



Designation: D2416 – 84(Reapproved 2009)

Standard Test Method for Coking Value of Tar and Pitch (Modified Conradson)¹

This standard is issued under the fixed designation D2416; 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 the coking value of tar and pitch having an ash content not over 0.5 % as determined by Test Method D2415.

1.2 Coking values by this test method are practically the same as those obtained by Test Method D189, but results are more reproducible. The apparatus used is identical, except that an electric furnace is substituted for the gas flame.

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:*²

D140 Practice for Sampling Bituminous Materials

D189 Test Method for Conradson Carbon Residue of Petroleum Products

D370 Practice for Dehydration of Oil-Type Preservatives

D2415 Test Method for Ash in Coal Tar and Pitch

E11 Specification for Woven Wire Test Sieve Cloth and Test Sieves

3. Summary of Test Method

3.1 A sample of the tar or pitch is vaporized and pyrolyzed for a specified time at a specified temperature in special standardized equipment that limits the available oxygen supply. The percentage of residue is reported as the coking value.

4. Significance and Use

4.1 This test method is useful for indicating the relative coke-forming propensities and for evaluating and characteriz-

ing tars and pitches. This test method can also be used as one element in establishing the uniformity of shipments or sources of supply.

5. Apparatus (see Fig. 1)

5.1 *Crucible*—Wide-form, *a*, either porcelain, glazed throughout, or silica, *a*; 29 to 31-mL capacity, 46 to 49 mm in rim diameter.

5.2 *Skidmore Crucible*—Iron crucible, *b*, flanged and ringed, 65 to 82-mL capacity, 53 to 57 mm inside and 60 to 67 mm outside diameter of flange, 37 to 39 mm in height, supplied with a cover without delivery tubes and having the vertical opening closed. The horizontal opening of about 6.5 mm shall be kept clean. The outside diameter of the flat bottom shall be 30 to 32 mm.

5.3 *Metal Crucible*—Spun sheet-iron or nickel crucible, *c*, with cover; 78 to 82 mm in outside diameter at the top, 58 to 60 mm in height, and approximately 0.8 mm in thickness. At the bottom of this crucible, and level before each test, shall be a layer of about 25 mL of sand, or enough to bring the Skidmore crucible, with cover on, nearly to the top of the sheet-iron crucible. The sand shall be dry and screened to pass through a 65-mesh screen and to be retained on a 200-mesh screen.

5.4 *Wire Support*—Triangle (65 mm) of bare Nichrome wire 1.5 to 2.0 mm in cross section, having an opening small enough to support the bottom of the metal crucible (see 5.3). The triangle, *d*, shall have its arms bent to form a cradle that will support the metal crucible with its bottom level with the bottom of the insulator (see 5.6).

5.5 *Hood*—Circular, sheet-iron, *e*, from 120 to 130 mm in diameter, the height of the lower perpendicular side to be from 50 to 53 mm; provided at the top with a chimney 50 to 60 mm in height and 50 to 56 mm in inside diameter, which is attached to the lower part having the perpendicular sides by a cone-shaped member, bringing the total height of the complete hood to 125 to 130 mm. The hood may be made from a single piece of metal, providing it conforms to foregoing dimensions. A bridge, *g*, made of approximately 3 mm iron or nichrome wire, and having a height of 50 mm above the top of the chimney, shall be attached to handle the chimney when positioning.

5.6 *Insulator*—Ceramic block or refractory ring, *f*, 150 to 175 mm in diameter if round, or on a side if square, 32 to 38

¹ This test method is under the jurisdiction of ASTM Committee D02 on Petroleum Products 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, 2009. Published November 2009. Originally approved in 1965. Last previous edition approved in 2004 as D2416-84(2004). DOI: 10.1520/D2416-84R09.

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.