

SSPC: The Society for Protective Coatings

Coating 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) will 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 brush, spray roller, or plural-component equipment, depending upon its formulation. It is generally applied over a primer or intermediate coat.

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

2. Description

2.1 The resins used in the coating result in a polyurea product as described in Note 12.1 or a hybrid system as described in Note 12.2.

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 two hours (per ASTM D 1640).

3. Referenced Standards

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

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

3.3 SSPC STANDARDS

SSPC-Guide 13 Guide for the Identification and Use of Industrial Coating Materials in Computerized Product Databases

SSPC-PA 15 Material and Preparation Requirements for Steel Test Panels Used to Evaluate the Performance of Industrial Coatings

3.4 ASTM International Standards¹

D523	Standard Test Method for Specular Gloss
* D562	Standard Test Method for Consistency of Paints Measuring Krebs Units (KU) Viscosity Using the Stormer-Type Viscometer
D1014	Standard Practice for Conducting Exterior Exposure Tests of Paints and Coatings on Metal Substrates
* D1296	Standard Test Method for Odor of Volatile Solvents and Diluent
* D1475	Standard Test Method for Density of Liquid Coatings, Inks, and Related Products
* D1535	Standard Practice for Specifying Color by the Munsell System
D1640	Standard Test Methods for Drying, Curing, or Film Formation of Organic Coatings at Room Temperature
D1849	Standard Test Method for Package Stability of Paint
D2244	Standard Test Method for Calculation of Color Differences from Instrumentally Measured Color Coordinates
* D2369	Standard test Method for Volatile Content of Coatings
* D2371	Standard Test Method for Pigment Content of Solvent-Reducible Paints

¹ ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959. 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 online information, refer to the standard's Document Summary Page on the ASTM Website.

* D2621	Standard Test Method for Infrared Identification of Vehicle Solids from Solvent-Reducible Paints
D2794	Standard Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact)*
D3925	Practice for Sampling Liquid Paints and Related Pigmented Coatings
D4541	Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers
D4587	Standard Practice for Fluorescent UV-Condensation Exposures of Paint and Related Coatings
D5402	Standard Practice for Assessing the Solvent Resistance of Organic Coatings Using Solvent Rubs

3.6 UNITED NATIONS STANDARD²

GHS	Globally Harmonized System of Classification and Labelling of Chemicals (GHS), 4th Revised Edition.
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4. Composition Requirements

4.1 RESIN REQUIREMENT: The reactive components used in two-component polyurea topcoats are comprised primarily of polyamine and polyisocyanate resins (see Note 12.1, and 12.2).

4.2 VOC CONTENT: This coating shall comply with all applicable federal, state, and local VOC regulations (see Note 12.3).

4.3 ANALYTICAL TEST DATA: If required, the coating manufacturer shall provide certificates of analysis for coating batches qualified by independent testing to meet this standard for use in verifying batch-to-batch consistency of material (see Note 12.4 and subsections).

5. Requirements of Liquid Coating

5.1 PACKAGE STABILITY: Package stability shall be tested in accordance with ASTM D1849. Storage conditions shall be 30 days at 52 ± 1 degrees C (126 ± 2 degrees F). A change in consistency of greater than 10 Krebs Units or noncompliance with the viscosity requirements stated on the manufacturer's product data sheet shall be cause for rejection.

5.2 APPLICATION PROPERTIES: All guidance provided by the manufacturer regarding mixing of multi-component products, thinning requirements, induction times, and special application requirements shall be followed. The coatings shall

be applied by single-component airless spray, electrostatic spray, plural-component equipment, conventional spray equipment such as HVLP, or brush and roller (depending on their formulation and application characteristics) in accordance with the instructions on the applicable product data sheet. The coating shall show no streaking, running, sagging or other defects during application or while drying.

6. Test Panel Preparation

Triplicate test panels shall be prepared in accordance with SSPC-PA 15.

7. Weathering Requirements

7.1 WEATHERING RESISTANCE: Two weathering test procedures are specified below. Performance levels are established using whites and light colored coatings.³ Either Accelerated Weathering (Section 7.1.1) or Natural Outdoor Weathering (Section 7.1.2) will fulfill the requirements of this standard.

7.1.1 Accelerated Weathering (A): Accelerated weathering shall be performed in accordance with ASTM D 4587 Cycle 2. This eight-hour duration comprises one test cycle. Continue cycle testing to achieve the exposure hours defined by the specified Performance Level shown in Table 1.

7.1.1.1 Level 1A: Products conforming to this performance level shall have a maximum gloss reduction of 20 percent and maximum color change of $2.0 \Delta E^*$ when measured in accordance with ASTM D2244 after a 500-hour exposure (see Note 12.5 and subsections).

7.1.1.2 Level 2A: Products conforming to this performance level shall have a maximum gloss reduction of 30 percent and maximum color change of $3.0 \Delta E^*$ when measured in accordance with ASTM D2244 after a 1000-hour exposure.

7.1.1.3 Level 3A: Products conforming to this performance level shall have a maximum gloss change of 40 percent and a maximum color change of $3.0 \Delta E^*$ when measured in accordance with ASTM D2244 after a 2000-hour exposure.

7.1.2 Natural Outdoor Weathering (N): Outdoor weathering shall be performed in accordance with ASTM D1014 (45 degrees south exposure, washed with mild detergent before readings are taken). If required by the coating manufacturer, test panels shall have a primer and intermediate coat.

Test sites—Unless otherwise specified, the natural outdoor weathering test sites shall have a daily average total ultraviolet radiation of 1.0 ± 0.1 megaJoules per square meter [mJ/m^2]. Sixty-degree gloss shall be measured according to ASTM D523 and tristimulus color measured according to ASTM D2244 both initially and at the end of each level period. The coating shall

² United Nations Economic Commission for Europe, Transport Division, Palais des Nations, CH - 1211 Geneva 10, Switzerland. Copies of this standard may be obtained from the United Nations Publications Customer Service, National Book Network, 15200, 15200 NBN Way, Ridge Summit PA 17124 < <https://unp.un.org> >

³ For the purpose of this standard, colors having a value of 9 or above on the Munsell color chart are considered "light colors."