



Designation: D6537 – 00 (Reapproved 2021)

Standard Practice for Instrumented Package Shock Testing For Determination of Package Performance¹

This standard is issued under the fixed designation D6537; 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.

1. Scope

1.1 This practice covers methods for obtaining measured shock responses using instrumentation for an actual or simulated product package system when subjected to defined shock inputs to measure package performance.

1.2 This practice establishes methods for obtaining measured shock data for use with shock and impact test methods. It is not intended as a substitute for performance testing of shipping containers and systems such as Practice [D4169](#).

1.3 This practice will address acceleration measuring techniques. Other ways of measuring shock impacts, such as high speed video, are not covered by this practice.

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

1.5 *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

[D3332](#) Test Methods for Mechanical-Shock Fragility of Products, Using Shock Machines

[D4003](#) Test Methods for Programmable Horizontal Impact Test for Shipping Containers and Systems

[D4169](#) Practice for Performance Testing of Shipping Containers and Systems

[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

2.2 ISO Standard:

[10012](#) Quality Assurance for Measuring Equipment³

3. Terminology

3.1 Definitions:

3.1.1 General definitions for packaging and distribution are found in Terminology [D996](#).

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *accelerometer, n*—a sensor that converts acceleration into a proportional electric signal for measurement.

3.2.2 *coefficient of restitution, n*—the ratio of the rebound velocity to the impact velocity.

3.2.3 *complex waveform, n*—acceleration versus time graph representing the responses of many different spring/mass systems when subjected to an impact. Also referred to as a complex shock-pulse.

3.2.4 *faired acceleration, n*—the amplitude representing the primary or intended response system in a complex shock pulse.

3.2.5 *fairing, n*—the graphical smoothing of a recorded pulse by visually estimating the amplitude of the primary waveform when high frequency responses are also present.

3.2.6 *peak acceleration, n*—the maximum absolute value of acceleration which occurred during the shock pulse.

¹ This practice is under the jurisdiction of ASTM Committee [D10](#) on Packaging and is the direct responsibility of Subcommittee [D10.13](#) on Interior Packaging.

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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 American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, <http://www.ansi.org>.