



Designation: D3951 – 18

Standard Practice for Commercial Packaging¹

This standard is issued under the fixed designation D3951; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

This standard has been approved for use by agencies of the U.S. Department of Defense.

1. Scope

1.1 This practice establishes minimum requirements for packaging of supplies and equipment, exclusive of ammunition, explosives, or hazardous materials, as covered in Title 49 of the Code of Federal Regulations.

1.2 The values stated in inch-pound units are to be regarded as standard. No other units of measurement are included in this standard.

1.3 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.4 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 ASTM Standards:²

D996 Terminology of Packaging and Distribution Environments

D1974/D1974M Practice for Methods of Closing, Sealing, and Reinforcing Fiberboard Boxes

D4169 Practice for Performance Testing of Shipping Containers and Systems

D4727/D4727M Specification for Corrugated and Solid Fiberboard Sheet Stock (Container Grade) and Cut Shapes

D5118/D5118M Practice for Fabrication of Fiberboard Shipping Boxes

D5168 Practice for Fabrication and Closure of Triple-Wall Corrugated Fiberboard Containers

D5445 Practice for Pictorial Markings for Handling of Goods

D6039/D6039M Specification for Open and Covered Wood Crates

D6251/D6251M Specification for Wood-Cleated Panelboard Shipping Boxes

D6254/D6254M Specification for Wirebound Pallet-Type Wood Boxes

D6255/D6255M Specification for Steel or Aluminum Slotted Angle Crates

D6256/D6256M Specification for Wood-Cleated Shipping Boxes with Skidded, Load-Bearing Bases

D6880/D6880M Specification for Wood Boxes

D7478/D7478M Specification for Heavy Duty Sheathed Wood Crates

2.2 Code of Federal Regulations:³

Title 49 Transportation (Parts 100 to 199)

2.3 Military and Federal Standards:⁴

MIL-STD-129 Military Marking for Shipment and Storage

MIL-STD-147 Palletized Unit Loads

MIL-STD-2073-1 Standard Practice for Military Packaging

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

2.4 International Standards:⁵

ISPM Publication No. 15 Regulation of Wood Packaging Material in International Trade (International Standards for Phytosanitary Measures (ISPM))

3. Terminology

3.1 Terminology found in Terminology **D996** shall apply.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 **CONUS**—Continental United States (excluding Hawaii and Alaska).

¹ This practice is under the jurisdiction of ASTM Committee **D10** on Packaging and is the direct responsibility of Subcommittee **D10.27** on Fiberboard Shipping Containers, Containerboard and Related Structures and Materials.

Current edition approved May 1, 2018. Published July 2018. Originally approved in 1980. Last previous edition approved in 2015 as D3951 – 15. DOI: 10.1520/D3951-18.

² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

³ Available from Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

⁴ Available from Document Automation and Production Service, Building 4/D, 700 Robbins Avenue, Philadelphia, PA 19111-5094. <http://assist.daps.dla.mil/quicksearch..>

⁵ Available from the International Plant Protection Convention at http://www.aphis.usda.gov/import_export/plants/plant_exports/wpm/index.shtml.

3.2.2 *immediate use*—used or consumed within seven days of receipt.

3.2.3 *safe delivery—in packaging*—delivery of a shipment to its destination with minimal damage to the package and no damage to the contents.

4. Significance and Use

4.1 This practice covers the requirements for the commercial preservation, packaging, packing (exterior container), unitization, and marking for supplies and equipment. It provides for multiple handling and shipment by any mode, and storage periods of a minimum of one year in enclosed facilities without degradation or damage to the product within the container. It also provides for package quantities suitable for redistribution without additional repackaging or marking. Planned storage that exceeds one year requires more than minimum requirements for physical and mechanical protection.

4.2 This practice is applicable to Department of Defense shipments for:

- 4.2.1 Items intended for immediate use;
- 4.2.2 Items for not-mission-capable supply;
- 4.2.3 Items intended for depot operational consumption;
- 4.2.4 Small parcel shipments (CONUS), not-for-stock; and
- 4.2.5 Direct vendor deliveries (CONUS ONLY).

4.3 All other Department of Defense shipments shall be in accordance with MIL-STD-2073-1.

5. Requirements

5.1 *General*—The following requirements, unless specifically changed by the contract or order, shall apply. Suppliers are encouraged to use advanced packaging technology.

5.1.1 *Packaging*—Preservation, packaging, packing, and marking furnished by the suppliers shall meet or exceed the following minimum requirements:

5.1.1.1 *Cleanliness*—Items shall be free of dirt and other contaminants which would contribute to deterioration of the item or which would require cleaning by the customer prior to use. Coatings and preservatives applied to the item for protection are not considered contaminants.

5.1.1.2 *Preservation*—Items susceptible to corrosion or deterioration shall be provided protection such as preservative

coatings, barrier protection, volatile corrosion inhibitors, or desiccated unit packs.

5.1.1.3 *Cushioning*—Items requiring protection from physical and mechanical damage or which are fragile shall be protected by wrapping, cushioning, pack compartmentization, cartonizing, or other means to mitigate shock and vibration to prevent damage during handling and shipment.

5.1.1.4 *Loose-fill Cushioning/Dunnage*—Loose-fill material shall be prohibited for all Department of Defense (DoD) and/or General Services Administration (GSA) shipments and shipments to aerospace facilities.

5.1.2 *Unit Package*:

5.1.2.1 *Unit Package*—A unit package shall be so designed and constructed that it will contain the contents with no damage to them, and with minimal damage to the unit pack during shipment and storage in the shipping container configuration, and shall allow subsequent handling.

5.1.2.2 *Unit Package Quantity*—Unless otherwise specified in the contract or purchase order, the unit package quantity shall be one each part, set, or assembly, except for small lightweight items, for example, industrial hardware, which will be unit packaged in quantities that are standard in the trade and suitable for retail sales. Single items weighing over 5 lb shall be individually packaged.

5.1.2.3 Bulk packaging shall be specifically excluded unless specified in the contract or purchase order.

5.1.3 *Intermediate Package*:

5.1.3.1 The use of intermediate packaging is encouraged particularly when such use enhances handling and storage.

5.1.4 *Packing*:

5.1.4.1 Unit packages and intermediate packages not meeting the requirements for a shipping container shall be packed in shipping containers.

5.1.4.2 *Shipping Containers*—The shipping container (including any necessary blocking, bracing, cushioning, or water resistance) shall comply with the regulations of the carrier used and shall provide safe delivery to the destination. The shipping container shall be capable of multiple handling and storage periods at a minimum of one year in enclosed facilities without degradation or damage to the product. **Table 1** provides suggested size and weight limits for shipping containers and may be used for unit and intermediate packages when specifying a fiberboard container, wood box, or crate.

TABLE 1 Weight and Size Limits of Shipping Containers

Container Standard	Maximum Outside Dimensions, length + width + depth	Maximum Weight of Boxes and Contents (lb)
Practice D5118/D5118M	SW Corrugated ≥ 40 and ≤ 105 in. DW Corrugated ≥ 85 and ≤ 120 in. TW Corrugated ≥ 110 and ≤ 125 in.	≤ 120 ≤ 180 ≤ 300
Practice D5168	As required	≤ 1000
Specification D6251/D6251M^A	As required	≤ 1000
Specification D6880/D6880M^A	As required	≤ 1000
Specification D6256/D6256M^A	≤ 16 ft	≤ 2500
Specification D6254/D6254M^A	As required	≤ 2500
Specification D6255/D6255M^A	As required	≤ 3000
Specification D6039/D6039M^A	As required	≤ 4000
Specification D7478/D7478M^A	30 ft L \times 9 ft W \times 10 ft H	$\leq 30\ 000$

^A Containers with length and width greater than 48 in. shall be designed with four-way entry lift capability. Containers with gross weight over 100 lb shall have 2-way forklift entry at a minimum.