



Standard Practice for Core Sampling of Graphite Electrodes¹

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.

^{ε1} 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

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.

Current edition approved May 1, 2010. Published May 2010. Originally approved in 1974. Last previous edition approved in 2005 as C783 – 85 (2005). DOI: 10.1520/C0783-85R10E01.

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.

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.

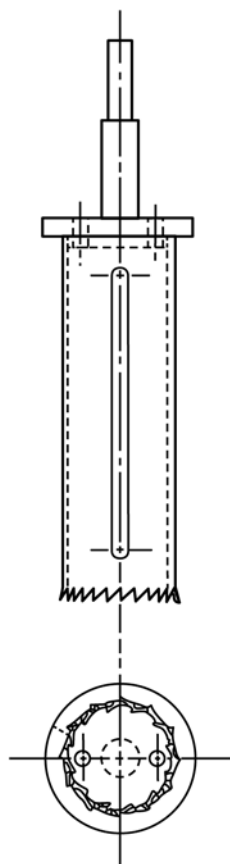


FIG. 1 Typical Core Drill Bit

6.5 To remove the bit, pull and twist it by hand. Do not remove the bit while it is rotating.

6.6 To remove the core sample, insert a wedge between it and the electrode until the core sample snaps.

7. Keywords

7.1 carbon; core; electrodes; graphite; sample; test specimens

ASTM International takes no position respecting the validity of any patent rights asserted in connection with any item mentioned in this standard. Users of this standard are expressly advised that determination of the validity of any such patent rights, and the risk of infringement of such rights, are entirely their own responsibility.

This standard is subject to revision at any time by the responsible technical committee and must be reviewed every five years and if not revised, either reapproved or withdrawn. Your comments are invited either for revision of this standard or for additional standards and should be addressed to ASTM International Headquarters. Your comments will receive careful consideration at a meeting of the responsible technical committee, which you may attend. If you feel that your comments have not received a fair hearing you should make your views known to the ASTM Committee on Standards, at the address shown below.

This standard is copyrighted by ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959, United States. Individual reprints (single or multiple copies) of this standard may be obtained by contacting ASTM at the above address or at 610-832-9585 (phone), 610-832-9555 (fax), or service@astm.org (e-mail); or through the ASTM website (www.astm.org). Permission rights to photocopy the standard may also be secured from the Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923, Tel: (978) 646-2600; http://www.copyright.com/