



Designation: D3997/D3997M – 24

Standard Practice for Preparing Coke Samples for Microscopical Analysis by Reflected Light¹

This standard is issued under the fixed designation D3997/D3997M; 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 practice covers laboratory procedures for the preparation of granular and lump coke into block and briquet samples for examination with a reflected light microscope. The samples prepared are used for examination and identification of the components in coke microtexture, the measurement of the reflectance of coke, and the analysis of coke microstructure.

NOTE 1—Sieve size is identified by its standard designation in Specification E11. The alternative designation given in parentheses is for information only and does not represent a different standard sieve size.

1.2 *Units*—The values stated in either SI units or inch-pound units, or other non-SI units, are to be regarded separately as standard. The values stated in each system are not necessarily exact equivalents; therefore, to ensure conformance with the standard, each system shall be used independently of the other and values from the two systems shall not be combined.

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

D121 Terminology of Coal and Coke

D346 Practice for Collection and Preparation of Coke

¹ This practice is under the jurisdiction of ASTM Committee D05 on Coal and Coke and is the direct responsibility of Subcommittee D05.28 on Petrographic Analysis of Coal and Coke.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at www.astm.org/contact. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

Samples for Laboratory Analysis

D5061 Test Method for Microscopical Determination of the Textural Components of Metallurgical Coke

E11 Specification for Woven Wire Test Sieve Cloth and Test Sieves

3. Terminology

3.1 Definitions:

3.1.1 For additional definitions of terms used in this practice, refer to Terminology D121.

3.1.2 *block*, *n*—piece of sectioned lump coke or coke drillcore embedded in sample binder.

3.1.3 *briquet*, *n*—cylindrical block composed of granulated coal or coke particles compressed and embedded with a binder.

3.1.4 *microstructure*, *n*—the term given to the size of coke pores and walls.

3.1.5 *microtexture*, *n*—the term given to the isotropic and anisotropic optical properties of metallurgical coke.

4. Summary of Practice

4.1 A representative sample is crushed to a specified particle size, air-dried, mixed with a binder, and formed into a block specimen referred to as a block or briquet.

4.2 Alternatively, a sectioned lump of coke, or coke drillcore, air-dried, is embedded in a suitable binder and formed into a block specimen referred to as a block.

4.3 The block or briquet is then polished to a flat, scratch-free surface for microscopical examination under reflected light.

5. Significance and Use

5.1 Blocks or briquets of coke prepared in accordance with the laboratory procedures of this practice will have flat, scratch-free surfaces suitable for examination with a microscope using reflected light illumination. The polished surface of the blocks or briquets prepared using this practice will contain particles representative of the original gross sample. Polished blocks of coke will preserve the porosity and undisturbed distributions of carbon forms required in the production of sequences of stitched and tiled image mosaics. Such images