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An American National Standard

Standard Practice for Core Sampling of Graphite Electrodes[1]

This standard is issued under the fixed designation C783; 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.

ε[1] NOTE—Updated units of measurement throughout the standard editorially in May 2010.

1. Scope

1.1 This practice was developed for electric-arc furnace graphite electrodes, and covers a procedure and equipment for obtaining core samples from electrodes in a manner that does not destroy the electrode nor prevent its subsequent use as originally intended. However, the minimum electrode diameter, for which extraction of a core sample using this practice does not influence subsequent use, is influenced by the particular application and must be determined by the user. Graphite electrodes for use in electric arc furnaces are usually solid cylinders of graphite with threaded sockets machined in each end.

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

1.3 *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.*

NOTE 1—The following ASTM standards are noted as sources of useful information: Test Methods C559, C611, C651, C747, C1025, and C1039.

2. Referenced Documents

2.1 *ASTM Standards:*[2]

C559 Test Method for Bulk Density by Physical Measurements of Manufactured Carbon and Graphite Articles

C611 Test Method for Electrical Resistivity of Manufactured Carbon and Graphite Articles at Room Temperature

C651 Test Method for Flexural Strength of Manufactured Carbon and Graphite Articles Using Four-Point Loading at Room Temperature

C747 Test Method for Moduli of Elasticity and Fundamental Frequencies of Carbon and Graphite Materials by Sonic Resonance

C1025 Test Method for Modulus of Rupture in Bending of Electrode Graphite

C1039 Test Methods for Apparent Porosity, Apparent Specific Gravity, and Bulk Density of Graphite Electrodes

3. Terminology

3.1 *Definitions:*

3.1.1 *core sample*— the portion of graphite obtained from an electrode by use of a sampling device such as described in 4.1.

3.1.2 *test specimen*—an article prepared from a core sample.

4. Significance and Use

4.1 Core sampling is an acceptable way of obtaining a test specimen without destroying the usefulness of the electrode.

4.1.1 Test specimens obtained by this practice can be used by producers and users of graphite electrodes for the purpose of conducting the tests in Note 1 to obtain comparative physical properties.

4.2 This practice may not provide a test specimen of the appropriate size (with respect to particle size/sample dimension ratios) to allow the determination of absolute property values.

5. Apparatus

5.1 *Core Drill Bit,* similar to that shown in Fig. 1, driven by suitable equipment.

6. Procedure

NOTE 2—When core sampling a machined electrode, use caution to prevent damage to the socket threads and remove all dust from the threads when the coring operation is finished.

6.1 The core sample shall be taken from either end of the electrode as close to the center of the diameter as feasible.

6.2 The core drill bit dimensions shall be such that a core sample with a minimum diameter of 50 mm and a minimum finished length of 191 mm can be obtained.

6.3 Place the core drill bit firmly against the graphite.

6.4 Take care to maintain the bit level and true. Do not stop until the bit is embedded its full length.

[1] This practice is under the jurisdiction of ASTM Committee D02 on Petroleum Products, Liquid Fuels, and Lubricants and is the direct responsibility of Subcommittee D02.F0 on Manufactured Carbon and Graphite Products.

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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.

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