



Standard Test Method for Rubber—Evaluation of Chloroprene Rubber (CR)¹

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1. Scope

1.1 This test method covers the standard materials, test formulas, mixing procedures and test methods for evaluation and quality control testing of chloroprene rubbers (CR). CR can be generally classified according to the two types of polymerization modifiers used in their manufacture: sulfur modified types and mercaptan modified types.

1.2 The values stated in SI-units are to be regarded as the standard. The values 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:

D 412 Test Methods for Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers—Tension²

D 1646 Test Method for Rubber—Viscosity and Vulcanization Characteristics (Mooney Viscometer)²

D 2084 Test Method for Rubber Property—Vulcanization Characteristics Using Oscillating Disc Cure Meter²

D 3182 Practice for Rubber—Materials, Equipment and Procedures for Mixing Standard Compounds and Preparing Standard Vulcanized Sheets²

D 3896 Practice for Rubber from Synthetic Sources—Sampling²

D 4483 Practice for Determining Precision for Test Method Standards in the Rubber and Carbon Black Industries²

D 5289 Test Method for Rubber Property – Vulcanization using Rotorless Cure Meters²

3. Summary of Test Method

3.1 Separate standard gum or carbon black filled formulations, or both, using different samples of CR, are prepared on a laboratory mill or in a Miniature Internal Mixer (MIM) in accordance with Practice D 3182.

3.2 See Test Method D 1646 for Mooney scorch times and Test Method D 2084 or D 5289 for cure meter data of the formulations.

3.3 Tensile sheets for stress/strain testing are vulcanized in accordance with Practice D 3182 and 100 and 300 % modulus, tensile strength and elongation at break are measured in accordance with Test Method D 412.

4. Significance and Use

4.1 This test method is intended for referee purposes, but may be used for quality control, research and development testing and comparison of different rubber samples in a standard formula.

4.2 This test method may also be used to obtain values for customer acceptance of rubber.

4.3 This test method is a revision of Test Methods D 3190 (prior to 1991), with 3-methyl thiazolidine thione-2 being substituted for ethylene thiourea (ETU), a suspected carcinogen.

5. Standard Test Formulae

5.1 The Standard Test Formulae are shown in Table 1. Formulae Nos. 1 and 2 shall be used for sulfur modified CR and Nos. 3 and 4 for mercaptan modified CR.

6. Sample Preparation

6.1 Obtain and prepare the test samples in accordance with Practice D 3896.

7. Mixing Procedure

7.1 The following three mixing procedures are offered:

7.1.1 *Mill Method A*—For Formulae Nos. 1 and 2.

7.1.2 *Mill Method B*—For Formulae Nos. 3 and 4.

7.1.3 *Miniature Internal Mixer Method*—For Formulae Nos. 1, 2, 3 and 4.

7.1.4 *Laboratory Banbury*—All Formulae

NOTE 1—It is not implied that comparable results will be obtained by these methods.

NOTE 2—The indicated mill openings are desired and should be maintained in so far as possible to provide a standard for breakdown of the rubber due to milling.

7.2 Raw Rubber Preparation:

7.2.1 With the mill roll temperature maintained at $50 \pm 5^\circ\text{C}$ ($122 \pm 9^\circ\text{F}$), set the mill opening at 1.5 mm (0.060 in.) and

¹ This test method is under the jurisdiction of ASTM Committee D11 on Rubber and is the direct responsibility of Subcommittee D11.23 on Synthetic Rubbers.

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² *Annual Book of ASTM Standards*, Vol. 09.01.