



Standard Test Methods for Rubber Property—Brittleness Point of Flexible Polymers and Coated Fabrics¹

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This standard has been approved for use by agencies of the U.S. Department of Defense.

1. Scope

1.1 These test methods cover the determination of the lowest temperature at which rubber vulcanizates and rubber-coated fabrics will not exhibit fractures or coating cracks when subjected to specified impact conditions.

1.2 The values stated in SI units are to be regarded as 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.*

2. Referenced Documents

2.1 *ASTM Standards:*²

D751 Test Methods for Coated Fabrics

D832 Practice for Rubber Conditioning For Low Temperature Testing

D4483 Practice for Evaluating Precision for Test Method Standards in the Rubber and Carbon Black Manufacturing Industries

3. Summary of Test Methods

3.1 A specified number of specimens is given a single-impact under specified impact and temperature conditions until the temperature is found at which no failures occur. This is defined as the brittleness temperature.

3.2 There are four test methods:

3.2.1 *Test Method A*—The determination of the lowest temperature at which rubber vulcanizates will not fracture or crack (refer to 9.1).

3.2.2 *Test Method B*—The determination of the lowest temperature at which rubber-coated fabrics will not fracture or exhibit coating cracks (refer to 9.2).

3.2.3 *Test Method C*—Testing at a specified temperature and testing of materials from a supplier (refer to 9.3). This method is used for the classification of materials and for specification purposes.

3.2.4 *Test Method D*—The determination of 50 % brittleness temperature (refer to 9.4). This is the temperature at which 50 % of the specimens fail.

3.3 These tests may be performed either in a liquid heat transfer media or in a gaseous media (refer to 9.1.1.9).

4. Significance and Use

4.1 These test methods cover the evaluation of rubber materials or fabrics coated therewith subjected to low-temperature flex with an impact under well-defined conditions of striker speed. The response is largely dependent on effects of low temperatures such as crystallization, incompatibility of plasticizer, or the inherent dynamic behavior of the material itself. Data obtained by these test methods may be used to predict the product behavior in applications where the conditions are similar to those specified in these test methods.

4.2 These test methods have been found useful for specification and development purposes but do not necessarily indicate the lowest temperature at which the material may be used.

5. Apparatus

5.1 *Specimen Clamp*, designed so as to hold firmly the specimen(s) as cantilever beams (Fig. 1).

5.2 *Striker*—The edge of the striker shall have a radius of 1.6 ± 0.1 mm (0.063 ± 0.005 in.). The edge shall move relative to the specimen at a rectilinear speed of 2.0 ± 0.2 m/s (6.6 ± 0.6 ft/s) at impact and immediately after. The speed of the solenoid-activated striker should be frequently calibrated by the method described in the annex. Other types of testers

¹ These test methods are under the jurisdiction of ASTM Committee D11 on Rubber and are the direct responsibility of Subcommittee D11.10 on Physical Testing.

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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.