

SSPC: The Society for Protective Coatings

PAINT SPECIFICATION NO. 39

Two-Component Aliphatic Polyurea Topcoat Fast or Moderate Drying, Performance-Based

1. Scope

1.1 This specification contains performance requirements for a two-component, weatherable polyurea topcoat. The coating may be fast or moderately fast drying (see Note 12.1).

1.2 Coatings meeting the requirements of this specification are generally suitable for exposures in Environmental Zones 1A (interior, normally dry), 1B (exterior, normally dry), 2A (frequently wet by fresh water, excluding immersion), and 2B (frequently wet by salt water, excluding immersion). Resistance of polyurea topcoats in Environmental Zones 3B (chemical exposure, neutral) and 3C (chemical exposure, alkaline) can vary based upon formulation. The coating manufacturer should be contacted for specific chemical resistance data if required.

1.3 The specified coating is intended for application by single-component airless spray, electrostatic spray, or plural-component equipment, depending upon its formulation.

1.4 This coating is intended for use as a topcoat over suitably primed ferrous metal and cementitious substrates.

2. Description

2.1 The resins used in the coating shall result in a polyurea product as described in Notes 12.1.1 and 12.1.2 or a hybrid system as described in Note 12.2. This coating is comprised primarily of polyamine and polyisocyanate resins that react to form a polyurea.

2.2 COATING TYPE: The two types of polyurea coatings are differentiated by drying time.

2.2.1 Type 1 (Fast Drying): A Type 1 coating dries to handle in less than 30 minutes (per ASTM D 1640).

2.2.2 Type 2 (Moderate Drying): A Type 2 coating dries to handle from 30 minutes to 2 hours (per ASTM D 1640).

2.3 RESIN TYPES: A coating meeting the requirements of this specification shall be a hindered aliphatic polyurea, non-hindered aliphatic polyurea, or hybrid coating (see Notes 12.1 and 12.2).

2.4 WEATHERING LEVELS: This specification contains three levels of accelerated weathering (Levels 1A, 2A and 3A) and two levels of outdoor weathering performance (Levels 1N and 2N). Table 1 specifies the amount of time the coating must perform before noticeable color and gloss change in order to achieve the required performance level as defined in paragraphs 2.4.1 through 2.4.5 and Table 1. A certain level of accelerated weathering does not necessarily correspond to a particular level of atmospheric weathering. The specifier shall stipulate the requirements for outdoor weathering, accelerated weathering, or both. These are two independent, complementary tests for measuring coating performance. If no performance level and/or specific weathering test is specified, Level 3A for accelerated weathering (longest accelerated exposure) will be assumed.

2.4.1 Level 1A: Level 1A coatings have been evaluated for 500 hours in accelerated weathering testing.

2.4.2 Level 2A: Level 2A coatings have been evaluated for 1000 hours in accelerated weathering testing.

2.4.3 Level 3A: Level 3A coatings have been evaluated for 2000 hours in accelerated weathering testing.

2.4.4 Level 1N: Level 1N coatings have been evaluated for 12 months in natural exterior weathering testing.

2.4.5 Level 2N: Level 2N coatings have been evaluated for 24 months in natural exterior weathering testing.

Typical specular gloss levels are shown in Note 12.3.

Polyurea topcoats are available in a wide range of color and gloss. Procurement documents shall state the desired level of performance, exposure method, color, and gloss. For example, a specifier may require Level 2N outdoor exposure, initial gloss greater than 80, matched to a specific color.

2.5 This specification addresses performance properties of only white and pastel colored coatings. Because dark pigments are more sensitive to ultraviolet degradation, testing of individual coatings in deep tones and safety colors is necessary to establish their color and gloss retentive properties.

3. Referenced Standards

3.1 The latest issue, revision, or amendment of the referenced documents in effect on the date of invitation to bid shall govern unless otherwise specified. Those documents marked with an asterisk (*) are referenced only in the Notes or the Appendix, which are not requirements of this specification.

3.2 If there is a conflict between the requirements of any of the cited reference documents and this specification, the requirements of this specification shall prevail.

3.3 SSPC STANDARDS:

Guide 13	Guide for the Identification and Use of Industrial Coating Materials in Computerized Product Databases
PA 2	Measurement of Dry Film Thickness with Magnetic Gages

3.4 ASTM INTERNATIONAL STANDARDS:¹

D 523	Standard Test Method for Specular Gloss
D 562	Standard Test Method for Consistency of Paints Measuring Krebs Units (KU) Viscosity Using the Stormer-Type Viscometer
D 1014	Standard Practice for Conducting Exterior Exposure Tests of Paints on Steel
D 1296	Standard Test Method for Odor of Volatile Solvents and Diluent
D 1475	Standard Test Method for Density of Liquid Coatings, Inks, and Related Products
D 1535	Standard Practice for Specifying Color by the Munsell System
D 1640	Standard Test Methods for Drying, Curing, or Film Formation of Organic Coatings at Room Temperature
D 1849	Standard Test Method for Package Stability of Paint
D 2244	Standard Test Method for Calculation of Color Differences from Instrumentally Measured Color Coordinates
* D 2369	Standard Test Method for Volatile Content of Coatings
* D 2371	Standard Test Method for Pigment Content of Solvent-Reducible Paints
* D 2621	Standard Test Method for Infrared Identification of Vehicle Solids from Solvent-Reducible Paints
D 3925	Practice for Sampling Liquid Paints and Related Pigmented Coatings

D 4541	Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers
D 4587	Standard Practice for Fluorescent UV-Condensation Exposures of Paint and Related Coatings
D 5402	Standard Practice for Assessing the Solvent Resistance of Organic Coatings Using Solvent Rubs

3.5 AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI) STANDARD:²

Z129.1	Hazardous Industrial Chemicals – Precautionary Labeling
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3.6 FEDERAL SPECIFICATIONS AND STANDARDS:³

FED-STD-141:	Paint, Varnish, Lacquer and Related Materials: Methods of Inspection, Sampling and Testing ³
* Method 3011	Condition in Container
Method 4331	Spraying Properties

4. Composition

4.1 This is a performance-based coating specification, therefore the manufacturer is given wide latitude in the selection of materials and manufacturing processes (see Note 12.4).

4.2 RESIN REQUIREMENT: The reactive components used in the coating shall be comprised primarily of polyamine and polyisocyanate resins that react to form a polyurea (see Notes 12.1 and 12.2).

5. Standard Testing Conditions

5.1 TEST PANELS [each test specifies the number of replicates]: Panel size shall be 75 x 150 x 5 mm (3 x 6 x 3/16 inches) or greater. All test panels shall be coated with the primer recommended by the topcoat manufacturer. Follow the primer manufacturer's instructions for surface preparation, application, and cure of the primer.

5.2 APPLICATION: In accordance with the manufacturer's written recommendations, the topcoat shall be spray-applied in a single coat or multiple coats.

5.3 DRY FILM THICKNESS: The minimum dry film thickness (DFT) of the test panels shall be the manufacturer's written recommended minimum thickness. If there is no recommended film thickness, then the minimum DFT shall be 150

¹ ASTM, 100 Barr Harbor Road, West Conshohocken PA, 19248, (<http://www.astm.org>).

² ANSI, 1819 L Street, NW, Washington, DC 20036, (<http://www.ansi.org>).

³ FED-STD 141 may be obtained from <http://assist.daps.dla.mil>.