



Standard Practice for Rubber—Materials, Equipment, and Procedures for Mixing Standard Compounds and Preparing Standard Vulcanized Sheets¹

This standard is issued under the fixed designation D 3182; 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 Department of Defense.

^{ε1} NOTE—Figures 1, 2, and 4 were corrected editorially in May 2004.

1. Scope

1.1 This practice provides a listing of reference compound-listed materials required to prepare the rubber test compounds listed in succeeding methods and contains procedures for weighing. It also specifies the mixing equipment, general mixing procedures, vulcanization equipment and procedures.

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 and health practices and determine the applicability of regulatory limitations prior to use. For specific precaution statements, see 5.5.*

2. Referenced Documents

2.1 ASTM Standards:

D 88 Test Method for Saybolt Viscosity²

D 1646 Test Method for Rubber—Viscosity, Stress Relaxation, and Pre-Vulcanization Characteristics (Mooney Viscometer)³

D 2084 Test Method for Rubber Property—Vulcanization Using Oscillating Disk Cure Meter³

D 2161 Practice for Conversion of Kinematic Viscosity to Saybolt Universal Viscosity or to Saybolt Furol Viscosity⁴

D 2226 Classification for Various Types of Petroleum Oils for Rubber Compounding Use³

D 2501 Test Method for Calculation of Viscosity-Gravity Constant (VGC) of Petroleum Oils⁴

D 4678 Practice for Rubber—Preparation, Testing, Acceptance, Documentation, and Use of Reference Materials³

E 145 Specification for Gravity-Convection and Forced-Ventilation Ovens⁵

3. Significance and Use

3.1 This practice shall be used for specific procedures used in preparing rubber compounds for quality control of production, for research and development purposes, and for comparison of different materials.

4. Standard Materials

4.1 Standard Reference Materials:

4.1.1 The materials required for standard rubber test formulas shall be National Institute of Standards and Technology (NIST) Reference Materials or materials that are known to have properties similar to these standard materials. However, in case of dispute, the following actual standard materials from the NIST of the United States shall be used:

4.1.2 An Industry Reference Material (IRM) is a standard reference from a designated supplier and has been certified in accordance with Practice D 4678.^{6,7}

NIST Standard Reference Material or IRM	Standard Reference Material No.	Industry Reference Material No.
Zinc oxide	370	
Sulfur	371	
Stearic acid	372	
Benzothiazyl disulfide ⁶		2
Tetramethylthiuram disulfide ^{6,7}		1
Magnesium oxide	376	
Oil furnace carbon black—HAF	378	

¹ This practice is under the jurisdiction of ASTM Committee D11 on Rubber and is the direct responsibility of Subcommittee D11.20 on Compounding Materials and Procedures.

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² *Annual Book of ASTM Standards*, Vol 04.04.

³ *Annual Book of ASTM Standards*, Vol 09.01.

⁴ *Annual Book of ASTM Standards*, Vol 05.01.

⁵ *Annual Book of ASTM Standards*, Vol 14.04.

⁶ NIST has discontinued supply of SRM 373, 374, and 385. A substitute material is available as IRM 2, 1, and 201 respectively from Forcoven Products, Inc., P.O. Box 1556, Humble, TX 77338 for IRM 1 and 2. IRM 201 is available from Akron Chemical Co., 255 Fountain St., Akron, OH 44304. Request RR: D11-1034, available from ASTM International Headquarters.

⁷ Supporting data are available from ASTM International Headquarters. Request RR: D11-1026.