



Designation: D4292 – 23

Standard Test Method for Determination of Vibrated Bulk Density of Calcined Petroleum Coke¹

This standard is issued under the fixed designation D4292; 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 test method covers the determination of bulk density of a representative 2 kg sample of calcined petroleum coke, after vibration to increase compaction.

1.2 The procedure is limited to particles passing through a 6.68 mm opening sieve (equivalent to a 0.265 in. USA Series) and retained on a 0.21 mm opening sieve (equivalent to a 70 mesh USA Series). Further, the procedure is limited to a specific test sample having particles retained between screens having openings that differ by a factor of less than $2\sqrt{2}$ and preferably less than 2.

1.3 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.4 *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.*

1.5 *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

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

D2013 Practice for Preparing Coal Samples for Analysis

D2234/D2234M Practice for Collection of a Gross Sample of Coal

D4057 Practice for Manual Sampling of Petroleum and Petroleum Products

D4175 Terminology Relating to Petroleum Products, Liquid Fuels, and Lubricants

D5709 Test Method for Sieve Analysis of Petroleum Coke

D6969 Practice for Preparation of Calcined Petroleum Coke Samples for Analysis

D6970 Practice for Collection of Calcined Petroleum Coke Samples for Analysis

E11 Specification for Woven Wire Test Sieve Cloth and Test Sieves

3. Terminology

3.1 *Definitions:*

3.1.1 For definitions of terms used in this test method, refer to Terminology D4175.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *as-calcined particles, n—of coke*, those particles that have not been subject to laboratory crushing.

3.2.2 *bulk density, n—of coke*, the ratio of the mass of a collection of particles of a specified particle size range to the volume occupied.

3.2.3 *gross sample, n*—the original, uncrushed, representative portion taken from a shipment or lot of coke.

3.2.4 *laboratory crushed particles, n—of coke*, those particles of petroleum coke that have been crushed in the laboratory.

4. Summary of Test Method

4.1 After appropriate crushing of the calcined coke, using both the jaw crusher and roll crusher, the test volume of 100 g is measured after vibration and the bulk density is calculated.

5. Significance and Use

5.1 Vibrated bulk density, VBD, is an indicator of calcined petroleum coke porosity, which affects its suitability for use in pitch-bonded carbon applications. (**Warning**—Vibrated bulk density for a sample of calcined petroleum coke is strongly dependent upon average particle size and particle size range. Bulk density tends to increase with decreasing coke size. A

¹ This test method is under the jurisdiction of ASTM Committee D02 on Petroleum Products, Liquid Fuels, and Lubricants and is the direct responsibility of Subcommittee D02.05 on Properties of Fuels, Petroleum Coke and Carbon Material.

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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.

*A Summary of Changes section appears at the end of this standard