



Standard Test Method for Tear-Propagation Resistance of Plastic Film and Thin Sheeting by a Single-Tear Method¹

This standard is issued under the fixed designation D 1938; 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 covers the determination of the force necessary to propagate a tear in plastic film and thin sheeting (thickness of 1 mm (0.04 in.) or less) by a single-tear method.

1.2 The values stated in SI units are to be regarded as the standard. The values given in parentheses are for information only.

1.3 *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.*

NOTE 1—This standard and ISO 6383-1 are technically equivalent. However, the specimen size is larger for ISO 6383-1.

2. Referenced Documents

2.1 ASTM Standards:

D 374 Test Methods for Thickness of Solid Electrical Insulation²

D 618 Practice for Conditioning Plastics and Electrical Insulating Materials for Testing³

D 882 Test Methods for Tensile Properties of Thin Plastic Sheetings³

D 883 Terminology Relating to Plastics³

D 4000 Classification System for Specifying Plastic Materials⁴

E 4 Practices for Load Verification of Testing Machines⁵

E 691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method⁶

2.2 ISO Standard:

ISO 6383-1 Film and Sheetings—Determination of Tear Resistance Part 1 Trouser Tear Method⁷

3. Terminology

3.1 *Definitions:* Definitions of terms applying to this test method appear in Terminology D 883.

4. Summary of Test Method

4.1 The force to propagate a tear across a film or sheeting specimen is measured using a constant-rate-of-grip separation machine as described in Method A of Test Methods D 882. The force necessary to propagate the tear is interpreted from the load-time chart.

5. Significance and Use

5.1 This test method is of value in rating the tear-propagation force of various plastic films and thin sheeting of comparable thickness. The tear-propagation resistance in highly extensible film or sheeting is distinguished from the tear-propagation resistance in slightly extensible or nonextensible film or sheeting in Fig. 1 and Fig. 2 in 10.1 and 10.2, respectively.

5.2 This test method should be used for specification acceptance testing only after it has been demonstrated that the data for the particular material are acceptably reproducible.

5.3 The data obtained by this test method furnish information for ranking the tear-propagation resistance of plastic films and sheeting of similar composition. Actual use performance may not necessarily correlate with data from this test method. Sets of data from specimens of dissimilar thickness are usually not comparable.

5.4 For many materials, there may be a specification that requires the use of this test method, but with some procedural modifications that take precedence when adhering to the specification. Therefore, it is advisable to refer to that material specification before using this test method. Table 1 of Classification System D 4000 lists the ASTM materials standards that currently exist.

6. Apparatus

6.1 *Film-Testing Machine*, with a force-indicating head that can measure the load applied to tear the specimen. It should be equipped with a device for recording the load carried by the specimen and the amount of separation of the grips during the test. The testing machine shall be essentially free from inertia lag at the specified rate of testing and shall indicate the load

¹ This test method is under the jurisdiction of ASTM Committee D-20 on Plastics and is the direct responsibility of Subcommittee D20.10 on Mechanical Properties. Current edition approved Feb. 15, 1994. Published April 1994. Originally published as D 1938 – 62 T. Last previous edition D 1938 – 93.

² Annual Book of ASTM Standards, Vol 10.01.

³ Annual Book of ASTM Standards, Vol 08.01.

⁴ Annual Book of ASTM Standards, Vol 08.02.

⁵ Annual Book of ASTM Standards, Vol 03.01.

⁶ Annual Book of ASTM Standards, Vol 14.02.

⁷ Available from American National Standards Institute, 11 W. 42nd St., 13th Floor, New York, NY 10036.