Reusable Bag Test Method

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1. Scope

1.1 This test method covers the determination of the durability performance of a “Reusable bag" over a simulated test conditions for grocery bags. This test method is based on the Walking Test for Reusable Plastic Bags. “Reusable bag" means a bag with handles that is specifically designed and manufactured for multiple reuse and meets all of the following requirements:

- is machine washable or is made from a material that can be cleaned or disinfected;
- does not contain lead, cadmium, or any other heavy metal in toxic amounts, as defined by applicable state and federal standards and regulations for packaging or reusable bags;
- has printed on the bag, or on a tag that is permanently affixed to the bag,
    - the name of the manufacturer,
    - the location (country) where the bag was manufactured,
    - a statement that the bag does not contain lead, cadmium, or any other heavy metal in toxic amounts, and
    - the percentage of postconsumer recycled material used, if any;

1.2 Test method has a minimum lifetime of 125 uses, which for purposes of this subsection, means the capability of carrying a minimum of 22 pounds 125 times over a distance of at least 175 feet;

1.3 Test method has defined minimum volume of 15 liters.

1.4 Test method has defined film thickness of greater than 2.25 mils thick for plastic bags.

1.5 Test data obtained from this test method is relevant and appropriate for use in engineering design.

2. Reference Documents

- ASTM D5577-94(2010)e1 Standard Guide for Techniques to Separate and Identify Contaminants in Recycled Plastics
- ASTM D7192-10 Standard Test Method for High Speed Puncture Properties of Plastic Films Using Load and Displacement Sensors
- ASTM D7209-06 Standard Guide for Waste Reduction, Resource Recovery, and Use of Recycled Polymeric Materials and Products
- ASTM D618 Practice for Conditioning Plastics for Testing
- ASTM D883 Terminology Relating to Plastics
- ASTM D1004 Test Method for Tear Resistance
- ASTM D1600 Terminology for Abbreviated Terms Relating to Plastics
- ASTM D3763 Test Method for High Speed Puncture Properties of Plastics Using Load and Displacement Sensors
- ASTM D4000 Classification System for Specifying Plastic Materials
- ASTM D6988 Guide for Determination of Thickness of Plastic Film Test Specimens

3. Terminology
Definitions: are listed in Terminology ASTM D833 standard

4. Significance of Use

This test method is designed to provide pass or fail test of reusable plastic, paper, or cloth bags under essentially bag carrying loads of typical grocery items. This test method further provides a measure of durability performance of reusable plastic, paper, or cloth bags.

5. Apparatus

5.1 The testing machine shall consist of a reusable bas with 10 kg (22 pounds) of mass located in the bottom of the bag.

5.2 The 10 kg mass shall be rounded and made of puncture resistant material so as to not cause puncturing or tearing of the reusable bag.

5.3 Tape measure to measure 175 feet.

5.4 Colored chalk or tape for marking the starting point and 175 feet ending point.

5.5 Pencils and paper or other recording device.

6. Test Specimen

6.1 Reusable bag specimens must be large enough to have a minimum volume of 15 liters.

6.2 Reusable bag specimens must have a minimum thickness of 2.25 mils if plastic bag.

6.3 Reusable bag specimen must have handles that are specifically designed and manufactured for multiple reuse.

7. Conditioning

7.1 *Conditioning*—Condition the test specimens in an outdoor space at 25 +/- 5°C and 50 +/- 20 % relative humidity, in accordance with Procedure A of Practice D618 unless otherwise specified.

7.2 *Test Conditions*—Conduct tests in an outdoor space at 25 +/- 5°C and 50 +/- 20 % relative humidity, unless otherwise specified.

7.3 By changing the conditioning and test temperature in a controlled manner for a given test velocity, the temperature at which transition from ductile to brittle failure occurs can be determined for most plastic films.

8. Procedure

8.1 Test a minimum of two specimens at each specified condition.

8.2 Measure and record the thickness of each specimen to the nearest 0.0025 mm at the center of the specimen.

8.3 Place the 10 kg mass in the bottom center of the reusable plastic bag.

8.4 Mark off a starting point on the ground with markers, caulk, or tape.

8.5 Measure 175 feet and mark the ending point on the ground with markers, caulk, or tape.

8.6 Test walker slowly picks up one reusable bag in each hand that is filled with 10 kg (22 pounds) of mass or weights. The pick up speed must be less than 1 m per second.

8.7 Test walker walks at a pace of less than 2 m per second and more than 1 m per second.

8.8 Test walker will keep the bags at the side and not causing excessive swinging of the bags.

8.9 After 175 feet, the test walker gently places the bags on the ground and not cause scuffing of the bag on the ground.

8.10 The test walker can rest for up to 5 minutes.

8.11 The test walker picks up the bag and walks to the starting point according to procedure listed in sections 8.6 to 8.10.

8.12 After each trip, the number of 175 feet trips are recorded and any deterioration of the bag is recorded.

8.13 The test is concluded if the bag or handles tear or 125 trips are recorded.

9. Detailed Requirements

The plastic or product shall have concentrations of regulated heavy metals less than 50 % of those prescribed for sludges or composts in the country where the product is sold. Specifically in the United States, the regulated heavy metal concentrations are found in Table 3 of 40 CFR Part 503.13. The regulated heavy metals are as follows:

Table 1. Regulated heavy metal concentration (milligrams per kilogram)

Arsenic	41	Cadmium	39
Copper	1500	Lead	300
Mercury	17	Nickel	420
Selenium	100	Zinc	2800

10. Calculation

The test results are calculated with the following:

10.1 Pass/Fail of the 125 trips of 175 feet.

11. Report

11.1 Report the following information:

11.2 Complete identification of material tested, including but not limited to, plastic type, source, manufacturer's code number or product name, and plastic bag history.

11.3 Specimen size and thickness

11.4 Method of preparing samples for test

11.5 Outside ambient conditions of temperature and humidity of test conditions.

11.6 Procedure of test method

11.7 Results of reusable bags tests including number of trips completed, condition of reusable bag after test, identification of any tears, crack, crazing, or deformities in the tested bags.

11.8 Conclusions of the test

Precision and Bias
The precision and bias of the test method reporting laboratory will be deemed acceptable if it can be shown that the data are traceable to the primary standards and any uncertainties are identified and established.

Keywords
Plastic, bag, reusable, durability, regulated metals,