Designation: C1315 – 19

Standard Specification for Liquid Membrane-Forming Compounds Having Special Properties for Curing and Sealing Concrete[1]

This standard is issued under the fixed designation C1315; 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 provides requirements for membrane-forming liquids suitable for use as curing compounds and sealers on freshly placed concrete and as sealers on hardened concrete. These membranes have special properties, such as, alkali resistance, acid resistance, adhesion-promoting qualities, and resistance to degradation by UV light.

NOTE 1—For liquid membrane-forming curing compounds specified primarily by their ability to retain water in newly placed concrete (and by drying time, and for white pigmented products, reflectance), see Specification C309.

1.2 This is a performance specification. The allowable composition of products covered by this specification is limited by various local, regional, and national regulations. Issues related to air quality (solvent emission), worker exposure, and other hazards are not addressed here. It is the responsibility of the producers and users of these materials to comply with pertinent regulations.

Warning—Some VOC exempt solvents used to meet the regulations are extremely flammable with low auto ignition temperatures and rapid evaporation rates. Consult the manufacturer's product information sheet for important application and safety information.

1.3 The values stated in SI units are to be regarded as the standard. (Inch pound units are shown in parentheses).

1.4 The following precautionary caveat pertains only to the test methods portion, Section 9, of this specification. *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.*

1.5 *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]

C125 Terminology Relating to Concrete and Concrete Aggregates

C156 Test Method for Water Loss [from a Mortar Specimen] Through Liquid Membrane-Forming Curing Compounds for Concrete

C309 Specification for Liquid Membrane-Forming Compounds for Curing Concrete

D869 Test Method for Evaluating Degree of Settling of Paint

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

D1309 Test Method for Settling Properties of Traffic Paints During Storage

D1544 Test Method for Color of Transparent Liquids (Gardner Color Scale)

D1734 Practice for Making Cementitious Panels for Testing Coatings

D2369 Test Method for Volatile Content of Coatings

D2371 Test Method for Pigment Content of Solvent-Reducible Paints (Withdrawn 2019)[3]

D3723 Test Method for Pigment Content of Water-Emulsion Paints by Low-Temperature Ashing

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

E1347 Test Method for Color and Color-Difference Measurement by Tristimulus Colorimetry

[1] This specification is under the jurisdiction of ASTM Committee C09 on Concrete and Concrete Aggregates and is the direct responsibility of Subcommittee C09.22 on Materials Applied to New Concrete Surfaces.

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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.

*A Summary of Changes section appears at the end of this standard

G154 Practice for Operating Fluorescent Ultraviolet (UV) Lamp Apparatus for Exposure of Nonmetallic Materials

2.2 *Other Standard:*

ANSI A136.1–1992 Type I Organic Adhesives for Installation of Ceramic Tile[4]

3. Terminology

3.1 For definitions of terms used in this specification, refer to Terminology C125.

4. Classification

4.1 The following types of liquid membrane-forming compounds are included:

4.1.1 *Type I*—Clear or translucent, and

4.1.2 *Type II*—White pigmented.

4.2 The curing compound shall conform to one of the following classes:

4.2.1 *Class A* curing compounds conform to the requirements of 7.4.1, and are essentially non-yellowing,

4.2.2 *Class B* curing compounds conform to the requirements of 7.4.2, where moderate yellowing is not prohibited, and

4.2.3 *Class C* curing compounds are not restricted with regard to yellowing or darkening, and are for use where the color changes are acceptable.

NOTE 2—Polymer materials known to satisfy the durability requirements of this document include, but are not limited to, chlorinated rubbers, styrene-acrylate and styrene-butadiene copolymers. These polymers have demonstrated their durability by their ability to adhere to concrete and not be affected by the alkalies from cement.

NOTE 3—Pigmented colors other than white, or other special attributes, are beyond the scope of this specification and are subject to negotiation between the purchaser and the supplier.

5. Ordering Information

5.1 The purchaser shall include the following information in the purchase order when applicable:

5.1.1 Type and class of liquid membrane-forming compound to be furnished,

5.1.2 Rate of application to be used to determine conformance to this specification,

5.1.2.1 For Type I compounds if not specified, the liquid membrane-forming material shall be applied by uniform spraying at a rate of 7.4 m^2/L (300 ft^2/gal) for testing purposes.

5.1.2.2 For Type II compounds, if not specified, the liquid membrane-forming material shall be applied by uniform spraying at a rate of 5.0 m^2/L (200 ft^2/gal) for testing purposes.

NOTE 4—The application rate used for testing may or may not be the same as the rate used for field application. Many agencies use the same rate for field application on relatively smooth surfaces as the rate used for testing, while requiring a substantially greater application rate on deeply textured surfaces.

5.1.3 The intended method of application (for example: spraying, brushing, or by roller). If not specified, materials shall be of a sprayable consistency.

6. General Requirements

6.1 Type I liquid membrane-forming compound shall be clear or translucent and have a minimum of 25 % solids by mass when tested in accordance with 9.5.

6.2 Type II liquid membrane-forming compound shall consist of finely divided white pigment and vehicle integrally ready mixed for immediate use as is and have a minimum of 25 % vehicle solids by mass when tested in accordance with 9.6. The membrane-forming compound shall present a uniform white appearance when applied uniformly to a new concrete surface at the specified rate of application.

NOTE 5—Although this is a performance specification, a minimum vehicle solids content is specified in order to provide an approximately 0.025 mm (1 mil) thick dry film at the specified rate of application. This film thickness is considered necessary to achieve the desired characteristics.

6.3 Liquid membrane-forming compounds shall be of such a consistency that they can be readily applied by spraying, or by brushing or rolling, to form a uniform coating at temperatures above 4 °C (40 °F).

NOTE 6—For uniform application in the field on vertical concrete surfaces, the specified rate of application may be achieved by two coats, each applied at one half the normal rate with approximately 1 h drying time between coats or in accordance with manufacturer's recommendations.

6.4 Liquid membrane-forming compounds shall adhere to freshly-placed concrete that has stiffened or set sufficiently to resist marring during application. Liquid membrane-forming compounds shall also adhere to damp or dry, hardened concrete surfaces. In every case, the compound shall form a continuous film after application at the specified rate.

6.5 Liquid membrane-forming compounds shall not react deleteriously with concrete. Deleterious reactions are detected by scratching the surface of a mortar specimen used for the water-retention test with a knife or screwdriver, not less than 72 h after application, and comparing with the surface hardness similarly determined on a similar specimen that has been moist cured for one half the time. Any softening of the treated surface shall be considered sufficient cause for rejection of the compound.

6.5.1 Testing for deleterious reactions is not needed on a routine basis. However, it must be done when testing compounds of a new or unknown composition.

6.6 Liquid membrane-forming compounds shall be storable for at least 6 months without deterioration. Compounds of the water emulsion type shall not be exposed to freezing. Type II liquid membrane-forming compounds shall be capable of being mixed to a uniform consistency by stirring or agitation. When tested for long term settling, as is stated in 9.4, the compound shall have a rating of not less than 4.

7. Specific Characteristics

7.1 *Water Loss*—Liquid membrane-forming compounds, when tested in accordance with 9.1 shall restrict the loss of water to not more than 0.40 kg/m^2 in 72 h.

7.2 *Reflectance*—Type II liquid membrane-forming compounds, when tested in accordance with 9.2 shall exhibit a

[4] American National Standard Specifications for the Installation of Ceramic Tile, 1992, Tile Council of America, P.O. Box 1787, Clemson, SC 29633-1787.