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Standard Guide for Measurements on Small Graphite Specimens¹

This standard is issued under the fixed designation D7775; 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 guide covers best practice for properties measurements on small (nonstandard) graphite specimens and requirements for representing properties of the bulk material. This guide is aimed specifically at measurements required on graphites, where there may be constraints on the geometry or volume of the test specimen, or both. The objective of this guide is to provide advice on how the application of selected standards under noncompliant conditions can be tested for suitability.

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, 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

- C559 Test Method for Bulk Density by Physical Measurements of Manufactured Carbon and Graphite Articles
- C565 Test Methods for Tension Testing of Carbon and Graphite Mechanical Materials
- C611 Test Method for Electrical Resistivity of Manufactured Carbon and Graphite Articles at Room Temperature

¹ This guide 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.

- C651 Test Method for Flexural Strength of Manufactured Carbon and Graphite Articles Using Four-Point Loading at Room Temperature
- C695 Test Method for Compressive Strength of Carbon and Graphite
- C714 Test Method for Thermal Diffusivity of Carbon and Graphite by Thermal Pulse Method
- C747 Test Method for Moduli of Elasticity and Fundamental Frequencies of Carbon and Graphite Materials by Sonic Resonance
- C748 Test Method for Rockwell Hardness of Graphite Materials
- C749 Test Method for Tensile Stress-Strain of Carbon and Graphite
- C769 Test Method for Sonic Velocity in Manufactured Carbon and Graphite Materials for Use in Obtaining an Approximate Value of Young's Modulus
- C886 Test Method for Scleroscope Hardness Testing of Carbon and Graphite Materials
- C1161 Test Method for Flexural Strength of Advanced Ceramics at Ambient Temperature
- C1259 Test Method for Dynamic Young's Modulus, Shear Modulus, and Poisson's Ratio for Advanced Ceramics by Impulse Excitation of Vibration
- D7779 Test Method for Determination of Fracture Toughness of Graphite at Ambient Temperature
- D7972 Test Method for Flexural Strength of Manufactured Carbon and Graphite Articles Using Three-Point Loading at Room Temperature
- D8289 Test Method for Tensile Strength Estimate by Disc Compression of Manufactured Graphite
- D8356 Test Method for Sonic Velocity in Manufactured Carbons and Graphite Materials for use in Obtaining Approximate Elastic Constants: Young's Modulus, Shear Modulus, and Poisson's Ratio
- E228 Test Method for Linear Thermal Expansion of Solid Materials With a Push-Rod Dilatometer
- E1461 Test Method for Thermal Diffusivity by the Flash Method

3. Summary of Guide

3.1 There is currently a suite of ASTM standards (see 2.1) that can be applied to graphite covering a range of physical, mechanical, electrical and thermal property measurements.

*A Summary of Changes section appears at the end of this standard