



Standard Test Method for Lightweight Particles in Aggregate¹

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1. Scope

1.1 This test method covers the determination of the percentage of lightweight particles in aggregate by means of sink-float separation in a heavy liquid of suitable specific gravity.

1.2 The values given 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.* For a specific hazard statement, see 6.1.4.

2. Referenced Documents

2.1 ASTM Standards:

- C 33 Specification for Concrete Aggregates²
- C 125 Terminology Relating to Concrete and Concrete Aggregates²
- C 127 Test Method for Specific Gravity and Absorption of Coarse Aggregate²
- C 128 Test Method for Specific Gravity and Absorption of Fine Aggregate²
- C 702 Practice for Reducing Field Samples of Aggregate to Testing Size²
- C 1005 Specification for Weights and Weighing Devices for Use in the Physical Testing of Hydraulic Cements³
- D 75 Practice for Sampling Aggregates³
- D 3665 Practice for Random Sampling of Construction Materials³
- E 11 Specification for Wire Cloth and Sieves for Testing Purposes⁴
- E 100 Specification for ASTM Hydrometers⁵

¹ This test method is under the jurisdiction of ASTM Committee C-9 on Concrete and Concrete Aggregates and is the direct responsibility of Subcommittee C09.20 on Normal Weight Aggregates.

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² *Annual Book of ASTM Standards*, Vol 04.02.

³ *Annual Book of ASTM Standards*, Vol 04.01.

⁴ *Annual Book of ASTM Standards*, Vol 04.03.

⁵ *Annual Book of ASTM Standards*, Vol 14.02.

3. Terminology

3.1 For definitions of terms used in this test method, refer to Terminology C 125.

4. Significance and Use

4.1 This test method is used to determine conformance with provisions of Specification C 33 pertaining to the amount of lightweight material in fine and coarse aggregates. A heavy liquid with a specific gravity of 2.0 is used to separate particles which may be classified as coal or lignite. Heavier liquids may be used to check the percentages of other lightweight particles such as chert and shale having a specific gravity less than 2.40.

4.2 The test method may be useful in identifying porous aggregate particles in research activities or in petrographic analyses.

5. Apparatus

5.1 *Balances*—For determining the mass of fine aggregates, a balance having a capacity of not less than 500 g, sensitive to at least 0.1 g; for determining the mass of coarse aggregate, a balance having a capacity of not less than 5000 g, sensitive to at least 1 g. Both balances shall conform to the accuracy criterion of the applicable sections of Specification C 1005.

5.2 *Containers*—suitable for drying the aggregate sample, and containers suitable for holding the heavy liquid during the sink-float separation.

5.3 *Skimmer*—A piece of 300- μ m (No. 50) sieve cloth, conforming to Specification E 11, of suitable size and shape for separating the floating particles from the heavy liquid.

5.4 *Hot Plate or Oven*.

5.5 *Sieves*, 300- μ m (No. 50) and 4.75-mm (No. 4) conforming to Specification E 11.

5.6 *Specific Gravity Measurement*—A hydrometer conforming to the physical requirement sections for individual hydrometers of Specification E 100, or a suitable combination of graduated glassware and balance capable of measuring the liquid specific gravity within ± 0.01 .

6. Heavy Liquid

6.1 The heavy liquid shall consist of one of the following (see 6.1.4):

6.1.1 A solution of zinc chloride in water (for a specific gravity up to about 2.0).