



Designation: E1037 – 21

Standard Test Method for Measuring Particle Size Distribution of RDF-5¹

This standard is issued under the fixed designation E1037; 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 is used to determine the size distribution of a RDF-5 sample. Size is defined as the maximum length of the particle, where length is determined by the RDF-5 manufacturing process. That is, a pellet, cubette, or briquette all have a recognizable length. Fig. 1 displays the sizes and shapes of some RDF-5 particles.

1.2 An air-dried RDF-5 sample is separated into categories of differing particle sizes. The size distribution is measured as the weight percentage of each size category. A graph of a function of the cumulative fraction of material by weight finer than particle size versus particle size is plotted. From this plot are taken values which describe the size distribution—the uniformity constant and the characteristic particle size.

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

D5681 Terminology for Waste and Waste Management

3. Terminology

3.1 For definitions of general terms used in this standard, refer to Terminology D5681.

¹ This test method is under the jurisdiction of ASTM Committee D34 on Waste Management and is the direct responsibility of Subcommittee D34.03 on Treatment, Recovery and Reuse.

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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.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *RDF-5*—solid fuel derived from municipal solid waste in which the processed combustible fraction is densified (compressed) into the form of pellets, cubettes, or briquettes.

4. Significance and Use

4.1 The particle size distribution of RDF-5 strongly influences the storage and handling characteristics of the fuel. Small particles tend to block flow through storage bins and feed hoppers, although correct bin and hopper designs will alleviate this blockage problem.

4.2 This test method for measuring size manually allows for accurate description of RDF-5 particle size distribution. Manual measurement is superior to sieving techniques, wherein particles may be broken by the size separation technique itself. However, hand measurement is more time consuming than sieving techniques.

5. Apparatus

5.1 *Labelled Containers*, used to hold the particles which are separated by size. Appropriate containers are beakers or pans labelled “ ≥ 70 mm,” “ ≥ 60 mm to < 70 mm,” etc. The tare weight of each container shall be recorded to 0.1 g.

5.2 *Scale*, capable of weighing the sample and container with an accuracy of 0.1 g.

5.3 *Vernier Calipers*, a length-measuring instrument having an accuracy of 0.1 mm.

6. Procedure

6.1 The sample shall weigh 1.0 ± 0.1 kg (2.2 ± 0.2 lb) unless otherwise specified. Record the weight of the sample to the nearest 0.1 g.

6.2 Beginning with the largest particles, measure the length of each particle in the sample. Separate the particles into containers labelled as the size categories of less than 10 mm, 10 to less than 20 mm, 20 to less than 30 mm, 30 to less than 40 mm, etc. as needed.

6.3 Record the weight of each size category to 0.1 g.

6.4 Add the weights of the size components. If this sum differs by more than 2 % from the sample weight recorded initially, then reject the analysis and begin another test.