



Designation: D430 – 06 (Reapproved 2018)

Standard Test Methods for Rubber Deterioration—Dynamic Fatigue¹

This standard is issued under the fixed designation D430; 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.

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

1. Scope

1.1 These test methods cover testing procedures that estimate the ability of soft rubber materials to resist dynamic fatigue. No exact correlation between these test results and service is given or implied. This is due to the varied nature of service conditions. These test procedures do yield data that can be used for the comparative evaluation of rubber or composite rubber-fabric materials for their ability to resist dynamic fatigue.

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

1.4 *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

[D412 Test Methods for Vulcanized Rubber and Thermoplastic Elastomers—Tension](#)

[D1349 Practice for Rubber—Standard Conditions for Testing](#)

[D1682 Test Method for Breaking Load and Elongation of](#)

[Textile Fabric](#) (Withdrawn 1992)³

[D3183 Practice for Rubber—Preparation of Pieces for Test Purposes from Products](#)

[D3767 Practice for Rubber—Measurement of Dimensions](#)

[D4483 Practice for Evaluating Precision for Test Method Standards in the Rubber and Carbon Black Manufacturing Industries](#)

3. Summary of Test Methods

3.1 Three test methods are covered, using the following different types of apparatus:

3.1.1 *Method A*—Scott Flexing Machine.

3.1.2 *Method B*—DeMattia Flexing Machine.

3.1.3 *Method C*—E. I. DuPont de Nemours and Co. Flexing Machine.

3.1.4 The Scott flexing machine is used principally for tests of Type I, the DeMattia flexing machine for tests of Type II, while the DuPont apparatus is adapted to tests of either Type I or II, refer to [4.2](#).

4. Significance and Use

4.1 Tests for dynamic fatigue are designed to simulate the continually repeated distortions received in service by many rubber articles, such as tires, belts, footwear, and molded goods.

4.1.1 These distortions may be produced by extension, compressive, and bending forces or combinations thereof.

4.1.2 The effect of the distortions is to weaken the rubber until surface cracking or rupture occurs. Where rubber is combined with other flexible materials such as fabric, the effect may be evidenced by separation at the interface between the materials, caused either by breaking of the rubber or failure of the adhesion or both.

4.2 These tests are, therefore, of the following two types:

4.2.1 *Type I*—Tests designed to produce separation of rubber-fabric combinations by controlled bending of the specimens.

4.2.2 *Type II*—Tests designed to produce cracking on the surface of rubber by either repeated bending or extension as may occur in service.

¹ These test methods are under the jurisdiction of ASTM Committee D11 on Rubber and Rubber-like Materials and are the direct responsibility of Subcommittee D11.15 on Degradation Tests.

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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 The last approved version of this historical standard is referenced on www.astm.org.