

SSPC: The Society for Protective Coatings

PAINT SPECIFICATION NO. 22

Epoxy Polyamide Paints (Primer, Intermediate, and Topcoat)

1. Scope

1.1 This specification covers three types of two-component epoxy polyamide coatings—primer, intermediate, and topcoat—for use on steel surfaces. The information described herein shall be used as a control for evaluation of proposed coating systems. See SSPC-PS 13.01, “Epoxy Polyamide Painting System,” for specifications covering system requirements, including surface preparation, application, and thickness.

1.2 These coatings, when applied over properly prepared steel surfaces, are suitable for exposures in environmental zones 2A (frequently wet by fresh water), 2B (frequently wet by salt water), 3A (chemical, acidic), 3B (chemical, neutral), 3C (chemical, alkaline), 3D (chemical, solvents); but not for potable water tanks. They are intended for brush or spray application over steel prepared in accordance with SSPC-SP 6, “Commercial Blast Cleaning,” or SSPC-SP 8, “Pickling.” The performance will be improved by a better degree of surface preparation. They are suitable for shop, field, or maintenance coatings and are to be applied in accordance with SSPC-PA 1, “Shop, Field, and Maintenance Painting of Steel.” If the primed part of the structure is to be exposed to the weather, it should be topcoated as soon as practical.

2. Description

2.1 The coatings supplied under this specification are two-part products composed of a base component and a curing agent component. When the two components are mixed in the proper proportions the coatings are capable of curing at temperatures as low as 50°F (10°C) and fully curing in seven days.

2.2 The primer contains approximately 65% by volume of nonvolatile film-forming solids (pigment and binder). The theoretical spreading rate for a 2.5 mil (63 micrometers) dry film thickness is 420 square feet/U.S. gallon (10.2 square meters/liter).

2.3 The intermediate contains approximately 65% by volume of nonvolatile film-forming solids (pigment and binder). The theoretical spreading rate for a 2.5 mil (64 micrometers) dry film thickness is 420 square feet/U.S. gallon (10.2 square meters/liter).

2.4 The topcoat contains approximately 60% by volume of nonvolatile film-forming solids (pigment and binder). The theoretical spreading rate for 2.5 mil (63 micrometers) dry film thickness is 380 square feet/U.S. gallon (9.5 square meters/liter).

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.

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 AND JOINT STANDARDS:

SSPC Guide 13	Guide for the Identification and Use of Industrial Coating Material in Computerized Product Databases
PA 1	Shop, Field, and Maintenance Painting of Steel
PA 2	Measurement of Dry Coating Thickness With Magnetic Gages
SP 6/NACE No. 3	Commercial Blast Cleaning
SP 8	Pickling
SP 10/NACE No. 2	Near-White Blast Cleaning
PS 13.01	Epoxy Polyamide Painting System Guide and Reference Photographs for Evaluating Degree of Rusting on Painted Steel Surfaces
VIS 2	

3.4 ASTM INTERNATIONAL STANDARDS:

B 117	Method of Salt Spray (Fog) Testing
D 209	Specification for Lampblack Pigment
D 263	Specification for Chrome Oxide Green Pigment
D 331	(Withdrawn) Specification for 2-Ethoxyethyl Acetate (95% Grade)
D 476	Classification for Dry Pigmentary Titanium Dioxide Products
D 522	Test Methods for Mandrel Bend Test of Attached Organic Coatings

- D 562** Test Method for Consistency of Paints Measuring Krebs Unit (KU) Viscosity Using a Stormer-type Viscometer
- D 605** Specification for Magnesium Silicate Pigment (Talc)
- D 607** Specification for Wet Ground Mica Pigments
- D 610** Test Method for Evaluating Degree of Rusting on Painted Steel Surfaces
- D 714** Test Method for Evaluating Degree of Blistering of Paints
- D 1153** Specification for Methyl Isobutyl Ketone
- D 1210** Test Methods for Fineness of Dispersion of Pigment-Vehicle Systems by Hegman-type Gage
- D 1310** Test Method for Flash Point and Fire Point of Liquids by Tag Open-Cup Apparatus
- D 1475** Test Method for Density of Liquid Coatings, Inks, and Related Products
- D 1544** Test Method for Color of Transparent Liquids by Bubble Time Method
- D 1640** Test Methods for Drying, Curing, or Film Formation of Organic Coatings at Room Temperature
- D 1652** Test Methods for Epoxy Content of Epoxy Resins
- D 1654** Test Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments
- D 2369** Test Method for Volatile Content of Coatings
- D 3722** Specification for Natural Red and Brown Iron Oxide Pigments

3.5 AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI) STANDARD:

- Z129.1** Hazardous Industrial Chemicals – Precautionary Labeling

4. Composition

4.1 Ingredients and proportions of the reference formulations shall be as specified in Table 1.

4.2 Each component of these paints based on the specified ingredients shall be uniform, stable in storage, and free from grit and coarse particles.

4.3 The base component of each coating shall contain an epoxy resin together with anti-corrosion pigments, color pigments, mineral fillers, gellant, leveling agent, and volatile solvents. The epoxy resin shall be a di-epoxide condensation product of biphenol A and epichlorohydrin with terminal epoxide group.

4.4 The curing agent component of each coating shall contain a liquid type polyamide resin and volatile solvent. The

polyamide resin shall be a condensation product of dimerized fatty acids and polyamines.

4.5 Each coating shall conform to the composition (analysis) requirements of Table 2.

5. Properties

5.1 The epoxy resin shall meet the requirements of Table 3.

5.2 The undiluted polyamide resin shall meet the requirements of Table 4.

5.3 Coatings supplied under this specification shall be comparable in performance to the reference formulations of Table 1. They need not be composed of the quantities and types of ingredients given in Table 1. However, if substitutions of other ingredients are made, the coatings shall meet the performance requirements of this specification; and, when incorporated into a painting system, the performance requirements of SSPC-PS 13.01, "Epoxy Polyamide Painting System."

5.4 After combining the base and curing agent components, the primer, intermediate, and topcoat shall conform to the requirements of Table 5 and Sections 5.5 through 5.9.

5.5 POT LIFE: Determine pot life of the individual coatings as follows. Thoroughly mix a one-pint sample of the finished coating and let stand at $77 \pm 3^\circ\text{F}$ ($25 \pm 2^\circ\text{C}$) for eight hours. At the end of this time there shall be no evidence of gelation. The coatings shall be in a free-flowing condition and brushable without thinning. NOTE: When mixing larger volumes, more heat will develop with a resultant shortening of the pot life.

5.6 SOLVENT RESISTANCE: The development of solvent (methyl ethyl ketone) resistance is required as an indication of satisfactory cure and subsequent chemical resistance. Apply the individual coating (primer, intermediate, topcoat) by spray or brush to a clean test panel so that a dry film thickness of two to three mils (51 - 76 micrometers) per coat is obtained. Air dry the panel for five days at $77 \pm 3^\circ\text{F}$ ($25 \pm 2^\circ\text{C}$) and relative humidity of 40%- 50%. Following the curing period, saturate a small cottonball with methyl ethyl ketone and place on the test panel under a watch glass for 30 minutes. After a ten-minute recovery period, determine the pencil hardness of the coating. The minimum allowable rating is "7B."

Determine pencil hardness as follows: Using a series of drawing leads (either wood clinched or secured in a mechanical holder), expose approximately 1/4 inch (6 mm) of lead. With a rotary motion square the point of the lead against No. 400 grit paper. Hold the lead at approximately 45° and push forward against the film using a pressure just short of breaking the lead. If penetration is not made, repeat using the next harder lead until penetration is made. Rate the film by indicating the hardest lead that does not penetrate.