

SSPC: The Society for Protective Coatings

COATING STANDARD NO. 41

Moisture-Cured Polyurethane Primer or Intermediate Coat, Micaceous Iron Oxide Reinforced, Performance-Based

1. Scope

This standard contains requirements and acceptance criteria for laboratory evaluation of the performance of moisture-cured aromatic polyurethane coatings having thermoset binders and micaceous iron oxide pigment reinforcement. The coating may be applied either directly to a steel substrate, or over itself or a compatible primer such as SSPC-Paint 40 or other primers recommended by the coating manufacturer.

2. Description

2.1 Coatings meeting requirements of this standard are single-package moisture-cured polyurethane coatings characterized by the presence of free isocyanate groups capable of reacting with atmospheric moisture to form a solid film.

2.2 Coatings meeting the requirements of this standard are generally suitable for exposures in SSPC environmental zones 1A (interior, normally dry), 1B (exterior, normally dry), 2A (frequently wet by fresh water excluding immersion), 2B (frequently wet by salt water, excluding immersion), 3B (chemical exposure, neutral) and 3C (chemical exposure, alkaline). Primer/intermediate coat systems described in this standard meet the performance requirements of Section 7.4 of SSPC-Paint 40 (including Environmental Zone 2C Fresh Water Immersion).

2.3 Moisture-cured polyurethane coatings are typically applied by spray, but may be applied by brushing or rolling if recommended by the manufacturer.

2.4 UNITS OF MEASURE: This standard makes use of both the ASTM SI 10, "American National Standard for Metric Practice" International System Units (SI) and U.S. Customary units. The measurements are not exact equivalents; therefore, each system must be used independently of the other.

3. Referenced Standards

3.1 The date of the referenced standard in effect at the time of publication of this standard 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 standard.

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

3.3 SSPC STANDARDS:

PA 2	Measurement of Dry Coating Thickness with Magnetic Gages
PA 15	Material and Preparation Requirements for Steel Test Panels Used to Evaluate the Performance of Industrial Coatings
PA 16	Method for Evaluating Scribe Undercutting on Coated Steel Test Panels Following Corrosion Testing
Paint 40	Zinc-Rich Moisture-Cured Polyurethane Primer, Performance-Based

3.4 AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO) STANDARD:⁽¹⁾

- * T 339-10 Standard Method of Test for Analysis of Structural Steel Coatings for Isocyanate Content

3.5 ASTM INTERNATIONAL STANDARDS:⁽²⁾

- * D523 Standard Test Method for Specular Gloss
- * D562 Standard Test Method for Consistency of Paints Measuring Krebs Unit (KU) Viscosity Using a Stormer-Type Viscometer
- D714 Standard Test Method for Evaluating Degree of Blistering of Paints
- * D1296 Standard Test Method for Odor of Volatile Solvents and Diluents
- * D1475 Standard Test Method for Density of Liquid Coatings, Inks, and Related Product

⁽¹⁾ American Association of State Highway and Transportation Officials (AASHTO), 444 North Capitol Street, NW Suite 249, Washington, DC 20001, phone 202-624-5800. Standards available online from <<https://bookstore.transportation.org/>>

⁽²⁾ ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959. Standards available online from <http://www.astm.org>.

- * 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
- D1654 Standard Test Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments
- * D2244 Standard Practice for Calculation of Color Tolerances and 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
- * 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)
- * D3359 Standard Test Methods for Rating Adhesion by Tape Test
- D4541 Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers
- D5894 Standard Practice for Cyclic Salt Fog/UV Exposure of Painted Metal, (Alternating Exposures in a Fog/Dry Cabinet and a UV/Condensation Cabinet)
- * D6677 Standard Test Method for Evaluating Adhesion by Knife
- SI 10 American National Standard for Metric Practice

3.6 UNITED NATIONS STANDARD:⁽³⁾

GHS Globally Harmonized Standard of Classification and Labelling of Chemicals

4. Composition Requirements

4.1 VOC CONTENT: Coatings meeting requirements of this standard shall comply with all applicable federal, state, and local VOC regulations (see Note 12.1).

⁽³⁾ 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/Details.aspx?pid=23481>>

4.2 PIGMENT REQUIREMENT

4.2.1 Micaceous iron oxide is a required pigment component in these coatings (see Note 12.2 for typical formulation percentage ranges). The manufacturer shall provide information on the micaceous iron oxide content if requested.

4.2.2 Optional pigment components include extenders, tinting colors and suspension control agents.

4.3 RESIN REQUIREMENT: The resin used in the coating shall be a polyisocyanate-based product that cures through a chemical reaction with atmospheric moisture. Use of other resins or modifiers shall be limited to products necessary for formula ingredient compatibility and to improve recoating properties. See Note 12.3 for information on modifying resins.

4.4 ANALYTICAL TEST DATA: If mutually agreed upon by purchaser and supplier, the coating manufacturer shall provide certificates of analysis for coating batches qualified by independent testing to meet this standard, including petrographic analysis of the percentage of lamellar particles present in the micaceous iron oxide pigment.

5. Test Panel Preparation

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

6. Requirements of Liquid Coating

6.1 PACKAGE STABILITY: Package stability shall be tested in accordance with ASTM D1849. Storage conditions shall be 30 days at 52 ± 1 °C (125 ± 2 °F). A change in consistency of greater than 10 Krebs Units or noncompliance with the viscosity requirements stated on the manufacturer's product sheet shall be cause for rejection.

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

7. Laboratory Tests of Applied Coatings

7.1 RECOATABILITY: If applicable, substrate and inter-coat adhesion properties of the applied coatings shall be



Documents

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