



# Standard Test Method for the Sieve Analysis of Coke<sup>1</sup>

This standard is issued under the fixed designation D293; 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 describes the separation of a coke sample into defined size fractions and expressing said fractions as a weight percent of the gross sample.

1.2 The values stated in SI units are to be regarded as the standard. Inch-pound units shall be accepted on an equivalent basis.

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

## 2. Referenced Documents

2.1 *ASTM Standards:*<sup>2</sup>

D346 Practice for Collection and Preparation of Coke Samples for Laboratory Analysis

D4621 Guide for Quality Management in an Organization That Samples or Tests Coal and Coke (Withdrawn 2010)<sup>3</sup>

E11 Specification for Woven Wire Test Sieve Cloth and Test Sieves

E323 Specification for Perforated-Plate Sieves for Testing Purposes

## 3. Significance and Use

3.1 This test method determines the size distribution of coke for conformance to specifications of percentages retained on designated screen sizes.

## 4. Apparatus

4.1 *Sieves*—Use square-hole sieves conforming to Specification E11. Where sieves larger than 100 mm (4 in.) are

required, the specifications for same shall be by mutual agreement between interested parties. Permissible variations in sieve openings and spacings shall be in accordance with Specification E11.

4.1.1 For complete characterization of the size range of a coke sample, the number and size of the selected sieves should be such that no more than 25 % of the gross sample weight will be retained on any given sieve.

4.1.2 For coke 38.1 mm (1½ in.) and larger in size, sieves of heavy double-crimped wire and square or rectangular frames with 0.56 to 0.84 m<sup>2</sup> (6 to 9 ft<sup>2</sup>) of sieve area are satisfactory. For coke smaller than 38.1 mm (1½ in.) in size, sieves of double-crimped wire and square or circular frames with 0.19 to 0.37 m<sup>2</sup> (2 to 4 ft<sup>2</sup>) of sieve area are usually more convenient.

4.2 *Weighing Balance*, preferably of the platform type, having a sensitivity of 0.025 kg (0.05 lbs) or better, at rated capacity and with graduations such that 0.05 kg (0.1 lb) can be read without interpolation.

## 5. Test Sample

5.1 The test sample shall be taken in accordance with Practice D346.

## 6. Procedure

6.1 Starting with the sieve having the largest opening, sieve the sample of coke in quantities small enough to prevent plugging and clogging of the sieve.

6.1.1 Hand-fit each piece of coke retained on the 38.1-mm (1½-in.) or larger sieve. A piece is considered undersize, if in some position and without forcing, it passes the sieve opening.

6.1.2 Shake vigorously on each succeeding sieve coke pieces passing the 38.1-mm (1½-in.) sieve. This shaking may be performed manually or mechanically provided mechanical shaking yields results equivalent to manual shaking. Note that the objectives of shaking, either manual or mechanical, are to place all of the naturally occurring pieces of a given size range on the appropriate sieve and to avoid degradation of the naturally occurring sizes.

6.2 Record to the nearest 0.05 kg (0.1 lb) the weight of coke retained on each sieve and that which passes the smallest sieve used. For routine testing, the sum of all the size-fraction weights may be taken as the total weight of coke tested.

<sup>1</sup> This test method is under the jurisdiction of ASTM Committee D05 on Coal and Coke and is the direct responsibility of Subcommittee D05.15 on Metallurgical Properties of Coal and Coke.

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<sup>2</sup> 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.

<sup>3</sup> The last approved version of this historical standard is referenced on www.astm.org.

6.2.1 Samples containing pieces retained on 50-mm (2-in.) sieves and larger, need not be dried. However, when a higher degree of accuracy is desired, dry the gross sample to less than 1 % moisture and accurately weigh before sieving. Dry all samples of coke containing only pieces which pass a 50-mm sieve to less than 1 % moisture before testing.

## 7. Report

7.1 Report the weights of the size fractions as a percentage of the weight of the gross sample. Calculate percentage to the nearest 0.1 %. Record the results starting with the fraction of largest sieve size, which may be shown for separate fractions or cumulatively.

7.2 For those tests in which the gross sample is weighed before sieving, the sum of the weights of all size fractions should equal the measured gross weight. In cases in which the cumulative weight of size fractions differs from the initial gross weight by 0.5 % or less of the gross weight, adjustment can be

made in the weight of the size fraction passing the smallest sieve size. With careful procedure, this difference should not exceed 0.5 %.

## 8. Precision and Bias

8.1 *Reproducibility*—No precision statement has been developed for this test method because of the impracticality of obtaining, transporting, and handling representative splits of the materials in the quantities that would be needed to establish the precision statement.

8.2 *Repeatability*—The precision of this test method is being investigated by a task group. At this time the values have not been determined.

8.3 *Bias*—The lack of a reference material precludes a bias statement.

## 9. Keywords

9.1 breakage; coke; degradation; increments

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