



Designation: C 329 – 88 (Reapproved 1999)

Standard Test Method for Specific Gravity of Fired Ceramic Whiteware Materials¹

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1. Scope

1.1 This test method covers the determination of specific gravity of fired ceramic whiteware materials under prescribed conditions.

NOTE 1—This test method is not applicable to materials attacked by water.

1.2 *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:*

D 153 Test Methods for Specific Gravity of Pigments²

E 11 Specification for Wire-Cloth Sieves for Testing Purposes³

3. Significance and Use

3.1 Measurement of specific gravity is a tool for determining the degree of maturation of a ceramic body.

4. Apparatus and Materials

4.1 *Analytical Balance and Weights.*

4.2 *Pycnometers*, of 50-mL capacity, consisting of suitable bottles with capillary tube stoppers.

4.3 *Thermometer*, calibrated at 0.5°C intervals in the room temperature range.

4.4 *Drying Oven.*

4.5 *Weighing Bottle.*

4.6 *Desiccator.*

4.7 *Vacuum Source*—A suitable apparatus to produce a vacuum equivalent to an absolute pressure of less than 1.0-in. (25.4-mm) Hg.

4.8 *Distilled Water*, that has been freshly evacuated, or boiled and cooled, to remove dissolved air.

5. Sample Preparation

5.1 When possible, the sample for test shall consist of at least two pieces totaling 100 to 150 g taken from different portions of the material in such a way as to exclude skin surfaces in so far as possible. The sample shall be selected so as to be representative of the material to be tested.

5.2 The pieces shall be crushed, if necessary, between hardened steel surfaces. The specimen shall then be reduced to 25 to 50 g by quartering, and any magnetic material introduced by crushing shall be removed. This specimen shall be ground in a suitable mortar so that it will pass a 150- μ m (No. 100) sieve, conforming to Specification E 11, or its equivalent. Care shall be taken at all stages of the crushing, grinding, and quartering to minimize the introduction of impurities and retain all material even though difficult to grind.

6. Procedure

6.1 Make all determinations in duplicate. Determine all weights in this procedure to the nearest 0.0001 g.

6.2 Place the ground specimen in a glass weighing bottle and dry to constant weight at 105 to 110°C. Close the bottle with a glass stopper immediately upon removal from the oven.

6.3 Dry the pycnometer and stopper at 105 to 110°C, cool to room temperature in a desiccator, weigh on an analytical balance, and record the weight as p . Fill the pycnometer bottle with distilled water at room temperature, t_1 , insert the stopper, and remove the excess water on the tip of the capillary by means of filter paper. Weigh the pycnometer and contents and record the weight as W_1 . Empty and dry the pycnometer.

6.4 Place about 8 to 12 g of the dried specimen in the dry pycnometer; weigh the pycnometer, stopper, and specimen and record the weight as W . Add distilled water until the bottle is approximately one half full, and, to remove entrapped air, first stir the specimen and water thoroughly with a glass rod. Then remove the glass rod, using a small quantity of distilled water to wash back into the pycnometer any particles of specimen adhering to the rod. Finally subject the specimen and water to a reduced air pressure of less than 1.0-in. (25.4-mm) Hg (abs).

NOTE 2—A suitable method for evacuation of gas is described in 5.5 of Test Methods D 153.

¹ This test method is under the jurisdiction of ASTM Committee C-21 on Ceramic Whitewares and Related Products and is the direct responsibility of Subcommittee C21.03 on Test Methods for Whiteware Properties.

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² *Annual Book of ASTM Standards*, Vol 06.03.

³ *Annual Book of ASTM Standards*, Vol 14.02.