



Standard Test Method for Measuring the Drying Shrinkage of Masonry Mortar¹

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1. Scope

1.1 This test method covers the measurement of unrestrained drying shrinkage of masonry mortars.

1.2 This test method is applicable to Specification C 270 Type N, Type S, and Type M mortars under the property or proportion specifications. Due to the tendency to damage lower strength specimens during demolding, it is not applicable to lower strength mortars, such as Type O mortars.

1.3 This test method is intended for research purposes only.

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

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 109 Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or 50-mm Cube Specimens)²

C 157 Test Method for Length Change of Hardened Hydraulic Cement Mortar and Concrete³

C 270 Specification for Mortar for Unit Masonry⁴

C 305 Practice for Mechanical Mixing of Hydraulic Cement Pastes and Mortar of Plastic Consistency²

C 490 Practice for Use of Apparatus for the Determination of Length Change of Hardened Cement Paste, Mortar, and Concrete²

C 511 Specification for Moist Cabinets, Moist Rooms, and Water Storage Tanks Used in the Testing of Hydraulic Cements and Concretes²

C 778 Specification for Standard Sand²

3. Significance and Use

3.1 The drying shrinkage of mortar as determined by this test method is a measure of the decrease in length of test specimens under controlled drying conditions, after an initial period of moist curing.

3.2 Since test specimens are not completely unrestrained during the initial period of moist curing, measurements of drying shrinkage by this test method are most useful for comparative purposes rather than as absolute values.

3.3 *The drying shrinkage of unrestrained laboratory tested mortar samples is different from that experienced in a masonry wall where influences include restraint, masonry unit absorption, ambient temperature and humidity, thickness of joint, length of continuous wall, etc.*

4. Apparatus

4.1 *Scales and Weights, Glass Graduates, and Length Comparator*, conforming to requirements of Specification C 490.

4.2 *Molds* (for test specimens), providing for 25 by 25 by 285-mm (1 by 1 by 11.25-in.) prisms having an effective gage length of 250 mm (10 in.), and conforming to the requirements of Specification C 490.

4.3 *Studs*, conforming to the requirements of Specification C 490.

4.4 *Tamper and Demolding Apparatus*, conforming to requirements of Test Method C 157.

4.5 *Trowel*, having a straight edged steel blade 100 to 150 mm (4 to 6 in.) in length.

5. Temperature and Humidity

5.1 *Molding Room*—The temperature of the molding room, dry materials, mixing water, and the relative humidity of the air in the molding room shall conform to the requirements of Specification C 490.

5.2 *Moist Storage Facility*—The temperature and humidity of the air in the moist storage facility shall conform to the requirements of Specification C 511.

5.3 *Drying Room and Controls*—The drying room and controls shall conform to the requirements of Test Method C 157.

¹ This test method is under the jurisdiction of ASTM Committee C12 on Mortars for Unit Masonry and is the direct responsibility of Subcommittee C12.02 on Research and Methods of Test.

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² *Annual Book of ASTM Standards*, Vol 04.01.

³ *Annual Book of ASTM Standards*, Vol 04.02.

⁴ *Annual Book of ASTM Standards*, Vol 04.05.