



Standard Test Method for Apparent Density by Physical Measurements of Manufactured Anode and Cathode Carbon Used by the Aluminum Industry¹

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1. Scope

1.1 This test method covers the determination of the apparent density of core samples from manufactured articles of anode and cathode carbon used by the aluminum industry in the production of aluminum.

1.2 The values stated in SI units are to be regarded as the standard. The values given in parentheses are for information only.

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.*

2. Referenced Documents

2.1 ASTM Standards:

C 559 Test Method for Bulk Density by Physical Measurements of Manufactured Carbon and Graphite Articles²

IEEE/ASTM SI 10 Standard for Use of the International System of Units (SI): (The Modern Metric System)³

3. Terminology

3.1 Definitions:

3.1.1 *apparent density*—the weight per unit volume of a substance, including voids inherent in the material tested.

4. Significance and Use

4.1 Apparent density as determined by this test method is a basic material property of importance in manufacturing and application of anode and cathode carbon.

4.2 This test method can be used for quality and process control, material characterization and description, and other purposes.

5. Apparatus

5.1 *Drying Oven*, capable of being controlled to $110 \pm 5^\circ\text{C}$ ($230 \pm 9^\circ\text{F}$).

5.2 *Desiccator*, charged with indicating desiccant.

5.3 *Balance*, capable of weighing to ± 0.01 g.

5.4 *Core Drill*, drill equipped with a diamond core bit capable of producing a core with a minimum diameter of 50 mm with true surface qualities.

5.5 *Cut-Off Saw*, a saw capable of cutting the cored sample resulting in a surface free of chips or gouges.

5.6 *Micrometer*, a micrometer or other measuring device capable of measuring the diameter and length of the prepared sample to an accuracy of 0.001 cm.

6. Preparation of Test Specimens

6.1 Core drill samples with a minimum diameter of 50 mm from the manufactured article in the form of a right circular cylinder.

6.2 Cut samples from the core to a minimum length of 50 mm. It is recommended that triplicate samples from the core be prepared, analyzed, and averaged to attain a result representative of the core apparent density.

6.3 It is the responsibility of the user of this standard to establish the quantity and location of core samples from the manufactured article for testing.

6.4 No particle contained within the sample can be larger than 19 mm. If particles are larger the sample size, quantity, or both, must be increased accordingly to give comparable accuracy in the results.

6.5 During the coring operation, use no lubricant having a boiling point above 100°C . All edges and faces of the specimen should be free of chips or gouges. Ensure that the specimen is free of any residue from the coring operation. Dry the specimen for a minimum of 2 h at 110°C , and then allow it to cool to $25 \pm 5^\circ\text{C}$ in a desiccator. The specimen shall not be removed from the desiccator until immediately prior to weighing.

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²Annual Book of ASTM Standards, Vol 05.05.

³Annual Book of ASTM Standards, Vol 14.02.