



Designation: D8466 – 22

Standard Guide for Recovered Carbon Black—Carbon Black Test Methods for Testing rCB¹

This standard is issued under the fixed designation D8466; 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 guide includes a list of standards under jurisdiction of ASTM Committee D24 on Carbon Black; however, they can be applied for use in the rCB industry.

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

1.3 *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

- D1506 Test Methods for Carbon Black—Ash Content
- D1508 Test Method for Carbon Black, Pelleted Fines and Attrition
- D1509 Test Methods for Carbon Black—Heating Loss
- D1511 Test Method for Carbon Black—Pellet Size Distribution
- D1512 Test Methods for Carbon Black—pH Value
- D1513 Test Method for Carbon Black, Pelleted—Pour Density
- D1514 Test Method for Carbon Black—Sieve Residue
- D1618 Test Method for Carbon Black Extractables—Transmittance of Toluene Extract
- D1619 Test Methods for Carbon Black—Sulfur Content
- D1799 Practice for Carbon Black—Sampling Packaged Shipments

¹ This guide is under the jurisdiction of ASTM Committee D36 on Recovered Carbon Black (rCB) and is the direct responsibility of Subcommittee D36.10 on Recovered Carbon Black.

Current edition approved June 1, 2022. Published June 2022. DOI: 10.1520/D8466-22.

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.

- D1900 Practice for Carbon Black—Sampling Bulk Shipments
- D1937 Test Method for Carbon Black, Pelleted—Mass Strength
- D2663 Test Methods for Carbon Black—Dispersion in Rubber
- D3053 Terminology Relating to Carbon Black
- D3191 Test Methods for Carbon Black in SBR (Styrene-Butadiene Rubber)—Recipe and Evaluation Procedures
- D3192 Test Methods for Carbon Black Evaluation in NR (Natural Rubber)
- D3849 Test Method for Carbon Black—Morphological Characterization of Carbon Black Using Electron Microscopy
- D4122 Practice for Carbon Black—Evaluation of an Industry Reference Black
- D4821 Guide for Carbon Black—Validation of Test Method Precision and Bias
- D5230 Test Method for Carbon Black—Automated Individual Pellet Hardness
- D5817 Practice for Carbon Black, Pelleted—Reduction, Blending, and Drying of Gross Samples for Testing
- D6915 Practice for Carbon Black—Evaluation of Standard Reference Blacks
- D7771 Test Method for Determination of Benzo- α -Pyrene (BaP) Content in Carbon Black

3. Significance and Use

3.1 Committee D36 has concluded that typical carbon black characterization methods based on structure level and surface area measurements do not seem to correlate to in-rubber performance in an equal manner for Recovered Carbon Black products. Therefore, the committee does not recommend such test methods for predicting the applications performance of recovered carbon black products. The committee is open to new research that can contradict above statement.

3.2 Committee D36 approved to recognize the standards in 2.1 as acceptable for use in the rCB industry until rCB statistical data is available that may suggest otherwise.

4. Carbon Black Standards for Use in rCB Testing

4.1 *Properties*—Ash Content according to Test Methods D1506, Pellet Fines and Attrition according to Test Method

D1508, Heating Loss according to Test Methods **D1509**, Pellet Size Distribution according to Test Method **D1511**, pH Value according to Test Methods **D1512**, Pour Density according to Test Method **D1513**, Sieve Residue according to Test Method **D1514**, Transmittance of Toluene Extract according to Test Method **D1618**, Sulfur Content according to Test Methods **D1619**, Pellet Mass Strength according to Test Method **D1937**, Dispersion in Rubber according to Test Methods **D2663**, Morphological Characterization by Electron Microscopy according to Test Method **D3849**, Automated Individual Pellet Hardness according to Test Method **D5230**, Benzo- α -Pyrene (BaP) Content according to Test Method **D7771**.

NOTE 1—Caution must be exercised when applying Test Method **D3849** to recovered carbon blacks as these products are derived mainly from tires and will contain two or more grades of carbon black. Using primary particle size measurements on rCB to establish equivalence to N series, and hence predict reinforcement properties will likely be erroneous due to the mixture of virgin carbon blacks in the feedstock (tires) used in the recovery process. Also, the smallest dispersible unit of rCB is an agglomerate of carbon blacks, silica, and other substances bound together and therefore this method is not suited to determine the primary particle

size or aggregate size, or both, of the carbon black component of rCB.

4.2 *Sampling and Preparation*—Sampling Packaged Shipments according to Practice **D1799**, Sampling Bulk Shipments according Practice **D1900**.

4.3 *Reference Materials and Statistics*—Evaluation of an Industry Reference Black according to Practice **D4122**, Validation of Test Method Precision and Bias according to Guide **D4821**, Reduction, Blending, and Drying of Gross Samples for Testing according to Practice **D5817**, Evaluation of Standard Reference Blacks according to Practice **D6915**.

4.4 *Reference Compounds*—Carbon Black in SBR according to Test Methods **D3191**, Carbon Black in NR according to Test Methods **D3192**.

4.5 *Terminology*—Terminology Relating to Carbon Black according to Terminology **D3053**.

5. Keywords

5.1 recovered carbon black; testing

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