Designation: C1486 – 00 (Reapproved 2012)

Standard Practice for Testing Chemical-Resistant Broadcast and Slurry-Broadcast Resin Monolithic Floor Surfacings[1]

This standard is issued under the fixed designation C1486; 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.

1. Scope

1.1 This practice covers methods for preparing test specimens and testing procedures for broadcast or slurry-broadcast monolithic floor surfacings in areas where chemical resistance is required.

1.2 These floor surfacings are applied by various application methods including squeegees, rollers, trowels, notched trowels, and gage rakes onto suitably prepared concrete substrates. The surfacings bond to the substrate upon curing to provide a nominal thickness of 60 mils (1.5 mm) or greater.

1.3 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.4 *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:*[2]

C413 Test Method for Absorption of Chemical-Resistant Mortars, Grouts, Monolithic Surfacings, and Polymer Concretes

C811 Practice for Surface Preparation of Concrete for Application of Chemical-Resistant Resin Monolithic Surfacings (Withdrawn 2012)[3]

C904 Terminology Relating to Chemical-Resistant Nonmetallic Materials

C905 Test Methods for Apparent Density of Chemical-Resistant Mortars, Grouts, Monolithic Surfacings, and Polymer Concretes

C1028 Test Method for Determining the Static Coefficient of Friction of Ceramic Tile and Other Like Surfaces by the Horizontal Dynamometer Pull-Meter Method

D635 Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position

D790 Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials

D1308 Test Method for Effect of Household Chemicals on Clear and Pigmented Organic Finishes

D2047 Test Method for Static Coefficient of Friction of Polish-Coated Flooring Surfaces as Measured by the James Machine

D4060 Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser

D4541 Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers

2.2 *ACI Standards:*

ACI 503R, Appendix A, Test Method A.1, Field Test for Surface Soundness and Adhesion[4]

3. Terminology

3.1 *Definitions*—For definitions of terms relating to this standard, refer to Terminology C904.

4. Significance and Use

4.1 Because the sample is prepared in a manner as it would be applied in the field, the test specimens may be considered representative of the application of a specified surfacing. Such methods include application by squeegees, rollers, trowels, notched trowels, and gage rakes.

4.2 These systems vary in several ways, including the number of layers or application steps, the surface finish, and variation in composition.

4.3 The results obtained in carrying out this practice should serve as a guide in comparing similarly applied surfacings. No

[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 D01.46 on Industrial Protective Coatings.

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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 last approved version of this historical standard is referenced on www.astm.org.

[4] Available from American Concrete Institute (ACI), P.O. Box 9094, Farmington Hills, MI 48333-9094, http://www.concrete.org.

attempt has been made to incorporate into this practice all of the various factors that may affect the performance of such applications when subjected to actual service.

5. Types of Resins, Fillers, and Setting Agents (Hardeners)

5.1 The liquid resins may be epoxy, polyester, vinyl ester, or others capable of forming chemical-resistant surfacing material when mixed with a suitable setting agent and filler.

5.2 The fillers may be silica, carbon, or other chemical-resistant materials. The filler may also be combined as a premix with the liquid resin or the setting agent.

5.3 The setting agent (hardener) is usually supplied separately and added to the resin prior to use in accordance with the manufacturer's recommendations.

6. Sample Preparation

6.1 A36 in. by 36 in. (900 mm by 900 mm) piece of suitable material that will allow the release of the applied surfacing after it has hardened shall be positioned on a rigid horizontal surface.

NOTE 1—A5 mil polyethylene terephthalate sheet has been found suitable.

6.2 The floor surfacing shall be applied in accordance with the manufacturer's recommendations to a nominal thickness as it would be specified in an actual installation.

6.2.1 The standard temperature of the system constituents, the horizontal surface, and the temperature in the vicinity of the mixing and application area shall be 73.4 ± 4°F (23 ± 2.2°C) unless otherwise specified by the manufacturer. The actual temperature(s) shall be recorded.

6.3 After the system has been applied, age the prepared sample for a period of 7 days at 73.4 ± 4°F.

6.4 Using a wet cutting saw, trim 6 in. (150 mm) off each side of the 36 in. by 36 in. cured sample to yield a 24 in. by 24 in. (610 mm by 610 mm) representative sample, free of any edge effects.

7. Thickness Test

7.1 Starting at any corner of the 24 in. by 24 in. representative surfacing sample, and approximately 1 in. (25 mm) in from the edge, use a micrometer and measure the thickness of the sample at approximately 6 in. (150 mm) intervals along the perimeter of the sample. Record the individual thickness readings and the average of the individual readings. The average value shall be reported as the cured thickness of the surfacing.

8. Abrasion Test

8.1 Test specimens as required by Test Method D4060 shall be cut from the 24 in. by 24 in. representative surfacing sample using a wet cutting saw.

8.2 The abrasion resistance of the surfacing shall be determined in accordance with Test Method D4060. A CS17 wheel with a 1000 g weight shall be operated for 5000 cycles and the average milligram of weight loss per 1000 cycles shall be reported. For more abrasion resistant floors a H-22 wheel may be used.

9. Flexural Strength and Modulus of Elasticity

9.1 Test specimens as required by Test Methods D790 shall be cut from the representative surfacing sample using a wet cutting saw.

9.2 The flexural strength and the modulus of elasticity shall be determined in accordance with Test Methods D790.

NOTE 2—Flexural strengths on systems less than ⅛ in. (3 mm) thick may give erratic and questionable results.

9.2.1 Test pieces shall be placed in the testing apparatus such that the center loading nose will be applied to the top face of the test specimen.

10. Chemical Resistance

10.1 Dependent upon the chemical resistance that is required of the system, either immersion testing or "spot" testing shall be used.

10.1.1 For chemical-resistant immersion testing, the test specimens shall be the same as those required by Test Methods D790 and shall be cut from the representative surfacing sample using a wet cutting saw.

10.1.2 The test conditions (test media, temperature, etc.) shall simulate the anticipated service conditions as closely as possible.

10.1.3 The number of test specimens required is dependent upon the number of test media to be employed, the number of different temperatures at which testing is performed, and the frequency of test intervals. The test specimens shall consist of sets of three for one medium at a single temperature and for each test interval. In addition, other sets of at least three, equivalent to the number of test temperatures, shall be available for the total test period. Calculate the total number of specimens required as follows:

$$N = n(M \times T \times I) + nT + n \quad (1)$$

where:

N = number of specimens,
n = number of specimens for a single test,
M = number of media,
T = number of test temperatures, and
I = number of test intervals.

10.1.4 Using a micrometer, measure the length, width, and thickness of each test specimen to the nearest 0.001 in. (0.0254 mm). Using a volume displacement in water method, determine the volume of the specimen to the nearest 0.01 cc.

10.1.5 Specimens shall be dried in an oven to constant weight. Each specimen shall be weighed to the nearest 0.001 g on an analytical balance and the weight recorded.

10.1.6 Using a Shore Hardness Tester, measure and record the hardness of each specimen.

10.1.7 Prior to immersion, record a brief description of the color and surface appearance of the specimens and the color and clarity of the test medium.

10.1.8 Place the test specimens in a suitable container or containers, taking care to prevent the specimens from coming