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Standard Specification for High-Solids Content, Cold Liquid-Applied Elastomeric Waterproofing Membrane With Integral Wearing Surface¹

This standard is issued under the fixed designation C957/C957M; 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 specification describes the required properties and test methods for a cold liquid-applied elastomeric membrane for waterproofing building decks not subject to hydrostatic pressure. The specification applies only to a membrane system that has an integral wearing surface. This specification does not include specific requirements for skid resistance or fire retardance, although both may be important in specific uses.

1.2 The type of membrane system described in this specification is used for pedestrian and vehicular traffic and in high-abrasion applications. The membrane may be single- or multi-component, and may consist of one or more coats (for example base coat, top coat, etc.). The coat(s) may be built to the desired thickness in one or more applications. One coat (base coat) provides the primary waterproofing function and normally comprises the major amount of organic material in the membrane. The function of the top coat(s) is to resist wear and weather. Aggregate may be used as a component of the membrane system, as all or part of a course, to increase wear and skid resistance.

1.3 The committee with jurisdiction over this standard is not aware of any comparable standards published by other organizations.

1.4 Test methods in this specification require a minimum 0.5-mm [0.020-in.] base coat dry film thickness. Actual thickness required for a particular application and the use of aggregate in topcoats shall be established by the membrane manufacturer.

1.5 The values stated in either SI units or inch-pound units are to be regarded separately as standard. The values stated in each system may not be exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in non-conformance with the standard.

1.6 The following safety hazards caveat pertains only to the test method portion, Section 5, of this specification: *This standard does not purport to address all of the safety problems, 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

- C501 Test Method for Relative Resistance to Wear of Unglazed Ceramic Tile by the Taber Abraser
- C794 Test Method for Adhesion-in-Peel of Elastomeric Joint Sealants
- C1305 Test Method for Crack Bridging Ability of Liquid-Applied Waterproofing Membrane
- C1442 Practice for Conducting Tests on Sealants Using Artificial Weathering Apparatus
- D412 Test Methods for Vulcanized Rubber and Thermoplastic Elastomers—Tension
- D471 Test Method for Rubber Property—Effect of Liquids
- D609 Practice for Preparation of Cold-Rolled Steel Panels for Testing Paint, Varnish, Conversion Coatings, and Related Coating Products
- D1079 Terminology Relating to Roofing and Waterproofing
- D1133 Test Method for Kauri-Butanol Value of Hydrocarbon Solvents
- D2370 Test Method for Tensile Properties of Organic Coatings
- D6511 Test Methods for Solvent Bearing Bituminous Compounds
- G113 Terminology Relating to Natural and Artificial Weathering Tests of Nonmetallic Materials

¹ This specification is under the jurisdiction of ASTM Committee D08 on Roofing and Waterproofing and is the direct responsibility of Subcommittee D08.25 on Liquid Applied Polymeric Materials Used for Roofing and Waterproofing Membranes that are Directly Exposed to the Weather.

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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.

2.2 *U.S. Department of Commerce Standard: Product Standard PS-1, Construction and Industrial Plywood*³

3. Terminology

3.1 *Definitions*—Refer to Terminology **D1079** for definitions of terms used in this guide.

3.2 The definitions given in Terminology **G113** for terms related to natural and artificial weathering tests are applicable to this specification.

4. Physical Requirements

4.1 *Material*—Membrane materials shall cure, after application by spreading or spraying, to form an elastomeric film system composed of one or more layers and capable of maintaining a seal against water despite the existence or development of small (1.6 mm [$\frac{1}{16}$ in.] maximum) cracks in the substrate. It must maintain complete integrity under pedestrian or vehicular traffic.

4.2 The physical, mechanical, and performance properties of the membrane shall conform to the requirements described in **Table 1**.

5. Test Methods

5.1 *Standard Conditions*—Standard conditions for all tests shall be $23 \pm 2^\circ\text{C}$ [70 to 77°F] and $50 \pm 5\%$ relative humidity:

5.2 *Conditioning and Mixing:*

5.2.1 Store all membrane materials to be tested in an unopened container at standard conditions for at least 24 h before preparing any test specimens.

5.2.2 Follow the manufacturer's instructions for all mixing and preparation of membrane materials.

5.3 *Substrates*—In addition to the substrates specified herein, conduct tests on such other substrates as may be required by the specifier.

³ Available from Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

5.4 *Primer*—When required by the manufacturer, use a primer, as directed by the manufacturer, on all substrate materials in all test assemblies.

5.5 *Low-Temperature Crack Bridging*—Perform the test as specified in Test Method **C1305** with the following exceptions.

5.5.1 Test the total membrane system (primers, base coat(s) and top coat(s)) including any aggregate specified. Total thickness of the cured membrane, excluding aggregate, shall be a minimum of 0.5 mm [0.020 in.].

5.5.2 Extend the blocks until the space between each is 1.6 mm [$\frac{1}{16}$ in.] rather than 3.2 mm [$\frac{1}{8}$ in.].

5.6 *Adhesion-in-Peel after Water Immersion*—Perform the test as specified in Test Method **C794** with the following qualifications:

5.6.1 Cement mortar shall be used as the test substrate. Additional substrates, such as plywood, shall be used when specified.

5.6.2 Test only the base coat and any primer.

5.6.3 Cast the base coat in the thickness specified by the manufacturer for one coat of the base coat, or the wet-film thickness necessary to attain a dry-film thickness of 0.5 mm [0.020 in.], whichever is greater. Follow the instructions of the manufacturer regarding the time of placement of the airplane cloth or aluminum screen.

5.6.4 For testing on plywood, use the A side of Exterior Type Marine Grade AA, AB, or AC plywood conforming to U.S. Department of Commerce, Plywood Standard PS-1 as the substrate.

5.6.5 The sample shall be cured 2 weeks at standard conditions followed by 1 week at 70°C [158°F].

5.7 *Chemical Resistance*—Perform the test for change in tensile strength as specified in Test Method **D471**, with the following qualifications:

5.7.1 Cast test samples of the base coat to a minimum cured thickness of 0.5 mm [0.020 in.] in accordance with the directions of the manufacturer. Test any required top coats separately from the base coat. Cast the top coat test samples according to Method A of Test Methods **D412** or, in the case of coatings thinner than 0.16 mm [6.25 mils], by Test Method **D2370**.

TABLE 1 Requirements

Property	Requirement	Test Method
Weight loss of base coat, ^A max, %	40	D6511 as modified in 5.11
Low temperature crack bridging	No cracking in base coat	C1305 as modified in 5.5 of this specification C794 as modified in 5.6 of this specification
Adhesion-in-peel after water immersion, min, N [lbf]		
Cement mortar substrate	22.2 [5]	
Plywood substrate	13.3 [3]	
Chemical resistance, min, avg % tensile retention		D471 as modified in 5.7 of this specification
Water exposure	70	
Ethylene glycol exposure	70	
Mineral spirits exposure	45	
Weathering resistance and recovery from elongation, min, %		5.8 of this specification
Recovery from elongation, initial	90	
Tensile retention	80	
Elongation retention	90	
Abrasion resistance, max, mg [oz.]	50 [0.002]	C501 as modified in 5.9 of this specification
Stability, min, months	6	5.10 of this specification

^A A separate top coat or primer, or both, if required by manufacturer, shall comply with the manufacturer's specifications.