



## Standard Classification for Rubber Compounding Materials—Recycled Vulcanizate Particulate Rubber<sup>1</sup>

This standard is issued under the fixed designation D 5603; 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 classification covers the compounding material commercially known as recycled vulcanizate particulate rubber. Recycled vulcanizate particulate rubber is the product that results when vulcanizate rubber has been processed by some means to obtain a desired particle size distribution.

1.2 *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 297 Test Methods for Rubber Products—Chemical Analysis<sup>2</sup>
- D 1418 Practice for Rubber and Rubber Latices—Nomenclature<sup>2</sup>
- D 1509 Test Methods for Carbon Black—Heating Loss<sup>2</sup>
- D 1566 Terminology Relating to Rubber<sup>2</sup>
- D 1900 Practice for Carbon Black—Sampling Bulk Shipments<sup>2</sup>
- D 4483 Practice for Determining Precision for Test Method Standards in the Rubber and Carbon Black Industries<sup>2</sup>
- D 5644 Test Method for Rubber Compounding Materials—Determination of Particle Size Distribution of Recycled Vulcanizate Particulate Rubber<sup>2</sup>
- E 11 Specification for Wire-Cloth Sieves for Testing Purposes<sup>3</sup>
- E 105 Practice for Probability Sampling of Materials<sup>3</sup>
- E 122 Practice for Choice of Sample Size to Estimate a Measure of Quality for a Lot or Process<sup>3</sup>

### 3. Terminology

#### 3.1 Definitions:

3.1.1 *recycled vulcanizate particulate rubber, n*—recyclable vulcanizate rubber that has been processed to give particulates or other forms of different shapes, sizes, and size distributions.

3.1.1.1 *Discussion*—The words “vulcanizate” and “vulcanized” are interchangeable. Additional terminology associated with this classification can be found in Terminology D 1566.

3.1.2 *parent compound, n*—original compound used in the product.

### 4. Significance and Use

4.1 Recycled vulcanizate particulate rubber is important in rubber compounding. It allows the rubber compounder to add a certain percentage of rubber filler back into its parent or similar compounds or to use the material as substitute or stand alone compound. Its use may lower compound costs or improve performance characteristics, or both.

4.2 Many types of recycled vulcanizate particulate rubber are available, with the number of types of vulcanizate particulate rubber limited only by the number of parent compounds.

4.3 Use of recycled rubber has a positive environmental impact.

### 5. Classification of Recycled Vulcanizate Particulate Rubber

5.1 Several grades of recycled vulcanizate particulate rubber exist. Their classification is based on two major characteristics: particle size distribution and the polymer type found in the parent rubber from which the recycled vulcanizate particulate rubber was derived.

5.2 *Particle Size Distribution*—maximum particle size. (For product mesh size designations, see 5.5.)

5.2.1 Coarse rubber powders are products with designations of 425 μm (40 mesh) or larger. These materials typically range in particle sizes from 2000 μm (10 mesh) to 425 μm (40 mesh) regardless of polymer type or method of processing.

5.2.2 Fine rubber powders are products with designations smaller (finer) than 425 μm (40 mesh). These materials typically range in particle sizes from less than 300 μm (50 mesh) to less than 75 μm (200 mesh) regardless of polymer type or method of processing.

#### 5.3 Classification by Parent Compounds:

5.3.1 Based on polymer/compound type alone, the three most common grades (Grades 1, 2, and 3) used in rubber compounding and three other grades are shown as follows:

5.3.1.1 *Grade 1*—Whole tire recycled vulcanizate particulate rubber is prepared from passenger car, truck, and bus tires from which the fiber and metal have been removed. The rubber is then processed to the desired particle size.

<sup>1</sup> This classification is under the jurisdiction of Committee D-11 on Rubber and is the direct responsibility of Subcommittee D11.26 on Rubber Recycling.

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<sup>2</sup> Annual Book of ASTM Standards, Vol 09.01.

<sup>3</sup> Annual Book of ASTM Standards, Vol 14.02.