

SSPC: The Society for Protective Coatings

COATING SYSTEM NO. 27.00

Alkyd Coating System Materials Specification, Performance-Based

1. Scope

1.1 This specification covers the requirements for an air-drying solvent-based alkyd coating system consisting of two or more coats of alkyd intended for use over blast cleaned steel (See Note 13.1.). The specification covers both the system and the individual coating requirements. The requirements are based primarily on the performance of the coating system.

1.2 The coating system is suitable for exposure in Environmental Zones 1A (interior, normally dry), 1B (exterior, normally dry), 2A (frequently wet by fresh water, excluding immersion), and 2B (frequently wet by salt water, excluding immersion) (See Note 13.2.). The coating system is classified according to the drying time (fast, medium, slow) of the slowest drying coating layer.

2. Description

2.1 This multi-coat alkyd coating system specification does not cover coating systems comprised of water-reducible alkyds.

2.2 DRYING TIME: The coating system shall be classified as Type 1 (fast drying), Type 2 (medium drying), or Type 3 (slow drying). See Section 6.4 regarding test methods and criteria for drying time.

2.3 FINISH COAT GLOSS: The finish coat shall be designated as flat, semigloss, or gloss in accordance with Section 7.3.

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. Standards marked with an asterisk (*) are referenced only in the Notes, which are not requirements of this specification.

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:

Guide 13

Guide for the Identification and Use of

PA 1

Industrial Coating Systems in Computerized Product Databases
Shop, Field, and Maintenance Painting of Steel

PA 2

Measurement of Dry Coating Thickness with Magnetic Gages

SP 1

Solvent Cleaning

SP 5/NACE No. 1

White Metal Blast Cleaning

VIS 2

Standard Method of Evaluating Degree of Rusting on Painted Steel Surfaces

3.4 AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM) STANDARDS:

A 36

Standard Specification for Carbon Structural Steel

A 607

Standard Specification for Steel, Sheet and Strip, High-Strength, Low-Alloy, Columbium or Vanadium, or Both, Hot-Rolled and Cold-Rolled (Withdrawn 2000; Replaced by A1008 and A1011/A1011M)

D 522

Standard Test Methods for Mandrel Bend Test of Attached Organic Coatings

D 523

Standard Test Method for Specular Gloss

* **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 823**

Standard Practices for Producing Films of Uniform Thickness of Paint, Varnish, and Related Products on Test Panels

* **D 1296**

Standard Test Method for Odor of Volatile Solvents and Diluents

* **D 1475**

Standard Test Method for Density of Liquid Coatings, Inks, and Related Products

* **D 1535**

Standard Practice for Specifying Color by the Munsell System

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

- * **D 2621** of Solvent-Reducible Paints
Standard Test Method for Infrared Identification of Vehicle Solids from Solvent-Reducible Paints
- D 3359** Standard Test Methods for Measuring Adhesion by Tape Test
- D 3363** Standard Test Method for Film Hardness by Pencil Test
- D 3925** Standard Practice for Sampling Liquid Paints and Related Pigmented Coatings
- D 4417** Standard Test Methods for Field Measurement of Surface Profile of Blast Cleaned Steel
- D 4585** Standard Practice for Testing the Water Resistance of Coatings Using Controlled Condensation
- D 4940** Standard Test Method for Conductimetric Analysis of Water-Soluble Ionic Contamination of Blasting Abrasives
- 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:

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

3.6 FEDERAL SPECIFICATIONS AND STANDARDS:

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

- Method 3011** Condition in Container
- Method 3021** Skinning (Partially Filled Container)
- Method 4321** Brushing Properties
- Method 4331** Spraying Properties
- Method 4541** Working Properties and Appearance of Dried Film

4. Composition Requirements of Coating

4.1 RESIN REQUIREMENT: The resin component (non-volatile vehicle) shall be a minimum of 50% by weight of alkyd. An alkyd resin is defined as a resin system primarily derived from the esterification reaction product of a polyhydric alcohol and a polybasic acid, fatty acid, or oil. The specification permits latitude to the coating supplier in the choice of alkyd resins. Modified alkyd resins, including cross reaction products with other common resin forming polymers, are allowed. These include, but are not restricted to, urethane modified alkyd resins and alkyd phenolic resins (See Note 13.3.).

4.2 PIGMENT REQUIREMENT: Lead or chromate based pigments are prohibited (See Note 13.4.).

5. Standard Testing Conditions

5.1 ATMOSPHERIC CONDITIONS: When testing the paint and its application, the temperature under which it is applied and cured shall be $23 \pm 2^\circ\text{C}$ ($73.5 \pm 3.5^\circ\text{F}$).

5.2 SUBSTRATE: The hot rolled steel test panels shall conform to ASTM A 670, Grade 50 (See Note 13.5.).

5.3 TEST PANELS: Steel test panels measuring 75 mm x 150 mm x 3.2 mm (3 inch x 6 inch x 1/8 inch) or greater shall be blast cleaned to SSPC-SP 5/NACE No. 1. Test panels shall be solvent cleaned in accordance with SSPC-SP 1 prior to blast cleaning. The type of blast media shall be clearly identified and have conductivity less than $100 \mu\text{S}$ per ASTM D 4940. The panels shall have a nominal anchor pattern of $50 \pm 25 \mu\text{m}$ (2.0 ± 1.0 mils) per ASTM D 4417.

5.4 APPLICATION: Apply the paint at the atmospheric conditions described in Section 5.1 in accordance with SSPC-PA 1 by spray to the front of the test panels. (See Note 13.6.) The number of coats shall be selected to match the manufacturer's recommendations.

5.5 DRY FILM THICKNESS: The dry film thickness (DFT) shall be within the manufacturer's written recommended range per coat and shall not exceed the stated minimum by more than 25 micrometers (1 mil). If there is no recommended film thickness, then the thickness shall be 50 ± 13 micrometers (2.0 ± 0.5 mils) per coat. The film thickness shall be measured in accordance with SSPC-PA 2 (See Note 13.7.).

5.6 CURE: Prior to any exposure testing, all panels shall be cured for a minimum of 14 and a maximum of 30 days at 16 to 27°C (60 to 80°F) and 35 to 65% relative humidity after application of the final coat.

5.7 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 1.2 cm (0.5 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 at least 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.

6. Requirements of Liquid Coating

6.1 WORKING PROPERTIES: The paint shall be easily applied by brush, roller, or spray when tested in accordance with FED-STD-141, Methods 4321, 4331, and 4541. The paint shall show no streaking, running, or sagging during application