



Standard Test Method for Evaluation of Horizontal Impact Performance of Load Unitizing Stretch Wrap Films¹

This standard is issued under the fixed designation D 5414; 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 test method is used to evaluate and compare the ability of stretch-wrap films to survive horizontal impacts in a laboratory simulation.

1.2 The test levels may be varied to represent the mode of shipping and handling used for the unit load under test.

1.3 The methodology of performing the controlled horizontal impacts is described in detail in Methods D 4003. This test method will describe only sample preparation and evaluation in the special case of evaluating the performance of film for load unitizing.

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:

D 996 Terminology of Packaging and Distribution Environments²

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

3. Terminology

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

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *backload*—a duplicate specimen similar to the test package or weights to simulate the other lading in the transport vehicle.

3.2.2 *shock pulse programmer*—a device used to control the parameters of the acceleration versus time-shock pulse generated by a shock test impact machine.

4. Summary of Test Method

4.1 The horizontal impacts used in this test method are programmed shock inputs that represent the hazards as they occur in the shipping and handling environment. The environmental hazards may include rail switching impacts, pallet marshalling impacts, etc.

5. Significance and Use

5.1 This test method is intended to be used mainly as a means of comparing the performance of unitizing films. It can also be used to compare the effectiveness of different wrap cycles with the same wrapping materials. No direct correlation between these tests results and actual field performance has been established.

5.2 This test method simulates the horizontal impact elements of the distribution environment. Horizontal impacts are encountered in rail car switching and pallet marshalling procedures, both in the warehouse and during the loading and unloading of transport vehicles.

5.3 This test method leaves open to the discretion of the user the establishment of test levels and the number of impacts constituting the test so that one might tailor the test to simulate one's particular distribution environment. The section entitled "Element H—Simulated Rail Switching" in Practice D 4169 may provide some guidance in this regard.

6. Apparatus

6.1 *Load Wrapping Apparatus*—A machine or apparatus to wrap the test load. The method of wrap application is preferably as near as possible to that used in an actual production situation (stretch wrapper or manual wrapping unit).

6.2 *Horizontal Impact Test Machine*—Refer to Methods D 4003, paragraph 5.1 and following subparagraphs, for a complete description.

6.3 *Instrumentation*—Refer to Methods D 4003, paragraph 5.3 and following subparagraphs, for a complete description.

7. Procedure

7.1 Procedure A—Normal Test Mode:

7.1.1 Prepare the test load. Arrange the units comprising the test load in layers and stack them on the pallet or slip sheet in the normal manner.

7.1.2 Wrap the test load with the unitizing film at a

¹ This test method is under the jurisdiction of ASTM Committee D10 on Packaging and is the direct responsibility of Subcommittee D10.25 on Palletizing and Unitizing of Loads.

Current edition approved July 15, 1995. Published September 1995. Originally published as D 5414 – 93. Last previous edition D 5414 – 93.

² Annual Book of ASTM Standards, Vol 15.09.