Designation: D1734 – 93 (Reapproved 2022)

Standard Practice for Making Cementitious Panels for Testing Coatings[1]

This standard is issued under the fixed designation D1734; 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.

This standard has been approved for use by agencies of the U.S. Department of Defense.

1. Scope

1.1 This practice covers procedures for molding and curing cementitious panels for use in exposure testing of coatings designed for masonry or cementitious surfaces, although these may be suitable for other tests.

1.2 The values stated 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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.4 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

C109/C109M Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or [50 mm] Cube Specimens)

C150 Specification for Portland Cement

C230/C230M Specification for Flow Table for Use in Tests of Hydraulic Cement

C305 Practice for Mechanical Mixing of Hydraulic Cement Pastes and Mortars of Plastic Consistency

C511 Specification for Mixing Rooms, Moist Cabinets, Moist Rooms, and Water Storage Tanks Used in the Testing of Hydraulic Cements and Concretes

C778 Specification for Standard Sand

C1005 Specification for Reference Masses and Devices for Determining Mass and Volume for Use in Physical Testing of Hydraulic Cements

D4258 Practice for Surface Cleaning Concrete for Coating

D4259 Practice for Preparation of Concrete by Abrasion Prior to Coating Application

D4260 Practice for Liquid and Gelled Acid Etching of Concrete

3. Significance and Use

3.1 Researchers in the field of coatings have recognized the need for a standardized substrate for evaluating coatings intended for use on cementitious surfaces. This practice describes the preparation of such panels.

4. Apparatus

4.1 *Molds*—High density polyethylene molds to make the panels as required.[3]

4.1.1 *Outdoor Exposure Tests,* for use on outdoor exposure testing racks, the panels shall be 200 by 300 by 15 mm (8 by 12 by 9⁄16 in.) in size.

4.1.2 *Machine Exposure Tests,* for machine exposure tests, the typical panel is 75 by 150 by 15 mm (3 by 6 by 9⁄16 in.) in size.

4.1.3 Other sizes to fit specific equipment may be used.

4.2 *Trowel,* rectangular having a steel blade approximately 100 to 150 mm (4 to 6 in.) in length, with straight edges, and 75 to 125 mm (3 to 5 in.) in width is generally recommended.

4.3 *Weights and Weighing Devices,* conforming to the requirements of Specification C1005. The weighing device shall be evaluated for precision and bias at a total load of 2000 g.

4.4 *Mechanical Mixer*—An electrically driven mechanical mixer of the type equipped with a paddle and mixing bowl, as specified in Practice C305.

[1] This practice is under the jurisdiction of ASTM Committee D01 on Paint and Related Coatings, Materials, and Applications and is the direct responsibility of Subcommittee D01.47 on Concrete, Stone and Masonry Treatments.

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[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

[3] The sole source of supply of molds known to the committee at this time is the American Cube Mold, Macedonia, OH 44056. If you are aware of alternative suppliers, please provide this information to ASTM International Headquarters. Your comments will receive careful consideration at a meeting of the responsible technical committee,[1] which you may attend.

4.5 *Flow Table,* as described in Specification C230/C230M.

5. Materials

5.1 *White Portland Cement,* conforming to the requirements of Type I of Specification C150.

5.2 *Graded Standard Sand,* conforming to the requirements of Specification C778.

6. Procedure

6.1 *Preparation of Material*—Mix the cement:sand:water in a ratio of 1:2:0.43 to obtain a flow of 110 ± 5 %, when determined as specified in Determination of Flow in the Procedure Section of Test Method C109/C109M. Typically, for three large test panels, weigh out 1800 g of portland cement, 3600 g of graded sand and 770 g of water. For three small test panels, use 350 g of portland cement, 700 g of sand and 150 g of water.

NOTE 1—Minor adjustments to the flow may be made by the addition or subtraction of small amounts of sand.

6.2 *Forming Panels:*

6.2.1 Place the mixture in the mold and spread thoroughly within 5 min of mixing. Use the trowel to distribute the mixture and to compact and level it. Tip the trowel slightly, about 30° from horizontal, and trowel the mixture from end to end several times to achieve compactness and leveling, using only a slight hand pressure. Again, use the edge of the trowel to strike excess material from the surface and then, holding the trowel almost flat, slowly make only a sufficient number of passes to produce a smooth and dense surface.

NOTE 2—Excessive working of a fresh surface may create a cement rich top coat.

6.2.2 As the sheen from the water disappears from the panel face (approximately 45 to 60 min), trowel the surface again to a hard smooth finish or texture the surface as required.

6.2.3 In between trowellings, keep the tools dry and clean. Do not use water on the panel surface nor on the trowel during this initial curing period, since this disturbs and weakens the surface by changing the water:cement ratio.

6.3 *Moist Curing of Panels:*

6.3.1 Immediately after finishing the surface, place the panels in a moist chamber conforming to Specification C511 or cover and seal them in plastic wrap, taking care as to prevent the plastic from having contact with the panel face.

6.3.2 Continue curing for at least seven days under moist conditions as specified in 6.3.1.

NOTE 3—For optimum repeatability of test results, panels used in the same test should be from the same batch. The moisture content and age of the test panel could also have an effect on test results. Panels older than twelve months should not be used.

NOTE 4—Test panels shall be formed in smooth surfaced molds and no form oil or other contaminants shall come in contact with the panel surface.

NOTE 5—Surface preparation of the panels before use is beyond the scope of this practice. Guides for surface preparation can be found in Practices D4258, D4259 and D4260.

7. Keywords

7.1 cementitious panels; mortar panels; paint testing panels