



## Test Method for Carbon Black, Pelleted Fines and Attrition<sup>1</sup>

This standard is issued under the fixed designation D 1508; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

### 1. Scope

1.1 This test method covers the determination of the fines and attrition of pelleted carbon black.

### 2. Referenced Documents

#### 2.1 ASTM Standards:

- D 1511 Test Method for Carbon Black—Pellet Size Distribution<sup>2</sup>
- D 1799 Practice for Carbon Black—Sampling Packaged Shipments<sup>2</sup>
- D 1900 Practice for Carbon Black—Sampling Bulk Shipments<sup>2</sup>
- D 5817 Practice for Carbon Black, Pelleted-Reduction and Blending of Gross Samples<sup>2</sup>
- E 11 Specification for Wire-Cloth Sieves for Testing Purposes<sup>3</sup>

### 3. Summary of Test Method

3.1 Method A Fines - A sample of carbon black is placed on a 125- $\mu\text{m}$  sieve and shaken in a mechanical sieve shaker for 5 minutes. The pellets, pellet fragments, dust and unpelletized black that pass through the sieve are defined as carbon black fines. The fines are expressed in percent.

3.2 Method B Attrition - The same test sample is shaken for an additional 15 minutes to determine the amount of pellet degradation or attrition created during this additional shake interval. The attrition is expressed in percent.

### 4. Significance and Use

4.1 Method A - Fines - The fines content of carbon black is related to the bulk flowability, dustiness, and, in some instances, the level of dispersion. Due to the many other variables that influence dispersion and handling, the significance of fines content must be determined by the user.

4.2 Method B - Attrition - By comparing the percent fines and attrition, an indication can be obtained of pellet stability and the amount of fines that may be created by pellet degradation in conveying, handling or transit.

<sup>1</sup> This practice is under the jurisdiction of ASTM Committee D-24 on Carbon Black and is the direct responsibility of Subcommittee D24.51 on Carbon Black Pellet Properties.

Current edition approved July 10, 1999. Published September 1999. Originally published as D 1508-57 T. Last previous edition D 1508-98.

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

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

### 5. Apparatus

- 5.1 *Mechanical Sieve Shaker*.<sup>4</sup>
- 5.2 *Sieves*, six 125- $\mu\text{m}$  (U.S. Standard No. 120) having a 200-mm (8-in.) diameter and 25-mm (1-in.) height, or equivalent, conforming to Specification E 11.
- 5.3 *Sieve Separator Receivers*, five required.
- 5.4 *Sieve Cover*.
- 5.5 *Bottom Receiver Pan*.
- 5.6 *Riffle Sample Splitter*.
- 5.7 *Small Scoop or Large Spoon*.
- 5.8 *Balance*, 0.1-g sensitivity.

### 6. Sampling

- 6.1 Samples shall be taken in accordance with Practice D 1799 or Test Method D 1900.
- 6.2 Practice D 5817 shall be used for reduction and blending of samples.

### 7. Procedure

- 7.1 Method A - Fines and Method B - Attrition
  - 7.1.1 Stack up to six sets of sieves and receivers with a receiver beneath each sieve.
  - 7.1.2 Weigh 25.0 g portions, being careful to dip approximately 25 g of black from the riffle splitter.

NOTE 1—It is not good practice to weigh the sample by pouring it directly out of the black container since the fines and smaller pellets will tend to remain in the container while the larger pellets pour out first. Dipping the black from the container is the preferred technique.

- 7.1.3 Transfer each sample to an individual 125- $\mu\text{m}$  sieve.

NOTE 2—Six different materials or samples may be tested when all six sets of sieves are used. In some labs the position of the sieve may affect results with the higher sieves yielding higher fines data. For this reason the center position, sieves 3 and 4, should be used for referee testing.

- 7.1.4 Assemble up to six sets of sieves and receivers into a stack. Place a cover on top and transfer to the shaker. Tighten the shaker to eliminate any looseness.

- 7.1.5 Start the shaker and allow to shake for 5 min with the hammer operating.

- 7.1.6 Remove the sieve assembly from the shaker and weigh the carbon black retained in each receiver to the nearest 0.1 g.

NOTE 3—To test only attrition, discard the fines without weighing.

<sup>4</sup> A Ro-Tap sieve shaker is satisfactory for this purpose. For a description of this apparatus refer to Test Method D 1511.