



Designation: D6354 – 98 (Reapproved 2008)

Standard Guide for Sampling Plan and Core Sampling of Carbon Cathode Blocks Used in Aluminum Production¹

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1. Scope

1.1 This guide covers sampling of carbon cathode blocks used in the production of aluminum, and details procedures for taking test samples from single cathode blocks. It covers equipment and procedures for obtaining samples from cathode blocks in a manner that does not destroy the block or prevent its subsequent use as originally intended. However, the user must determine the subsequent use of the sampled cathode blocks. Preferred locations for taking samples from single units of cathodes are covered in this guide.

1.1.1 Information for sampling of shaped refractory products, in general, is given in [ISO 5022](#). This standard details the statistical basis for sampling plans for acceptance testing of a consignment or lot. Cathode blocks used in the production of aluminum have specific requirements of sampling, and while the statistical basis for sampling given in [ISO 5022](#) applies, further or modified requirements may also apply.

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](#), [C1039](#), and [C1225](#).

2. Referenced Documents

2.1 ASTM Standards:²

[C559](#) Test Method for Bulk Density by Physical Measure-

¹ This guide 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.

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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.

[ments 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](#)
[C1225 Specification for Fiber-Cement Roofing Shingles, Shakes, and Slates](#)

2.2 ISO Standards:³

ISO 8007-1 Carbonaceous materials used in the production of aluminum - Cathodic blocks - Sampling plan and sampling from single cathodic blocks

ISO 5022 Shaped refractory products - Sampling and acceptance testing

3. Terminology

3.1 Definitions:

3.1.1 *block*—a carbon cathode, a single unit.

3.1.2 *sample*—the portion of carbon obtained from a cathode.

3.1.3 *test specimen*—an article prepared from a sample.

4. Significance and Use

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

4.1.1 Test specimens obtained by this guide can be used by producers and users of cathode blocks for the purpose of conducting the tests in [Note 1](#) to obtain comparative physical properties.

4.2 Sampling shall not weaken the cathode or increase the likelihood of premature failure. Extreme care shall be exercised when taking vertically drilled samples.

³ Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, <http://www.ansi.org>.