

SSPC: The Society for Protective Coatings

PAINT SPECIFICATION NO. 41

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

1. Scope

This specification contains performance requirements for a moisture-cured aromatic polyurethane coating with a thermoset binder and micaceous iron oxide pigment reinforcement.

2. Description

2.1 This coating is a single-package moisture-cured polyurethane coating characterized by the presence of free isocyanate groups capable of reacting with atmospheric moisture in order to form a solid film.

2.2 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), 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 This coating is intended for spray application according to manufacturer's instructions, with allowance for small area touch-up by brush (see Note 11.1) 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.

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 AND JOINT STANDARDS:

Guide 13	Guide for the Identification and Use of Industrial Coating Materials in Computerized Product Databases
PA 2	Measurement of Dry Coating Thickness with Magnetic Gages
Paint 40	Zinc-Rich Moisture Cure Polyurethane Primer, Performance Based
SP 1	Solvent Cleaning
SP 5/NACE No. 1	White Metal Blast Cleaning

3.4 ASTM INTERNATIONAL STANDARDS:¹

D 185	Standard Test Methods for Coarse Particles in Pigments
* D 562	Standard Test Method for Consistency of Paints Measuring Krebs Unit (KU) Viscosity Using a Stormer-Type Viscometer
D 714	Standard Test Method for Evaluating Degree of Blistering of Paints
* D 1475	Standard Test Method for Density of Liquid Coatings, Inks, and Related Products
D 1640	Standard Test Methods for Drying, Curing, or Film Formation of Organic Coatings at Room Temperature
D 1654	Standard Test Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments
* D 2369	Standard Test Method for Volatile Content of Coatings
* D 2371	Standard Test Method for Pigment Content of Solvent-Reducible Paints
D 2794	Standard Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact)
D 4417	Standard Test Methods for Field Measurement of Surface Profile of Blast Cleaned Steel
D 4541	Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers

¹ ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959. Standards available online from <http://www.astm.org>.

- D 5894 Standard Practice for Cyclic Salt Fog/UV Exposure of Painted Metal, (Alternating Exposures in a Fog/Dry Cabinet and a UV/Condensation Cabinet)

3.5 AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI) STANDARD:²

ANSI Z129.1 Hazardous Industrial Chemicals—Precautionary Labeling

4. Composition Requirements

4.1 The manufacturer is given wide latitude in the selection of materials and manufacturing processes.

4.2 Pigment Requirement

4.2.1 Micaceous iron oxide is a required pigment component in this coating (see Note 11.2 for typical formulation percentage ranges). The manufacturer shall provide information on the micaceous iron oxide content on the product data sheet, or as required by the purchaser.

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 11.3 for information on VOC content, and Note 11.4 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. Standard Testing Conditions

5.1 TEST PANELS: The hot rolled steel test panels shall conform to ASTM A 572. Panel size shall be 100 mm x 150 mm x 3.2 mm (4 inch x 6 inch x 1/8 inch). Test panels shall be solvent cleaned in accordance with SSPC-SP 1 prior to blast cleaning. The test panels shall be blast cleaned in accordance with SSPC-SP 5. The blast profile shall be 44 to 57 micrometers (1.75 to 2.25 mils) as measured in accordance with ASTM D 4417, Method C.

5.2 APPLICATION: The coating shall be spray applied as a single coat in accordance with recommendations on the manufacturer's product data sheet. The coating shall show no streaking, running, sagging, or other defects during application or while drying.

5.3 DRY FILM THICKNESS: The dry film thickness (DFT) on the test panels shall meet the manufacturer's written recommended range. The DFT shall be measured in accordance with SSPC-PA 2, Appendix 5.

5.4 CURE: The primer shall be dried and cured in accordance with manufacturer's written recommendations. Before any testing, all coated panels shall be aged for a minimum of 7 days in an environment with a minimum relative humidity of 50%, and at a temperature of 23 ± 2 °C (73.5 ± 3.5 °F), as described in paragraph 5.1 of ASTM D 1640.

5.5 SCRIBING: Scribe two parallel lines on the face of the coated panels so as to expose the underlying metal before testing. The lines shall be at least 2.5 cm (1 inch) from the edge, the top, and the bottom of each panel and at least 5 cm (2 inches) from each other. Each scribe shall be 6 cm (2.4 inches) long. The scribes may run vertically or at an angle across the face of the panel. Follow the scribe-making procedure described in ASTM D 1654.

5.6 BACKS AND EDGES: Coat and seal all edges and the back side of each panel with a coating or tape that will provide the necessary protection to these surfaces.

6. Requirements of Liquid Coating

6.1 MIXING: The coating shall be mixed and dispersed to produce a product that is uniform, stable, free from grit, and in conformance with the requirements of this specification

6.1.1 The single-component coating shall be capable of being dispersed under mechanical agitation to a smooth, uniform consistency and shall not show any objectionable properties in the mix.

6.1.2 After mixing and filtering through a standard 60 mesh screen in accordance with ASTM D 185, the amount of coarse particles and skins retained shall not exceed 0.5% by weight (see Note 11.5).

6.2 STORAGE LIFE: The coating shall exhibit no curdling, gelling, gassing, or hard caking after being stored unmixed for a minimum of six months from date of delivery in a tightly sealed, unopened container at a temperature of 10 to 32 °C (50 to 90 °F).

6.3 WORKING PROPERTIES: The mixed coating shall spray easily and show no signs of streaking, running, sagging, or other objectionable features when applied according to

² American National Standards Institute, 1819 L Street, NW, Suite 600, Washington, DC 20036. Standards available online from www.ansi.org.