

SSPC: The Society for Protective Coatings

PAINT SPECIFICATION NO. 23

Latex Primer for Steel Surfaces

1. Scope

1.1 This specification covers an air drying, ready-mixed, water-borne primer for blast cleaned steel. It is intended for use as a primer coat of a water-borne coating system consisting of two coats of this primer and one or two coats of a water-borne topcoat.

1.2 This primer is suitable for exposures in Environmental Zones 1A (interior, normally dry) and 1B (exterior, normally dry), and is intended for brush, spray, or roller application over steel surfaces prepared in accordance with SSPC-SP 6, "Commercial Blast Cleaning." It is suitable as a shop primer, field primer, maintenance primer, or intermediate coat and is to be applied in accordance with SSPC-PA 1, "Shop, Field, and Maintenance Painting of Steel." It is not recommended to expose steel to the weather with less than two coats of water-borne coating; therefore, intermediate and topcoats should be applied as soon as possible.

2. Description

2.1 This primer is based on a latex vehicle produced by emulsion polymerization and appropriate pigments. Details of the composition are given in Table 1.

2.2 This primer contains approximately 36% by volume of nonvolatile film-forming solids (pigment and binder). The theoretical spreading rate for a 2.0 mil (51 micrometers) dry film thickness is 290 square feet/U.S. gallon (7.1 square meters/liter). Actual spreading rates can be significantly lower.

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

Paint 24

Latex Semigloss Exterior Top-coat

SP 6/NACE No. 3

Commercial Blast Cleaning

VIS 2

Guide and Reference Photographs for Evaluating the Degree of Rusting on Steel Surfaces

3.4 ASTM INTERNATIONAL STANDARDS:

B 117 Method of Salt Spray (Fog) Testing
D 522 Test Methods for Mandrel Bend Test of Attached Organic Coatings
D 523 Test Method for Specular Gloss
D 562 Test Method for Consistency of Paints Measuring Krebs Unit (KU) Viscosity Using a Stormer-type Viscometer
D 609 Practice for Preparation of Cold-Rolled Steel Panels for Testing Paint, Varnish, Conversion Coatings, and Related Coating Products
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 1210 Test Methods for Fineness of Dispersion of Pigment-Vehicle Systems by Hegman-type Gage
D 1296 Test Method for Odor of Volatile Solvents and Diluents
D 1640 Test Methods for Drying, Curing, or Film Formation of Organic Coatings at Room Temperature
D 1654 Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments
D 1737 (Canceled) Elongation of Attached Organic Coatings with Cylindrical Mandrel Apparatus (Replaced with ASTM D522)
D 1849 Test Method for Package Stability of Paint
D 2243 Test Method for Freeze-Thaw Resistance of Water-Borne Coatings
D 2247 Practice for Testing Water Resistance of Coatings in 100% Relative Humidity
D 2486 Test Method for Scrub Resistance of Wall Paints
D 2574 Test Method for Resistance of Emulsion Paints in the Container to Attack by Micro-organisms

- D 2801** (Withdrawn) Test Method for Leveling Characteristics of Paints by Draw-Down Method (See ASTM D 4400.)
- D 3273** Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber
- D 3274** Test Method for Evaluating Degree of Surface Disfigurement of Paint Films by Microbial (Fungal or Algal) Growth or Soil and Dirt Accumulation
- D 3891** Standard Practice for Preparation of Glass Panels for Testing Paint, Varnish, Lacquer, and Related Products
- D 3925** Practice for Sampling Liquid Paints and Related Pigmented Coatings
- D 4400** Test Method for Sag Resistance of Paints Using a Multinotch Applicator

3.5 FEDERAL STANDARDS:

TT-E-506 Enamel, Alkyd, Gloss, Tints and White (for Interior Use)

FED-STD-141 Paint, Varnish, Lacquer and Related Materials: Methods of Inspection, Sampling and Testing

Method 2021 (Canceled) Preparation of Glass Panels (Use ASTM D 3891)

Method 6141.1 (Canceled) Washability

3.6 AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI) STANDARD:

Z129.1 Hazardous Industrial Chemicals—Precautionary Labeling

4. Composition

4.1 The manufacturer is given some latitude in the selection of materials and process of manufacture, provided that the primer meets the requirements of this specification. Materials shall be of the best quality used in good commercial practice and entirely suitable for the purpose intended under normal conditions of use.

4.2 The vehicle shall be a stable dispersion of synthetic resin particles (latex) in water prepared by emulsion polymerization, together with the necessary additives such as pigment dispersant, antifoamer, preservatives, and "antifreeze" in order to produce a primer conforming to this specification. A suitable film and package preservative shall be used.

4.3 The paint shall conform to the composition (analysis) requirements of Table 1.

5. Properties

5.1 The paint shall meet the requirements of Table 2 and Sections 5.2 through 5.17.

5.2 ODOR: Shall be normal for the materials permitted (ASTM D 1296). In a freshly opened container, there shall be no offensive, disagreeable, or putrid odor.

5.3 COLOR: The color shall be as specified in the procurement documents.

5.4 RESISTANCE TO MICROORGANISM ATTACK: The paint shall be resistant to attack by microorganisms when tested according to ASTM D 2574.

5.5 APPLICATION PROPERTIES: The paint shall be easily applied to a smooth steel vertical surface at 4 mils (102 micrometers) wet film thickness on 400 square feet/gallon (9.8 square meters/liter) by brush, spray, or roller. Drying shall be done in a well-ventilated room or chamber free from drafts and dust in diffused light, not in direct sunlight. The temperature of the air shall be between 21 and 28°C. The relative humidity shall be 50% ± 5%. There shall be no runs, sags, streaks, flashes, laps, pinholing, eyeing, or cratering. After four hours of drying, apply a second coat in the same manner as the first. There shall be no picking-up or rolling-up of the first coat during applications. After 24 hours, the film shall be smooth and uniform.

5.6 CONDITION IN CONTAINER: The primer as received shall show no evidence of livering, skinning, or hard settling of the pigment. The inside of the container shall not be corroded. The material shall be easily dispersed in the liquid portion by hand stirring to form a smooth homogeneous paint. The primer shall show a minimum of foaming and be free of grit, seeds, lumps, or livering.

5.7 FREEZE-THAW RESISTANCE: The paint shall pass three cycles when tested according to the procedure described in ASTM D 2243. There shall be no gelation, or excessive thickening, coagulation, lumps, or coarse particles. The maximum allowable increase or decrease in viscosity shall not exceed 10 Krieb units.

5.8 WET ADHESION: Prepare 6" x 17"x 1/4" (15 cm x 43 cm x 0.63 cm) glass panels with a ground surface which has been cleaned according to FED-STD-141, Method 2021. Apply alkyd enamel conforming to Federal Specification TT-E-506 by drawdown with a suitable applicator to obtain a dry film thickness of 3.0 ± 0.3 mils (76 ± 8 micrometers) and a width of 5-1/2" (14 cm). Allow the alkyd enamel to dry in a horizontal position for three days at 74-80°F (23-27°C) and 50% ± 5% relative humidity. Bake two hours at 200°F (93°C) prior to the application of the test paint. Apply the test paint by drawdown as above in a direction perpendicular to the long axis of the

