



# Standard Test Method for Rubber—Evaluation of Chloroprene Rubber (CR)<sup>1</sup>

This standard is issued under the fixed designation D3190; 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 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:<sup>2</sup>

**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

**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. 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 **D3182**.

3.2 See Test Method **D1646** for Mooney scorch times and Test Method **D2084** or **D5289** for cure meter data of the formulations.

3.3 Tensile sheets for stress/strain testing are vulcanized in accordance with Practice **D3182** and 100 and 300 % modulus, tensile strength and elongation at break are measured in accordance with Test Method **D412**.

## 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 D3190 (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 **D3896**.

## 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.

<sup>1</sup> 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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<sup>2</sup> For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org), or contact ASTM Customer Service at [service@astm.org](mailto:service@astm.org). For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.