



Standard Practice for Performance Testing of Shipping Containers and Systems¹

This standard is issued under the fixed designation D4169; 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 provides a uniform basis of evaluating, in a laboratory, the ability of shipping units to withstand the distribution environment. This is accomplished by subjecting them to a test plan consisting of a sequence of anticipated hazard elements encountered in various distribution cycles. This practice is not intended to supplant material specifications or existing preshipment test procedures.

1.2 Consider the use of Practice **D7386** for testing of packages for single parcel shipments.

1.3 The suitability of this practice for use with hazardous materials has not been determined.

1.4 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.5 *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 and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:²

D642 Test Method for Determining Compressive Resistance of Shipping Containers, Components, and Unit Loads

D880 Test Method for Impact Testing for Shipping Containers and Systems

D951 Test Method for Water Resistance of Shipping Containers by Spray Method

D996 Terminology of Packaging and Distribution Environments

D999 Test Methods for Vibration Testing of Shipping Containers

D4003 Test Methods for Programmable Horizontal Impact Test for Shipping Containers and Systems

D4332 Practice for Conditioning Containers, Packages, or Packaging Components for Testing

D4728 Test Method for Random Vibration Testing of Shipping Containers

D5265 Test Method for Bridge Impact Testing

D5276 Test Method for Drop Test of Loaded Containers by Free Fall

D5277 Test Method for Performing Programmed Horizontal Impacts Using an Inclined Impact Tester

D5487 Test Method for Simulated Drop of Loaded Containers by Shock Machines

D6055 Test Methods for Mechanical Handling of Unitized Loads and Large Shipping Cases and Crates

D6179 Test Methods for Rough Handling of Unitized Loads and Large Shipping Cases and Crates

D6344 Test Method for Concentrated Impacts to Transport Packages

D6653 Test Methods for Determining the Effects of High Altitude on Packaging Systems by Vacuum Method

D7386 Practice for Performance Testing of Packages for Single Parcel Delivery Systems

F1327 Terminology Relating to Barrier Materials for Medical Packaging (Withdrawn 2007)³

2.2 Military Standards:⁴

MIL-STD-810F Environmental Test Methods

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

2.3 Association of American Railroads Standards:⁵

General Information Bulletin No. 2 Rules and Procedures for Testing of New Loading and Bracing Methods or Materials

¹ This practice is under the jurisdiction of ASTM Committee **D10** on Packaging and is the direct responsibility of Subcommittee **D10.21** on Shipping Containers and Systems - Application of Performance Test Methods.

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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 The last approved version of this historical standard is referenced on www.astm.org.

⁴ Available from Standardization Documents Order Desk, DODSSP, Bldg. 4, Section D, 700 Robbins Ave., Philadelphia, PA 19111-5098, <http://dodssp.daps.dla.mil>.

⁵ Available from Association of American Railroads (AAR), 425 Third St., SW, Washington, DC 20024, <http://www.aar.org>.

*A Summary of Changes section appears at the end of this standard