



Designation: D1937 – 23

Standard Test Method for Carbon Black, Pelleted—Mass Strength¹

This standard is issued under the fixed designation D1937; 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 reappraisal. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reappraisal.

1. Scope

1.1 This test method covers the determination of the mass strength of pelleted carbon black. It is designed to determine the force required to pack a cylindrical column of pelleted carbon black. The results of this test are believed to relate to the ability of the carbon black to flow in bulk handling systems.

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, 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

[D1799 Practice for Carbon Black—Sampling Packaged Shipments](#)

[D1900 Practice for Carbon Black—Sampling Bulk Shipments](#)

[D4483 Practice for Evaluating Precision for Test Method Standards in the Rubber and Carbon Black Manufacturing Industries](#)

3. Summary of Test Method

3.1 A sample of carbon black is placed in a vertical cylinder and pressed with a plunger for 10 s after which the bottom of

the cylinder is opened, whereupon all of the carbon black either falls out the bottom or forms a ring or bridge in the cylinder. The process is repeated with a new sample until the minimum force required for the carbon black to form a ring or bridge is found. The resultant force is called mass strength and is reported in Newtons.

4. Significance and Use

4.1 Mass strength gives an indication of the flowability in bulk handling. It is affected by pellet properties such as hardness, size, shape, and especially fines content. Due to the influence of other variables, the user and the producer must determine an acceptable mass strength level.

5. Apparatus

5.1 *Mass Strength Tester*,³ with a compression chamber comprising:

5.1.1 *Hollow Compression Cylinder*, of 95.25 mm (3.75 in.) depth and 52.4 mm (2.06 in.) diameter, made of stainless steel.

5.1.2 *Plunger*, of 50.8 mm (2 in.) diameter and a central bore of 12.7 mm (0.5 in.) diameter and 19 mm (0.75 in.) depth, made of stainless steel.

5.1.3 *Force Application Mechanism*, allowing the application of a controllable force onto the plunger.

5.2 *Powder Funnel*, to completely fill the cylinder.

5.3 *Spatula*, with a straight edge of at least 55 mm (2.2 in.).

5.4 *Brush*, approximately 40 mm (1.5 in.), stiff bristle.

6. Sampling

6.1 Samples shall be taken in accordance with Practices [D1799](#) or [D1900](#).

7. Calibration

7.1 The manufacturer will typically calibrate the instrument's measurement system before delivery. Load cells are typically calibrated or verified using a reference load cell or calibrated masses, or both. Traceability is recommended for all calibration devices. Follow the manufacturer's recommendations for calibration frequency and procedure.

¹ This test method is under the jurisdiction of ASTM Committee D24 on Carbon Black and is the direct responsibility of Subcommittee D24.51 on Carbon Black Pellet Properties.

Current edition approved May 1, 2023. Published May 2023. Originally approved in 1962. Last previous edition approved in 2021 as D1937 – 21. DOI: 10.1520/D1937-23.

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 For information about known sources of supply of mass strength tester instruments, please contact ASTM International at service@astm.org.