Designation: C 325 – 81 (Reapproved 1997)ε1

AMERICAN SOCIETY FOR TESTING AND MATERIALS
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Standard Test Method for Wet Sieve Analysis of Ceramic Whiteware Clays[1]

This standard is issued under the fixed designation C 325; 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.

ε[1] NOTE—Section 8 was added editorially in October 1997.

1. Scope

1.1 This test method covers the wet sieve analysis of ceramic whiteware clays. This test method is intended for use in testing shipments of clay as well as for plant control tests.

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:*

C 322 Practice for Sampling Ceramic Whiteware Clays[2]

E 11 Specification for Wire-Cloth Sieves for Testing Purposes[3]

3. Apparatus

3.1 *Stirring Device*—A mechanical stirrer with a three-bladed propeller 2 in. (51 mm) in diameter and having a speed of approximately 1700 r/min, or the equivalent, shall be provided.

3.2 *Sieves*—The sieves shall conform to Specification E 11 and shall include the No. 100 (150-µm), No. 140 (106-µm), No. 200 (75-µm) and No. 325 (45-µm) sieves (Note 1). The wire cloth for these sieves shall be woven (not twilled) and shall be mounted in circular metal frames 8 in. (203 mm) in diameter, which shall be so constructed as to permit nesting of two or more sieves. A pan and cover for the sieves shall be provided.

NOTE 1—Equivalent sieves from other standard series, such as the Tyler series, may also be used. If results are to be compared with those obtained with sieves from the ASTM series, it is important that the openings of the sieves used fall within the tolerances specified in Specification E 11 for the corresponding ASTM sieves.

4. Sampling

4.1 The sample shall be obtained in accordance with Practice C 322.

4.2 The sample as received shall be placed in a drying oven at 100 to 110°C for a period of not less than 5 h prior to testing.

5. Procedure

5.1 Transfer duplicate portions, of approximately 250 g of the dried clay sample, weighed to the nearest 0.1 g, to containers of at least 2-L capacity. Wet the clay with 1 L of water and allow to slake for 2 h. If a free-flowing slurry is not produced by this treatment, add another 500 mL of water.

5.2 To ensure complete separation of clay from nonplastic impurities, agitate the slurry by means of a mechanical stirrer (3.1). Continue the stirring between 5 and 10 min.

5.3 Transfer the slaked and stirred sample, without loss, to the finest sieve to be employed in the test, and wash by means of a small jet of water from a ¼-in. (6.4-mm) soft rubber hose attached to a water supply having a pressure not in excess of that of an ordinary city main. The force of the jet may be controlled by compressing the end of the hose between the thumb and forefinger. Take care to avoid loss of sample from splashing. Continue washing until water passing through the sieve shows only traces of sample. Should lumpy material remain on the screen, return the residue to the stirrer container by careful washing with a gentle jet of water, and agitate in approximately 1 L of water for 10 min, then wash the slurry as previously described.

5.4 Wash the residue remaining on the finest sieve into the pan. Thoroughly wet the remaining sieves to be used in the test with clear water, and nest them in the proper sequence on the finest sieve. Wash the residue in the pan quantitatively onto the top sieve, and give the stack a preliminary washing.

5.5 Nest the top sieve on the pan, which shall contain about ½ in. (12.7 mm) of clear water. Wash the residue by holding the pan and sieve firmly in the hands, and by a sidewise movement, causing water to splash up through the sieve and into the residue. This movement, coupled with interspersed circular motions, allows thorough washing. Wash the residue and water remaining in the pan onto the top sieve of the stack.

5.6 Again fill the pan with the proper amount of water, nest the top sieve and its residue on the pan, and repeat the operation. Continue this until the finest sieve has been washed. Carefully blot each sieve on its underside with a soft, damp sponge, and place the sieve either in a drying oven at 100 to 110°C or under infrared lamps until thoroughly dry. Approximately 2 h is required with a drying oven, but only about 30

[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 C21.04 on Clays.

Current edition approved April 24, 1981. Published November 1981. Originally published as C 325 – 53. Last previous edition C 325 – 53.

[2] *Annual Book of ASTM Standards*, Vol 15.02.

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

min with an infrared lamp set 12 in. (305 mm) above the sieve.

5.7 Nest the dried residues and sieves in the proper order, with due care to prevent dusting of the residues. Close the stack of sieves with a dry pan and cover, and tap the assembly lightly for 1 min on a table top.

5.8 Separate the nested sieves and carefully brush the residue from each onto a weighing paper. Weigh the residues to the nearest 0.001 g on an analytical balance.

6. Calculation and Report

6.1 Calculate the sieve analysis for test sample on the dry weight basis, and report the results to the nearest 0.01 % of the material retained on each sieve. Report the percentage passing the finest sieve as the difference between 100 % and the sum of the percentages retained on the various sieves.

7. Precision and Bias

7.1 The true value of the particle size can be defined only in terms of a test method. Within this limitation, this test method has no known bias.

8. Keywords

8.1 clay; sieve analysis; wet sieve