



Standard Test Method for Drop Test of Loaded Containers by Free Fall¹

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1. Scope

1.1 This test method covers procedures for the drop testing of loaded boxes, cylindrical containers, and bags and sacks by the free-fall method.

1.2 For containers not exceeding 110 lb (50 kg), this test method fulfills the requirements of ISO Standards 2206:1987 and 2248:1985. **Caution**—These ISO standards may describe procedures that do not meet the requirements for this test method.

1.3 The values stated in inch-pound units are to be regarded as the standard. The values given in parentheses are for information only.

1.4 *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

- D 585 Practice for Sampling and Accepting a Single Lot of Paper, Paperboard, Fiberboard, and Related Product
- D 644 Test Method for Moisture Content of Paper and Paperboard by Oven Drying
- D 880 Test Method for Impact Testing for Shipping Containers and Systems
- D 996 Terminology of Packaging and Distribution Environments
- D 2463 Test Method for Drop Impact Resistance of Blow-Molded Thermoplastic Containers
- D 4003 Test Methods for Programmable Horizontal Impact Test for Shipping Containers and Systems
- D 4169 Practice for Performance Testing of Shipping Containers and Systems
- D 4332 Practice for Conditioning Containers, Packages, or

Packaging Components for Testing

- D 6055 Test Methods for Mechanical Handling of Unitized Loads and Large Shipping Cases and Crates
- D 6179 Test Methods for Rough Handling of Unitized Loads and Large Shipping Cases and Crates
- E 122 Practice for Choice of Sample Size to Estimate a Measure of Quality for a Lot or Process
- E 680 Test Method for Drop Weight Impact Sensitivity of Solid-Phase Hazardous Materials

2.2 ISO Standards:

- ISO 2206 Packaging—Complete Filled Transport Packages, Identification of Parts When Testing³
- ISO 2248 Packaging—Complete Filled Transport Packages, Vertical Impact Test by Dropping³

2.3 Code of Federal Regulations:

- Title 49 —Transportation (49 CFR)⁴

3. Terminology

3.1 **Definitions**—General terms for packaging and distribution environments are found in Terminology D 996.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 **cylinder**—for the purposes of this test method, a cylinder includes substantially cylindrical containers such as barrels, drums, kegs, and pails (fiber, metal, plastic, or wood, or combinations thereof).

3.2.2 **member**—a face, corner, or edge of a rectangular container; a chime, end, or sidewall of a cylindrical container; or a face, edge, corner, or butt of a bag or sack.

4. Significance and Use

4.1 This test method is intended for use in evaluating the capability of a container to withstand the sudden shock resulting from a free fall, or to evaluate the capability of a container and its inner packing to protect its contents during the sudden shock resulting from a free fall. This test method may also be used to compare the performance of different package designs. This test method may also permit observation of the progressive failure of a container and the damage to its contents.

¹ This test method is under the jurisdiction of ASTM Committee D10 on Packaging and is the direct responsibility of Subcommittee D10.22 on Handling and Transportation.

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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 Available from the American National Standards Institute, 11 W. 42nd St., 13th Floor., New York, NY 10036.

⁴ Available from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

