



Designation: D5644 – 23

Standard Test Method for Rubber Compounding Materials—Determination of Particle Size Distribution of Recycled Vulcanizate Particulate Rubber¹

This standard is issued under the fixed designation D5644; 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 describes the procedures for determining average particle size distribution of recycled vulcanizate particulate rubber by the mechanical vibratory sieve shaker test method for 90 μm (170 mesh) or larger particles.

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

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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.4 *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

[D1566 Terminology Relating to Rubber](#)

[D5603 Classification for Rubber Compounding Materials—Recycled Vulcanizate Rubber](#)

[E11 Specification for Woven Wire Test Sieve Cloth and Test Sieves](#)

[E105 Guide for Probability Sampling of Materials](#)

3. Terminology

3.1 Definitions:

¹ This test method is under the jurisdiction of ASTM Committee D11 on Rubber and Rubber-like Materials and is the direct responsibility of Subcommittee D11.27 on Rubber Sustainability.

Current edition approved Nov. 1, 2023. Published November 2023. Originally approved in 1994. Last previous edition approved in 2018 as D5644 – 18. DOI: 10.1520/D5644-23.

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.

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

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

3.1.3 *Discussion*—The words “vulcanizate” and “vulcanized rubber” are interchangeable. Additional terminology associated with this classification can be found in Terminology [D1566](#).

4. Significance and Use

4.1 The particulate size distribution of vulcanizate particulate rubber is used for the purpose of assigning a product mesh or average particle size designation.

4.2 The product designation for mesh size for the Ro-tap method is based on the size designation screen which allows a range for the upper limit retained of maximum 5 % for up to 850 μm (20 mesh) particles, maximum 10 % for 850 to 150 μm (20 to 100 mesh), and maximum 15 % for 125 to 20 μm (120 to 635 mesh). No rubber particles shall be retained on the zero screen (see Table 2, Classification [D5603](#)).

4.3 The weight percent retained on a specific screen is noted.

5. Summary of Test Method

5.1 *Mechanical Vibratory Sieve Shaker Method*—A 100 ± 1 g specimen of the recycled rubber is combined with a fixed amount of flowing agent (for example, hydrous magnesium silicate (talc), fumed, aluminum oxide, fumed silica, or calcium carbonate) and placed on top of a series of mesh sieves, with the coarsest sieve being on top and the finest on the bottom. The specimen is placed in a mechanical vibratory sieve shaker for 10 to 20 min, depending on the classification by particle size identified in Classification [D5603](#) 5.4.1 of the recycled rubber. The weight of the rubber retained on the individual sieves is then recorded and the mesh designation of the product determined.