



Designation: D 6198 – 01

Standard Guide for Transport Packaging Design¹

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1. Scope

1.1 This guide covers an approach to design of packaging for distributing goods through the hazards of handling, storage, and transportation.

1.2 The principal content of this guide is the identification of the key steps involved in development of transport packages, including shipping containers, interior protective packaging, and unit loads. It is recognized that actual usage and application to individual design projects may vary appreciably without diminishing the value of the process. Consult with a packaging professional whenever needed.

1.3 This guide is not intended for design of primary packaging unless the primary package is planned for use as a shipping container.

1.4 The user of this guide must be aware of the carrier rules regarding packaging for shipment via each mode of transportation in which the transport package may move, such as the National Motor Freight Classification (less-than truckload) and the Uniform Freight Classification (railroad). For hazardous materials packaging, the packaging must perform to the requirements of the applicable modal regulations listed in Section 2.

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:

- D 642 Test Method for Determining Compressive Resistance of Shipping Containers, Components, and Unit Loads²
- D 880 Test Method for Impact Testing of Shipping Containers and Systems²
- D 996 Terminology of Packaging and Distribution Environments²
- D 999 Test Methods for Vibration Testing of Shipping Containers²

D 1974 Practice for Methods of Closing, Sealing, and Reinforcing Fiberboard Boxes²

D 3332 Test Methods for Mechanical-Shock Fragility of Products, Using Shock Machines²

D 3580 Test Method for Vibration (Vertical Linear Motion) Test of Products²

D 4003 Test Methods for Programmable Horizontal Impact Test for Shipping Containers and Systems²

D 4169 Practice for Performance Testing of Shipping Containers and Systems²

D 4728 Test Method for Random Vibration Testing of Shipping Containers²

D 4919 Specification for Testing of Hazardous Materials Packagings²

D 5276 Test Method for Drop Test of Loaded Containers by Free Fall²

D 5487 Test Method for Simulated Drop of Loaded Containers by Shock Machines²

D 6055 Test Methods for Mechanical Handling of Unitized Loads and Large Shipping Cases and Crates²

D 6179 Test Methods for Rough Handling of Unitized Loads and Large Shipping Cases and Crates²

D 6344 Test Method for Concentrated Impacts to Transport Packages²

D 6537 Practice for Instrumented Package Shock Testing for Determination of Package Performance²

2.2 ISO Standard:

ISO 4180 Complete Filled Transport Packages—General Rules for the Compilation of Performance Test Schedules³

2.3 Other Documents:

National Motor Freight Classification⁴

Uniform Freight Classification, Rail Publication Service⁵

International Civil Aviation Organization Technical Instructions for the Safe Transport of Dangerous Goods by Air⁶

IMDG Code, International Maritime Dangerous Goods Code⁷

¹ This guide is under the jurisdiction of ASTM Committee D10 on Packaging and is the direct responsibility of Subcommittee D10.21 on Application of Performance Test Methods.

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² *Annual Book of ASTM Standards*, Vol 15.09.

³ Available from American National Standards Institute, 25 W. 43rd St., 4th Floor, New York, NY 10036.

⁴ Available from National Motor Freight Traffic Association, Inc., American Trucking Associations, 2200 Mill Road, Alexandria, VA 22314.

⁵ Available from 151 Ellis Street NE, Suite 200, Atlanta, GA, 33035-6021.

⁶ Available from ICAO, Suite 400, 1000 Sherbrooke St. W., Montreal, Quebec, H3A 2R2 Canada.

⁷ Available from International Marine Organization, 4 Albert Embankment, London, Ontario SE1 7SR Canada.