



Designation: C135 – 96 (Reapproved 2022)

Standard Test Method for True Specific Gravity of Refractory Materials by Water Immersion¹

This standard is issued under the fixed designation C135; 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.

This standard has been approved for use by agencies of the U.S. Department of Defense.

1. Scope

1.1 This test method covers the determination of true specific gravity of refractory materials under prescribed conditions. It is not applicable to materials attacked by water.

1.2 *Units*—The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.2.1 *Exception*—The equipment used in this standard for weights and volumes is only available in SI units.

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

C604 Test Method for True Specific Gravity of Refractory Materials by Gas-Comparison Pycnometer

D153 Test Methods for Specific Gravity of Pigments

E11 Specification for Woven Wire Test Sieve Cloth and Test Sieves

¹ This test method is under the jurisdiction of the ASTM Committee C08 on Refractories and is the direct responsibility of Subcommittee C08.03 on Physical Properties.

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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.

3. Significance and Use

3.1 The true specific gravity of a material is the ratio of its true density, determined at a specific temperature, to the true density of water, determined at a specific temperature. Thus, the true specific gravity of a material is a primary property which is related to chemical and mineralogical composition.

3.2 For refractory raw materials and products the true specific gravity is a useful value for: classification, detecting differences in chemical composition between supposedly like samples, indicating mineralogical phases or phase changes, calculating total porosity when the bulk density is known, and for any other test method which requires this value for the calculation of results.

3.3 This test method is a primary standard method which is suitable for use in specifications, quality control, and research and development. It can also serve as a referee test method in purchasing contracts or agreements.

3.4 Fundamental assumptions inherent in this test method are the following:

3.4.1 The sample is representative of the material in general,

3.4.2 The total sample has been reduced to the particle size specified,

3.4.3 No impurity has been introduced during processing of the sample,

3.4.4 The sample itself is not magnetic and all magnetic material introduced during processing of the sample has been removed,

3.4.5 The material is not hydratable or reactive with water, and

3.4.6 The test method has been conducted in a meticulous manner.

3.4.7 Deviation from any of these assumptions negates the usefulness of the results.

3.5 In interpreting the results of this test method it must be recognized that the specified sample particle size does not guarantee that all closed pores have been eliminated. The amount of residual closed pores may vary between materials or even between samples of the same or like materials, and the specified sample particle size is not the same as that specified