



Standard Test Methods for Apparent Density of Chemical-Resistant Mortars, Grouts, Monolithic Surfacing, and Polymer Concretes¹

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1. Scope

1.1 These test methods cover the procedures for determining the uncured (wet) and conditioned (dry) densities of resin, silicate, silica, and sulfur-based chemical-resistant mortars, grouts, monolithic surfacings, and polymer concretes.

1.2 *Density Method I: Apparent Uncured Density of Resin, Silica, and Silicate Materials*—This test method is not applicable to sulfur materials.

1.3 *Density Method II: Apparent Conditioned Density of Resin and Sulfur-based Materials*—This test method may be applicable to silica or silicate materials if they are not water-sensitive.

1.4 *Density Method III: Apparent Conditioned Density of Silica and Silicate Materials that are Water Sensitive.*

1.5 *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 470 Specification for Molds for Forming Concrete Test Cylinders Vertically²

C 904 Terminology Relating to Chemical-Resistant Non-metallic Materials²

C 1312 Practice for Making and Conditioning Chemical-Resistant Sulfur Polymer Cement Concrete Test Specimens in the Laboratory²

3. Terminology

3.1 *Definitions*—For definitions of terms used in these test methods, see Terminology C 904.

4. Significance and Use

4.1 The results obtained by these test methods may be used for estimating purposes, as a means of checking on uniformity

of a product, or even to help identify a specific product. Differences between uncured and conditioned densities may also be a measure of the loss or absorption of solvents, salts, plasticizers, etc.

5. Apparatus

5.1 *Balance for Determining Density*, capable of weighing to four significant numbers. The balance should be equipped with either a below-balance weighing hook or a “pan straddle” or similar support plus wire assembly basket or loop to allow for density determinations.

5.2 *Equipment for Mixing Resin, Silica, and Silicate Materials*—Use a flat-bottom container of suitable size, preferably made of corrosion-resistant metal or porcelain, and a trowel having a 4 to 5 in. (100 to 125 mm) blade.

5.2.1 *Equipment for Mixing Sulfur Materials*—Use a stainless steel or cast iron pot for melting the material along with a power-driven revolving paddle mixer.

5.3 Specimen Molds:

5.3.1 *Mold Method A*—These molds shall be right cylinders $1 \pm \frac{1}{16}$ in. (25 ± 1.6 mm) in diameter by $1 \pm \frac{1}{16}$ in. high. The molds may be constructed in any manner that will allow formation of a test specimen of the desired size. Typical molds consist of a 1-in. (25-mm) thick, flat plastic sheet in which 1 in. diameter, smooth-sided holes have been cut, and to the bottom of which a $\frac{1}{4}$ in. (6 mm) thick, flat plastic sheet (without matching holes) is attached by means of screws or bolts. Alternately, the molds may consist of sections of round plastic tubing or pipe, 1 in. inside diameter and 1 in. long, having sufficient wall thickness to be rigid and retain dimensional stability during the molding operation, and a $\frac{1}{4}$ in. thick, flat plastic sheet on which one open end of each section can be rested. With the latter style of mold, the tubing segment may be sealed with a material, such as caulking compound or stopcock grease. For most types of specimens it is satisfactory to simply seal one end of the tubing segment with masking tape.

NOTE 1—For use with sulfur mortars, an additional piece of flat plastic sheet at least $\frac{1}{8}$ in. (3 mm) thick, containing a $\frac{1}{4}$ in. (6 mm) hole and a section of plastic tubing or pipe 1 in. (25 mm) in diameter by 1 in. high are required. They are used to form a pouring gate and reservoir in the preparation of sulfur mortar specimens.

5.3.2 *Mold Method B*—Molds for the 2 in. (50 mm) cube specimens shall be tight fitting and leakproof. The molds shall have not more than three cube compartments and shall be

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² Annual Book of ASTM Standards, Vol 04.05.