



Standard Test Method for Rubber Property—Vulcanization Using Oscillating Disk Cure Meter¹

This standard is issued under the fixed designation D2084; 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 This test method covers the use of the oscillating disk cure meter for determining selected vulcanization characteristics of vulcanizable rubber compounds.

1.2 ISO 3417 is very similar to this test method. It has minor technical differences that are not considered to be significant.

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

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:²

- D1349 Practice for Rubber—Standard Conditions for Testing
- D3185 Test Methods for Rubber—Evaluation of SBR (Styrene-Butadiene Rubber) Including Mixtures With Oil
- D3186 Test Methods for Rubber—Evaluation of SBR (Styrene-Butadiene Rubber) Mixed With Carbon Black or Carbon Black and Oil
- D3187 Test Methods for Rubber—Evaluation of NBR (Acrylonitrile-Butadiene Rubber)
- D3190 Test Method for Rubber—Evaluation of Chloroprene Rubber (CR)
- D4483 Practice for Evaluating Precision for Test Method Standards in the Rubber and Carbon Black Manufacturing Industries

¹ This test method is under the jurisdiction of ASTM Committee D11 on Rubber and Rubber-like Materials and is the direct responsibility of Subcommittee D11.12 on Processability Tests.

Current edition approved Nov. 1, 2016. Published December 2016. Originally approved in 1971. Last previous edition approved in 2011 as D2084 – 11. DOI: 10.1520/D2084-11R16.

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.

2.2 ISO Standard:

ISO 3417 Rubber—Measurement of Vulcanization Characteristics With the Oscillating Disk Rheometer³

3. Terminology

3.1 Definitions of Terms Specific to This Standard:

3.1.1 The following measurements may be taken from the torque versus time curve (see Fig. 1).

3.1.2 *cure rate index*—measure of rate of vulcanization based on the difference between optimum vulcanization and incipient scorch time.

3.1.3 *peak cure rate*—measure of rate of vulcanization expressed as the maximum slope of the torque versus time curve.

3.1.4 *maximum, plateau, or highest torque*—measure of stiffness or shear modulus of the fully vulcanized test specimen at the vulcanization temperature.

3.1.5 *minimum torque*—measure of the stiffness of the unvulcanized test specimen taken at the lowest point of the curve.

3.1.6 *time to incipient cure (scorch time)*—measure of the time at which vulcanization begins.

3.1.7 *time to a percentage of full cure*—measure of cure based on the time to develop some percentage of the highest torque or difference in torque from the minimum.

3.1.8 *torque*—for an oscillating shear cure meter, the value measured by a torque transducer at the peak strain amplitude of the oscillating cycle.

3.1.9 *optimum cure time*—measure of the time required to reach a percentage of full cure that corresponds to a desired level of a property of the cured compound.

3.1.9.1 *Discussion*—The time to reach 90 % cure corresponds to a maximum in tensile strength for some rubber compounds. This does not apply in all cases.

³ Available from American National Standards Institute, 25 W. 43rd St., 4th Floor, New York, NY 10036.