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Standard Specification for Reinforced Liquid Coating Encapsulation Products for Leaded Paint in Buildings[1]

This standard is issued under the fixed designation E1797; 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.

ε[1] NOTE—Editorial changes were made throughout in October 2017.

1. Scope

1.1 This specification covers minimum material performance requirements and laboratory test procedures for reinforced liquid coating encapsulation products (single- or multiple-coat systems) for leaded paint in buildings. Performance properties addressed in this specification are:

1.1.1 Impact Resistance,
1.1.2 Adhesion,
1.1.3 Dry Abrasion Resistance,
1.1.4 Water Vapor Transmission,
1.1.5 Water and Chemical Resistance,
1.1.6 Surface Burning Characteristics,
1.1.7 Volatile Organic Compound (VOC) Content,
1.1.8 Weathering,
1.1.9 Aging,
1.1.10 Scrub Resistance,
1.1.11 Mildew Resistance,
1.1.12 Paintability/Repairability,

1.2 This specification does not address the selection of an encapsulation product for specific use conditions. Specific use conditions may require performance values other than those stated in this specification. See Guide E1796 for guidance.

1.3 This specification complements Specification E1795 for non-reinforced liquid coating encapsulation products.

1.4 This specification does not cover the use of encapsulation products on industrial steel structures nor residential exterior coated metal surfaces because no corrosion control requirements are included.

1.5 This specification applies to any liquid-applied product incorporating reinforcement materials as part of the system. Reinforcement materials are continuous fabric or mesh and are applied in the field. These materials are typically applied between a base and top coat. These products are used to encapsulate a leaded paint surface with the intent of reducing human exposure to lead in paint.

1.6 The results of the test methods included in this specification will not necessarily predict field performance.

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

1.8 *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.*

1.9 *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]

D16 Terminology for Paint, Related Coatings, Materials, and Applications
D823 Practices for Producing Films of Uniform Thickness of Paint, Coatings and Related Products on Test Panels
D1005 Test Method for Measurement of Dry-Film Thickness of Organic Coatings Using Micrometers
D1212 Test Methods for Measurement of Wet Film Thickness of Organic Coatings
D1308 Test Method for Effect of Household Chemicals on Clear and Pigmented Organic Finishes
D1475 Test Method for Density of Liquid Coatings, Inks, and Related Products
D1653 Test Methods for Water Vapor Transmission of Organic Coating Films

[1] This specification is under the jurisdiction of ASTM Committee D22 on Air Quality and is the direct responsibility of Subcommittee D22.12 on Sampling and Analysis, of Lead, for Exposure and Risk Assessment.

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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.

D2486 Test Methods for Scrub Resistance of Wall Paints
D2794 Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact)
D3273 Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber
D3274 Test Method for Evaluating Degree of Surface Disfigurement of Paint Films by Fungal or Algal Growth, or Soil and Dirt Accumulation
D3359 Test Methods for Rating Adhesion by Tape Test
D3924 Specification for Standard Environment for Conditioning and Testing Paint, Varnish, Lacquer, and Related Materials (Withdrawn 2016)[3]
D3925 Practice for Sampling Liquid Paints and Related Pigmented Coatings
D3960 Practice for Determining Volatile Organic Compound (VOC) Content of Paints and Related Coatings
D3891 Practice for Preparation of Glass Panels for Testing Paint, Varnish, Lacquer, and Related Products
D4060 Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser
D4214 Test Methods for Evaluating the Degree of Chalking of Exterior Paint Films
D4414 Practice for Measurement of Wet Film Thickness by Notch Gages
D4541 Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers
D7091 Practice for Nondestructive Measurement of Dry Film Thickness of Nonmagnetic Coatings Applied to Ferrous Metals and Nonmagnetic, Nonconductive Coatings Applied to Non-Ferrous Metals
E84 Test Method for Surface Burning Characteristics of Building Materials
E1605 Terminology Relating to Lead in Buildings
E1795 Specification for Non-Reinforced Liquid Coating Encapsulation Products for Leaded Paint in Buildings
E1796 Guide for Selection and Use of Liquid Coating Encapsulation Products for Leaded Paint in Buildings
E2239 Practice for Record Keeping and Record Preservation for Lead Hazard Activities
G154 Practice for Operating Fluorescent Ultraviolet (UV) Lamp Apparatus for Exposure of Nonmetallic Materials

2.2 *Federal Test Methods Standard 141C:*[4]
2011 Preparation of Steel Panels
2012 Preparation of Tin Panels

2.3 *Federal Test Methods Standard 141D:*[4]
3011 Condition in Container

3. Terminology

3.1 *Definitions*—For definitions of terms used in this specification, refer to Terminologies D16 and E1605.

4. Classification

4.1 *Type I: Interior Use Only*—Type I defines encapsulation products intended for interior use. These products shall meet the requirements of this specification except those for weathering and exterior aging (for example, test methods described in 10.9 and 10.10.1 not conducted).

4.2 *Type II: Exterior Use Only*—Type II defines encapsulation products intended for exterior use. These products shall meet the requirements of this specification except that for interior aging (for example, test method 10.10.2 not conducted).

4.3 *Type III: Either Exterior or Interior Use*—Type III defines encapsulation products intended for either interior or exterior use. These products shall meet all the requirements of this specification.

5. Performance Requirements

5.1 Performance requirements that shall be met for a reinforced liquid coating encapsulation product are given in Table 1.

NOTE 1—In addition to those given in Table 1, performance requirements for three other properties are of concern for liquid coating encapsulation products. These are combustion toxicity, emissions during application and curing, and lead accessibility. However, requirements for these properties cannot be included in this specification at this time because there are no adequate ASTM or Federal test methods for determining them. Requirements for two of these properties, combustion toxicity and emissions during application and curing, may be subject to regulations or ordinances promulgated by authorities having jurisdiction. The user of this specification is advised to determine whether such regulations or ordinances exist. The addition of requirements for these properties to this specification will be undertaken when suitable test methods are available.

6. Sampling

6.1 A 3.8-L (1-gal) sample of the encapsulant coating is usually sufficient for conducting the specified tests.

6.2 Prior to sampling, establish the condition of the container since damage to it may cause evaporation, skinning, or other undesirable effects. Excessive storage time and temperature fluctuations may cause settling or changes in viscosity. Materials beyond the manufacturer's stated shelf life shall not be sampled. Reinforcement materials shall be evaluated to ensure they are undamaged.

6.3 Thickening, settling, and separation are undesirable and objectionable if the coating cannot be readily made suitable for application with a reasonable amount of stirring. Determine the conditions in the container in accordance with Method 3011 of Federal Test Method Standard No. 141C.

6.4 Sample the encapsulation product in accordance with Practice D3925. Determine the density in accordance with Test Method D1475, and repeat until two successive readings agree within 90 g (0.2 lb). Samples for testing may then be taken.

6.5 Report the size of the container from which the sample was taken and product identification codes.

7. Number of Tests

7.1 The number of tests that shall be conducted for each performance property is given in Table 1.

[3] The last approved version of this historical standard is referenced on www.astm.org.
[4] Available from DLA Document Services, Bldg. 4/D, 700 Robbins Ave., Philadelphia, PA 19111-5094, http://quicksearch.dla.mil.

TABLE 1 Performance Requirements For Reinforced Liquid Coating Encapsulation Products

Performance Property	Minimum Performance Requirement	Tested in Accordance with Paragraph	Minimum Number of Tests
Impact resistance	9 J (80 in. lbf) without cracking to the substrate	10.2	Two panels
Adhesion	700 kPa (100 lbf/in.^{2})	10.3	Three panels
Dry abrasion resistance	For all reinforcements: no abrasion through the reinforcement after 1000 cycles Additionally, for mesh-type reinforcements: coating present within the mesh	10.4	Two panels
Water vapor transmission	No minimum; report test result[A]	10.5	Three cups
Water and chemical resistance—spot test	After 1 h recovery period, no evidence of blistering, cracking, or delamination After 24 h recovery, indistinguishable hardness of the exposed and unexposed surfaces	10.6/10.6.1	Two tests for each reagent
Water and chemical resistance—immersion test	After 1 h recovery period, no evidence of blistering, cracking, or delamination After 24 h recovery period, indistinguishable hardness of the exposed and unexposed surfaces	10.6/10.6.2	One panel examined in each of three locations
Surface burning characteristics	Flame spread index (FSI) <25 Smoke development rating <50	10.7	One panel
Volatile organic compound (VOC) content	No minimum; report test result[B]	10.8	See Practice D3960
Weathering—exterior end-use products	After exposure: chalking: 8 rating adhesion: 700 kPa (100 lbf/in.^{2})	10.9	three panels
Aging—exterior end-use products	After a >6 h recovery period after completing exposure: adhesion: 700 kPa (100 lbf/in.^{2})	10.10.1	Three panels
Aging—interior end-use products	After a >6 h recovery period after completing exposure: adhesion: 700 kPa (100 lbf/in.^{2})	10.10.2	Three panels
Scrub resistance	No erosion of the encapsulant to the substrate after 1200 cycles	10.11	Two panels
Mildew resistance	Mildew resistance rating: 8	10.12	Three panels
Paintability	Adhesion rating: 5A	10.13.1	Two panels each tested at three locations
Repairability	Adhesion: 700 kPa (100 lbf/in.^{2})	10.13.2	Three panels

[A] Minimum performance depends on architectural and end use conditions (see 1.2).
[B] VOC requirements may be specified in ordinances promulgated by authorities having jurisdiction.

8. Retesting

8.1 In cases where encapsulation products fail to pass one or more requirements of this specification, retesting shall be permitted. Both the original data and the retesting data for each requirement for which retesting was conducted shall be used in determining whether the requirement is met.

9. Test Specimens

9.1 An encapsulation product shall be comprised of all principal components in the system, including the base and topcoats, the reinforcement material, and primer, if specified, for field application. Except for dry abrasion and adhesion testing, where specialty primers may be used for flash rust resistance, primers shall not be used solely for product performance testing in accordance with this specification.

9.2 *Preparation of Test Panels:*

9.2.1 The test specimen (substrate) shall be the encapsulant-coated test panel.

9.2.2 Prior to product application, the tin-plated steel panels shall be solvent cleaned in accordance with Method 2012 of the Federal Test Method Standard No. 141C. Supplement the test panel cleaning procedure with an additional cleaning so that water wets the entire surface of the panel. Dry and wipe clean.

9.2.3 Product application shall be performed using the draw-down procedure, where applicable, in accordance with Practices D823. Determine the dry-film thickness in accordance with Test Method D1005 for free films or Practice D7091 for films on steel panels except when the manufacturer's written instructions reference only wet-film thickness. In this case, measure wet-film thickness in accordance with Test Methods D1212 or Practice D4414. If a range of thickness is specified by the manufacturer for field application, the minimum value of this range shall be used for product testing in accordance with this specification. The dry-film thickness shall remain constant for all tests.