



Designation: D3958 – 23

Standard Test Methods for Rubber—Evaluation of BIIR and CIIR (Halogenated Isobutene—Isoprene Rubber)¹

This standard is issued under the fixed designation D3958; 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 These test methods cover the standard materials, test formula, mixing procedures, and test methods for the evaluation of halogenated isobutene-isoprene rubbers (BIIR and CIIR).

1.2 Both mill and miniature internal mixer procedures are given.

1.3 The values stated in SI units are to be regarded as 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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.5 *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

D1646 Test Methods for Rubber—Viscosity, Stress Relaxation, and Pre-Vulcanization Characteristics (Mooney Viscometer)

D2084 Test Method for Rubber Property—Vulcanization Using Oscillating Disk Cure Meter

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 D11.23 on Synthetic Rubbers.

Current edition approved May 1, 2023. Published May 2023. Originally approved in 1980. Last previous edition approved in 2021 as D3958 – 06 (2021). DOI: 10.1520/D3958-23.

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.

D3182 Practice for Rubber—Materials, Equipment, and Procedures for Mixing Standard Compounds and Preparing Standard Vulcanized Sheets

D3896 Practice for Rubber From Synthetic Sources—Sampling

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

D5289 Test Method for Rubber Property—Vulcanization Using Rotorless Cure Meters

D6204 Test Method for Rubber—Measurement of Unvulcanized Rheological Properties Using Rotorless Shear Rheometers

3. Significance and Use

3.1 These tests are intended mainly for referee purpose but may be used for quality control of rubber production. They may also be used in research and development work and for comparison of different samples in a standard formula.

3.2 These tests may be used to obtain values for quality control acceptance of rubber.

4. Standard Test Formulas

4.1 *Standard Formulas*—See Table 1.

5. Sample Preparation

5.1 Obtain and prepare the test samples in accordance with Practice D3896.

6. Mixing Procedures

6.1 For general mixing procedures, refer to Practice D3182.

6.1.1 The compound may be prepared either on a mill, in a miniature internal mixer, or a lab internal mixer, although slightly different results may be obtained.

6.2 *Mixing Cycles*:

6.2.1 *Method A: Mill Mix*—See Table 2.

6.2.1.1 Mix with the mill roll temperature maintained at $40 \pm 5^\circ\text{C}$ ($104 \pm 9^\circ\text{F}$). The indicated mill openings should be maintained insofar as possible to provide a standard for uniform breakdown of the rubber due to milling. Necessary adjustments may be made to maintain a good working bank at the nip of the rolls.