

SSPC: The Society for Protective Coatings

COATING STANDARD NO. 40

Zinc-Rich Moisture-Cure Polyurethane Primer, Performance-Based

1. Scope

1.1 This standard contains performance requirements for an organic zinc-rich moisture-cure polyurethane primer with a thermoset binder. SSPC-PS 12.00 describes this primer as a Type II B zinc-rich primer.

2. Description

2.1 This zinc-rich moisture-cure polyurethane primer is characterized by the presence of free polyisocyanate groups capable of reacting with atmospheric moisture to form a film. Either single or two-component packaging is acceptable. Zinc loading requirements are given in Section 4.2.1. Appendix A provides additional information for slip-critical applications.

2.2 This primer is available in two Types. Type I formulations, applied over properly prepared carbon steel surfaces, are suitable for use on parts or structures exposed in Environmental Zones 1A – interior, normally dry; 1B – exterior, normally dry; 2A – frequently wet by fresh water; 2B – frequently wet by salt water, excluding immersion, and 3B – chemical exposure, neutral (with suitable topcoat). Type II formulations, applied over properly prepared carbon steel surfaces, are suitable for exposure in Environmental Zone 2C – fresh water (continuous) immersion. Type II primers meet the requirements of Section 8.2 for fresh water immersion in addition to the requirements for Type I.

2.3 Primers described by this standard provide corrosion resistance and accept application of suitable topcoats. Unless a Type I primer is specified, the primer described by this standard is intended to comply with Type II requirements.

2.4 This primer is intended for application by spray directly to a steel substrate, with the allowance for small area touch-up by brush (see Note 12.1)

2.5 Units of Measure: This standard makes use of both the ASTM⁽¹⁾ SI 10, “American National Standard for Metric Practice” International System Units (SI) units and U.S. Customary units. The measurements are not exact equivalents; therefore each system must be used independently of the other without combining in any way. This

standard uses U.S. Customary units with the approximate SI conversions shown in parentheses.

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 Scope, Notes or 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 standard, the requirements of this standard shall prevail.

3.3 SSPC STANDARDS AND JOINT STANDARDS:

*	SSPC-PS 12.00	Guide to Zinc-Rich Coatings
	SSPC-PA 15	Material and Preparation Requirements for Steel Test Panels Used to Evaluate the Performance of Industrial Coatings
	SSPC-PA 16	Method for Evaluating Scribe Undercutting on Coated Steel Test Panels Following Corrosion Testing
	SSPC-VIS 2	Standard Method of Evaluating Degree of Rusting on Painted Steel Surfaces

3.4 ASTM INTERNATIONAL STANDARDS

	D520	Standard Specification for Zinc Dust Pigment
*	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
*	D1475	Standard Test Method for Density of Liquid Coatings, Inks, and Related Products
*	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
*	D2369	Standard Test Method for Volatile Content of Coatings

⁽¹⁾ ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959. Standards are available online at <<https://www.astm.org>>

This standard, developed by the SSPC C.1.3.D Polyurethane Coatings Committee, was issued in 2007 and revised in 2019.

* 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)
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)
D6580	Standard Test Method for the Determination of Metallic Zinc Content in Both Zinc Dust Pigment and in Cured Films of Zinc-Rich Coatings

3.5 3.5 U. S. CODE OF FEDERAL REGULATIONS

29 CFR 1910.1200, Hazard Communication⁽²⁾

3.6 AMERICAN ASSOCIATION OF HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO) SPECIFICATION⁽³⁾

- * Standard Specifications for Highway Bridges—Method to Determine the Slip Coefficient for Coatings used in Bolted Joints, Division 1, Section 10.32.3.2.3, Appendix A)

4. Composition Requirements

4.1 VOC CONTENT: This coating shall comply with all applicable federal, state, and local VOC regulations (see Note 12.2).

4.2 PIGMENT REQUIREMENT

4.2.1 The major pigment component in this coating is zinc dust meeting the requirements of ASTM D520, Type II or Type III. The paint shall contain a minimum of 65% zinc dust pigment by weight in the dry film per ASTM D6580 (see Note 12.3).

4.2.2 Optional pigment components include extenders, curing aids, tinting colors, and suspension and pot life 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 12.4 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. This information enables the customer to verify compliance to this standard (i.e., batch-to-batch consistency).

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: Neither the vehicle of the multi-component coating nor the ready-mixed primer shall show thickening that is detrimental to performance or application properties. Package stability shall be tested in accordance with ASTM D1849. Storage conditions shall be 30 days at 125 ± 2 °F (52 ± 1 °C). 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.

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 on 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 (see Note 12.1).

7. Physical Laboratory Testing of Applied Coatings

7.1 PRIMER ADHESION TO SUBSTRATE: Apply the primer to steel panels and cure according to manufacturer's recommendations. Adhesion shall be tested according to ASTM D4541, Method C, D, or E. Report the type of adhesion tester employed, and the type of adhesive used for testing. Perform three pulls on each of three test panels. Unless a higher value is specified, the minimum adhesion value of the primer to the substrate for each pull shall be 600 psi (4.14 MPa). The instrument used to obtain adhesion measurements to ensure batch-to-batch compliance with requirements of this standard (see Section 4.4) shall be of the same type used to perform the initial compliance testing. Refer to Note 12.5 for additional information regarding adhesion of subsequently applied coatings

⁽²⁾ U.S. Code of Federal Regulations is available online at <<https://gov.ecfr.io/cgi-bin/ECFR?page=browse>>

⁽³⁾ 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/>>