affect the serviceability of the completed package.

3.3.1.3 Disassembly and match markings. Disassembly requirements and match marking of bins, cabinets, shelving, and worktables shall be in accordance with MIL-STD-1186. The type of tags used for match marking and the method of application shall be in accordance with MIL-STD-129.

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3.3.1.4 Cleaning and drying. Noncritical ferrous metal surfaces shall be cleaned in accordance with process C-1 and dried in accordance with applicable procedures of MIL-P-116. Critical surfaces (screw-threads and bearing surfaces) shall be cleaned in accordance with process C-5 and dried in accordance with applicable procedures of MIL-P-116.

3.3.1.5 Assembly hardware (nuts, bolts, washers, etc.). The assembly hardware shall be processed method I. The hardware shall be coated with a P-7 preservative. The hardware shall be consolidated in suitable quantities and placed in bags conforming to type I, class C, style 1 of MIL-B-117.

3.3.1.6 Small miscellaneous components. Small miscellaneous components shall be grouped in suitable quantities interleaved, wrapped, or protected by some other applicable means to prevent marring of the painted surfaces. Unpainted ferrous metal components shall be coated with a P-1 or P-19 preservative.

3.3.1.7 Locks and keys. Lock and key mechanisms shall be coated with graphite conforming to SS-G-659 or a commercial powdered graphite. The locks shall be operated to assure penetration of the graphite within the mechanism of the lock. Seal the key openings with tape conforming to PPP-T-60, type III. The key(s) shall be packaged IC-1 and secured in a location on the cabinet adjacent to the lock with tape conforming to PPP-T-60, type III, class optional.

3.3.1.8 Technical data. Technical publications furnished with equipment shall be processed method IC-1. The package shall be secured to the basic unit in a conspicuous location with tape conforming to PPP-T-60, type III, class optional.

3.3.1.9 Consolidated package. The assembly hardware as specified in 3.3.1.5 and other small miscellaneous components as specified in 3.3.1.6 shall be consolidated and placed in a corrugated fiberboard box conforming to PPP-B-636, class weather-resistant. The components shall be cushioned with material conforming to PPP-C-795, Class 1, or PPP-C-1797. The box shall be closed in accordance with the appendix to the box specification.

3.3.1.10 Bins, rotary. The rotary bin shelve section, with detachable components removed, shall be disassembled from the tube column. All ferrous, unplated, or unpainted metal surfaces shall be preserved with P-1 or P-19 preservative. Removable bearings shall be coated with type P-11 preservative and processed method IA-8. The disassembled and detached components of the rotary bin shall be placed in boxes conforming to PPP-B-636, class weather-resistant. The components shall be immobilized with pads, cells, or cut shapes fabricated from weather-resistant corrugated fiberboard conforming to PPP-F-320, variety and grade optional or from cushioning material conforming to PPP-C-795, Class 1, or PPP-C-1797. Painted components shall be interleaved with sheets of plastic conforming to L-P-378, type and class optional to prevent marring of painted surfaces. The fiberboard boxes shall be closed in accordance with the appendix to the box specification.

3.3.1.11 Shelving. Unpainted shelving surfaces exposed by disassembly shall be coated with P-1 or P-19 preservative. Disassembled components shall be grouped together in bundles and secured with tape conforming to PPP-T-97, type III, width optional. Components shall be interleaved with sheets of plastic conforming to L-P-378, type and class optional to prevent marring of painted surfaces.

3.3.1.11.1 Shelf boxes. A maximum of 12 shelf boxes shall be packed in a snug-fitting fiberboard box conforming to PPP-B-636, style optional, class weather-resistant. The fiberboard box shall be closed in accordance with the appendix to the box specification.

3.3.1.12 Cabinets (assembled or disassembled). Latches and other operational surfaces shall be preserved with type P-11 preservative. Tops of cabinets fabricated from wood, hardboard, or particleboard shall be shrouded with plastic material conforming to L-P-378, type and class optional. The shroud shall be secured in place with tape conforming to PPP-T-60, type III, class optional. Components of disassembled cabinets shall be grouped together in bundles and secured with tape conforming to PPP-T-97, type III, width optional. Components shall be interleaved with sheets of plastic material conforming to L-P-378, type and class optional to prevent marring of the painted surfaces. Assembled or disassembled cabinets not exceeding 90 pounds gross weight or having a total dimension of 90 inches (length, width, and depth added) shall be processed method III, utilizing a fiberboard box conforming to PPP-B-636, class weather-resistant as the unit container. The cabinets shall be immobilized in fiberboard boxes with pads, cells, or cut shapes fabricated from weather-resistant corrugated fiberboard conforming to PPP-F-320, variety and grade optional. Cabinets exceeding these requirements shall be packed according to paragraph 3.4.2 or 3.4.3. Doors of assembled cabinets shall be closed and latched. Locking bars shall be in place and secured with facilities provided. The fiberboard box shall be closed in accordance with the appendix to the box specification.

3.3.1.13 Worktables (assembled). Worktables shall be processed method I. Operational guide surfaces of drawers shall be coated with type P-11 preservative. Drawers shall be secured in a closed position. Tops of worktables fabricated from wood, hardboard, or particleboard shall be shrouded with plastic material conforming to L-P-378, type and class optional. The shroud shall be secured in place with tape conforming to PPP-T-60, type III, class optional.

3.3.1.14 Worktables (folding legs, portable). Worktables shall be processed method III. Each table, with legs folded and locked in closed position, shall be placed in a snug-fitting box conforming to PPP-B-636, class weather-resistant. Dimensional limitations of the fiberboard box shall be waived. The worktable shall be immobilized in the fiberboard box with pads, cells, or cut shapes fabricated from weather-resistant corrugated fiberboard conforming to PPP-F-320, variety and grade optional. The fiberboard box shall be closed in accordance with the appendix to the specification.

3.3.2 Industrial. Bins, cabinets, worktables, and shelving shall be preserved in accordance with ASTM D3951-82.

3.4 Packing. Packing shall be level A or B, or industrial, as specified (see 6.2).

3.4.1 General requirements for levels A and B. Shipping containers shall be uniform in size and construction.

3.4.1.1 Selection of container. Selection of container shall be governed by the size and weight limitations of the applicable container specification.



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3.4.1.2 Cushioning, blocking, and bracing. Arrangement of contents, cushioning, blocking, and bracing shall be in accordance with MIL-STD-1186.

3.4.1.3 Closure and strapping. Closure and strapping of shipping containers shall be in accordance with the appendix of the applicable shipping container specification.

3.4.2 Level A. Unless otherwise specified (see 6.2), bins, cabinets, shelving, and worktables preserved as specified in 3.3 shall be individually packed in a shipping container conforming to PPP-B-701, overseas type, style optional, grade B; or PPP-B-621, class 2, style optional; or PPP-B-585, class 3, style 2. Units weighing less than 90 pounds, shall be consolidated in wooden containers as specified, providing they do not exceed the maximum weight requirement.

3.4.3 Level B. Unless otherwise specified (see 6.2), bins, cabinets, shelving, and worktables preserved as specified in 3.3 shall be individually packed in a shipping container conforming to PPP-B-601, domestic type, style optional; PPP-B-621, class 1, style optional; PPP-B-585, class and style optional; or PPP-B-640, class 2. The selection of the shipping container shall be governed by the size and weight limitations of the applicable container specification. Items packaged in PPP-B-636 may not require overpacking.

3.4.4 Industrial. Industrially preserved supplies and equipment shall be packed in accordance with requirements of ASTM D3951-82.

3.4.5 Unitization. When specified (see 6.2), shipments shall be palletized in accordance with MIL-STD-147.

3.5 Storage. Items shall be stored in accordance with DoD 4145.19-R-1, storage and materials handling.

### 3.6 Marking.

3.6.1 Military. When military levels of protection are specified, marking shall be in accordance with MIL-STD-129. Special marking shall be as required by contract or purchase order.

3.6.2 Industrial. When industrial packaging is specified, marking shall be in accordance with ASTM D3951-82.

3.7 Workmanship. Standards of workmanship shall be such as to assure preservation and packing of a neat uniform general appearance in compliance with the requirements of section 3. Workmanship shall be of the best industrial practice. Defects, imperfections, or omissions which would tend to impair the effectiveness of the completed pack or part thereof shall not be permitted.

## 4 QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the supplier is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified, the supplier may utilize his own facilities or any commercial laboratory acceptable to the Government. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to assure that supplies and services conform to prescribed requirements.

## 4.2 Classification of inspection. Inspection shall be classified as follows:

- a. First article inspection (see 4.2.1).
- b. Quality conformance inspection (see 4.2.2).

4.2.1 First article inspection. When a first article sample is required by the contract or purchase order, the supplier shall subject the first article pack to first article inspection and tests specified in MIL-P-116 to determine conformance with the requirements of the specification. When specified (see 6.2), first article packages shall be subjected to the rough handling and cyclic exposure test(s) (one or both) as contained in the first article inspection requirements of MIL-P-116. Failure of the first article to pass any of the tests shall be cause for rejection.

4.2.2 Quality conformance inspection. Quality conformance inspection shall be applied in all cases for acceptance under the contract or purchase order. Quality conformance inspection shall consist of the applicable examinations and tests specified in MIL-P-116, with sampling to be conducted in accordance with MIL-STD-105 at the inspection level and acceptable quality level (AQL) specified in MIL-P-116. When specified (see 6.2), the packages shall be subjected to rough handling and cyclic exposure tests(s) (one or both) as contained in the quality conformance inspection requirements of MIL-P-116.

4.3 Packing inspection. Inspection of packing, marking and unitization shall be in accordance with applicable specification and packing level requirements specified in the contract or purchase order.

## 5 PACKAGING

5.1 This section is not applicable to this specification.

## 6 NOTES

6.1 Intended use. This specification is intended to be used for reference in section 5 of commodity specifications or direct reference in contracts or orders. The preservation, packing, and marking requirements specified herein are intended to insure proper and safe storage and transportation of bins, cabinets, shelving, and worktables for direct shipment to Government activities or shipments to be processed at a military activity or agency.

6.2 Ordering data. Procurement documents should specify the following:

- a. Title, number, and date of this specification.
- b. First article inspection, when required (see 3.1).
- c. Specify level A or industrial preservation (see 3.3);  
Specify level A or B, or industrial packing (see 3.4).
- d. Selection of shipping container to be utilized, if different  
(see 3.4.2 and 3.4.3).
- e. Unitization (see 3.4.5).
- f. Special marking, if required (see 3.5).
- g. Rough handling and cyclic exposure tests, if required  
(see 4.2.1 and 4.2.2).

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6.3 General information. A first article inspection test will not be required when:

- a. Industrial preservation and packing is specified.
- b. The procuring activity waives first article inspection tests after establishing that prior successful first article tests have been conducted on items similar in all respects to the new item and its packaging details.
- c. For other reasons waived by the procuring agency.

6.4 Bins, cabinets, shelving, and worktables. Bins, cabinets, shelving, and worktables are equipment that is used for purpose of storing, filing, and work facilities.

6.4.1 Related equipment. The following groups listed herein are considered as applicable to this specification:

- a. Bins, solid circular base (maintenance).
- b. Bins, two-tube fitting (shipboard).
- c. Cabinets, wood top, folding legs.
- d. Cabinets, all steel.
- e. Cabinets, steel, with locks (disassembled and assembled).
- f. Cabinets, steel, with wood tops.
- g. Shelving, storage and display, steel, clip type.
- h. Shelving, storage and display, steel, boltless.
- i. Shelving, storage and display, steel, interchangeable, nut and bolt type.
- j. Worktables, steel top, folding legs.
- k. Worktables, wood top, folding steel legs.
- l. Worktables, steel, stationary.
- m. Worktables, wood, stationary.
- n. Worktables, steel, with wood tops (Shelves, drawers, etc.) stationary.

6.5 Supplemental information. Supplemental information on preservation and packing may be found in the following Government publication:

- a. Packaging of Materiel: Preservation (Vol I) Army  
TM 38-230-1, Navy - NAVSUP PUB 502, Air Force - AFP 71-15.
- b. Packaging of Materiel: Packing (Vol II) Army TM 38-230-2,  
Navy - NAVSUP PUB 503, Air Force - AFP 71-16.

(Copies of the above document may be obtained from Superintendent of Documents, US Government Printing Office, Washington, DC 20402.)



6.6 Disposability methods. Environmental pollution preventive measures are contained in the materials' specifications indicated herein. Refer to the materials' specifications (or preparing activity) for recommended disposability methods.

Custodians:

Army - AL  
Navy - YD  
Air Force - 99

Preparing activity:

Army - AL

Project No. PACK-0702

Review activity:

Army - SM

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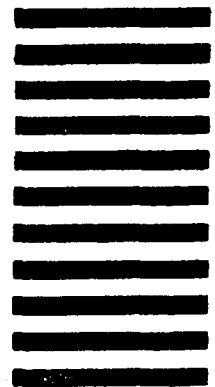


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1. DOCUMENT NUMBER		2. DOCUMENT TITLE	
3a. NAME OF SUBMITTING ORGANIZATION		4. TYPE OF ORGANIZATION (Mark one)	
b. ADDRESS (Street, City, State, ZIP Code)		<input type="checkbox"/> VENDOR	
		<input type="checkbox"/> USER	
		<input type="checkbox"/> 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)	

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