



Designation: D5003 – 06a (Reapproved 2017)

Standard Test Method for Hardgrove Grindability Index (HGI) of Petroleum Coke¹

This standard is issued under the fixed designation D5003; 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.

INTRODUCTION

Introduction of petroleum coke into the coal market in recent years has necessitated the use of many of the test methods for coal so like data would be available for comparison and blending purposes. Test Method D409 does not cover petroleum coke in its scope and its statements of precision and bias do not include petroleum coke. This test method provides the procedures and precision and bias data for the hardgrove grindability index (HGI) of petroleum coke. Use of this test method or Test Method D409 produces the same value for the sample of petroleum coke being analyzed.

1. Scope

1.1 This test method covers the determination of the hardgrove grindability index (HGI) of those petroleum cokes that contain no dedusting additive. The procedure for this test method is the same as in Test Method D409. Sections of this test method contain the significance and use of the HGI of petroleum coke, preliminary sample preparation procedures, and procedure and precision and bias data specific to petroleum coke.

NOTE 1—The size consistency (particle size distribution) of fluid petroleum coke is generally 100 % passing a 6.73 mm (No. 3) sieve and greater than 80 % passing a 2.00 mm (No. 10) sieve. Much of fluid cokes will pass a 0.59 mm (No. 30) sieve. Because of this fineness the HGI value is related to the coarser particles in fluid coke and large samples are required to prepare sufficient material of the correct particle size for Test Method D409.

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

1.2.1 *Exception*—Hardgrove grindability index is unitless.

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

D409 Test Method for Grindability of Coal by the Hardgrove-Machine Method

D4930 Test Method for Dust Control Material on Calcined Petroleum Coke

3. Terminology

3.1 *Definitions:*

3.1.1 *calcined petroleum coke, n*—petroleum coke that has been thermally treated to drive off the volatile matter and to develop crystalline structure.

3.1.2 *fluid coke, n*—petroleum coke with a granular, microscopic layered structure resulting from injection of petroleum feedstock into a flowing, loose bed of coke particles.

3.1.3 *Hardgrove Grindability Index, HGI, unitless, n—in petroleum coke technology*, measurement of the relative ease of pulverizing a raw petroleum coke or green petroleum coke in comparison with coal standards. The higher the HGI value, the easier the petroleum coke is to grind.

3.1.4 *petroleum coke, n*—solid, carbonaceous residue produced by thermal decomposition of heavy petroleum fractions or cracked stocks, or both.

3.1.5 *raw petroleum coke, n*—petroleum coke that has not been calcined.

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.

Current edition approved Oct. 1, 2017. Published November 2017. Originally approved in 1989. Last previous edition approved in 2011 as D5003 – 06a (2011). DOI: 10.1520/D5003-06AR17.

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.