Designation: D1799 – 20

Standard Practice for Carbon Black—Sampling Packaged Shipments[1]

This standard is issued under the fixed designation D1799; 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.

This standard has been approved for use by agencies of the U.S. Department of Defense.

1. Scope

1.1 This practice covers the sampling of packaged carbon blacks for shipment in bags, cartons, flexible intermediate bulk containers (FIBC), or other non-bulk packages.

NOTE 1—The tests to be made on the samples obtained by this practice shall be determined by the producer and the consumer. The specific details of each test method are described in appropriate ASTM methods used for testing carbon black.

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

D1509 Test Methods for Carbon Black—Heating Loss

D5817 Practice for Carbon Black, Pelleted—Reduction, Blending, and Drying of Gross Samples for Testing

3. Significance and Use

3.1 This practice is for use in obtaining representative samples of carbon black from the packages in the shipment. These samples are used to determine the average quality or variability of the shipment.

4. Apparatus

4.1 *Sample Splitter,* riffle-type (see Practice D5817 for equipment information).

4.2 *Sample Containers,* airtight, 4 dm^3 (1-gal) capacity.

4.3 *Scoop,* sample.

4.4 *Thief,* sample.

5. General

5.1 Packaged shipments of carbon blacks most often consist of 11.35-kg (25-lb), 22.7-kg (50-lb), 25-kg (55-lb), or 50-kg (110-lb) bags. Flexible intermediate bulk containers usually range in size from 180 kg (396 lb) to 1300 kg (2860 lb). This practice may be applied to bags or FIBCs of other sizes. These packages are loaded into vans in definite patterns agreed upon by the producer and the consumer. These may be in the form of unit loads, stacks, or individual FIBCs. In each case, a shipment involves a given number of packages, units, tiers, or mass.

5.2 Samples are taken to evaluate conformance to specified requirements. Multiple samples may be taken to evaluate conformance or uniformity, or both, of a lot. The number of samples, their location within the lot, and the quantity of the samples is determined by the purpose for taking the samples. A lot shall be sampled as prescribed at the point of manufacture or at the receiving point as agreed upon by the producer and the consumer. Samples may be taken from the packages as loaded or as received. Each sample taken shall represent a unit, lot, or approximately equal mass of material. Generally, it is desirable to take one sample to represent each 5000 kg (11 000 lb) increment of the lot. For smaller lot sizes being sampled for uniformity, three samples representing approximately equal masses are recommended. If the uniformity of the lot is suspect or unknown, more samples may be required. For lots with known acceptable uniformity, one sample may be sufficient.

5.3 The size of the individual sample taken shall be determined by the purpose for taking the sample; the quantity needed to perform the expected test(s) with enough to repeat a test, if needed; whether the sample will be tested individually or in a composite; and the quantity needed for blending. For all samples except those taken directly from a bag, a minimum of 4 dm^3 (1 gal) is recommended. The 4 dm^3 (1 gal) minimum

[1] This practice is under the jurisdiction of ASTM Committee D24 on Carbon Black and is the direct responsibility of Subcommittee D24.61 on Carbon Black Sampling and Statistical Analysis.

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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.

sample size is recommended because pelleted carbon blacks tend to stratify. When sampling directly from an individual bag, the mass removed must be small enough that it does not adversely affect the final mass remaining in the bag to render it unsuitable for use.

NOTE 2—Pellet quality tests may be erroneous due to a local or spotty condition unless the samples are blended through the sample splitter as described in Practice D5817.

6. Sample Preparation and Handling

6.1 Store the samples in airtight containers until the tests are completed. This is especially critical if the samples are to be tested for Heating Loss (see Test Methods D1509).

NOTE 3—If the samples are to be tested for *heating loss* and the sampling activity takes place outside an area sheltered from the environment, it is critical that steps be taken to prevent the samples from being exposed to sources of water, such as rain, snow, ice, and water sources related to ocean freight.

6.2 Handle samples collected for the determination of pellet quality with discretion to avoid pellet breakdown.

6.3 If individual samples are taken for testing independently, prepare the samples in accordance with Practice D5817. This is particularly important if pellet quality tests are to be made on the sample. It is highly recommended that the mean quality of the shipment be calculated from the individual samples. This will provide mean quality, and maximum and minimum variations.

6.4 If individual samples are composited, prepare the sample(s) for testing in accordance with Practice D5817.

7. Procedure

7.1 In the absence of an agreed upon sampling pattern between the producer and the consumer, the following sampling pattern per shipment is recommended with the assumption that the lot was produced and packaged under conditions to insure acceptable lot uniformity. If the uniformity of the lot is suspect or unknown, the number of samples taken should be increased.

7.1.1 *Bags:*

7.1.1.1 One or more bags but less than a full unit: one sample from one bag.

7.1.1.2 One to four units: one sample from one unit.

7.1.1.3 Five to eight units: at least three samples representing the first, middle, and last units.

7.1.1.4 More than eight units: sample the first, sixth, twelfth, eighteenth, and if available, twenty-fourth units.

7.1.2 *FIBCs:*

7.1.2.1 One to four FIBCs: one sample from one FIBC.

7.1.2.2 Five to eight FIBCs: at least three samples representing the first, middle, and last FIBCs.

7.1.2.3 More than eight FIBCs:

(1) FIBCs weighing 500 kg (1100 lb) or less, sample the first, tenth, twentieth, thirtieth, and if available, fortieth FIBC.

(2) FIBCs weighing more than 500 kg (1100 lb), sample the first, sixth, twelfth, eighteenth, and if available, twenty-fourth FIBC.

7.2 *Bag Sampling:*

7.2.1 *Method A*—Using a scoop, remove the sample for testing from a representative portion of the bag after carefully removing at least a 25–mm (1–in.) thickness of surface material, or more if needed, to reach the mass of interest from the position sampled (see 5.3).

7.2.2 *Method B*—The sample mass may be collected from the flowing stream (“as loaded”) while the bag is being filled.

7.2.3 *Method C*—Use a scoop sized to fit the bag loading sprout to remove the sample mass (see 5.3).

7.3 *FIBC Sampling:*

7.3.1 *Method A*—Use a scoop to remove a 4 dm^3 (1 gal) sample. The sample should not be taken from material directly under the loading spout due to the possible presence of disproportionately high fines created by the loading equipment. Using the scoop, move aside about 100 mm (4 in.) of the top material at the selected sample site before removing the sample material.

7.3.2 *Method B*—A sample thief may be used to sample material from the FIBC. The thief must be able to sample at least 150 mm (6 in.) below the surface. It may be necessary to use the thief several times to collect the 4 dm^3 (1 gal) sample.

7.3.3 *Method C*—The sample mass may be collected from the flowing stream (“as loaded”) while the FIBC is being filled.

7.4 Test the sample(s) thus obtained from the package(s) of carbon black singly or composited, as agreed upon by the producer and consumer. In the absence of an agreed upon testing plan between the producer and the consumer, test each sample individually, except for those tests where the carbon black is mixed with rubber for testing. For those tests, a composite sample is acceptable.

8. Report

8.1 In the absence of an agreed upon reporting format between the producer and the consumer, the report of tests made on the material shall be the average of all samples tested for each test.

8.2 The report of the tests shall include details as required in the appropriate ASTM methods used for testing carbon black.

9. Precision and Bias

9.1 Precision and bias are not applicable to this practice, since it does not produce quantitative data.

10. Keywords

10.1 bags; carbon black; cartons; flexible intermediate bulk container (FIBC); sampling of packaged shipments