

# SSPC: The Society for Protective Coatings

## PAINT SPECIFICATION NO. 34

### Water-Borne Epoxy Topcoat for Steel Surfaces

#### 1. Scope

**1.1** This specification covers an ambient-cured, two-component water-borne epoxy coating that is intended for use as a finish coat in multicoat water-borne epoxy systems for steel.

**1.2** Topcoats are categorized according to performance levels (Sections 2.3, 6, and 7).

**1.3** Topcoats meeting this specification, when used with an appropriate primer, are suitable for exposures in Environmental Zones 1A (interior, normally dry), 1B (exterior, normally dry), 2A (frequently wet by fresh water), 2B (frequently wet by salt water), and 3C (chemical exposure, alkaline).

**1.4** The specified topcoat is intended for application by brush, spray, or roller over primed surfaces prepared in accordance with the manufacturer's recommendations. It is suitable for use as a water-borne epoxy topcoat in a two-coat system or as an intermediate coat and topcoat in a three-coat system, to be applied in accordance with the manufacturer's recommendations.

#### 2. Description

##### 2.1 COMPOSITION

**2.1.1** The topcoat specified is based on a reactive oxirane (epoxy) functional resin with amine or acid functional curing agents.

**2.1.2** The major volatile component by weight is water. Refer to ASTM D 3792 or ASTM D 4017 for determination of the water content of paints.

##### 2.2 VOLATILE ORGANIC COMPOUND (VOC)

**CONTENT:** Consult applicable government regulations to determine maximum allowable VOC content and the proper VOC test method for a particular application. The supplier should provide VOC information on the coating as supplied (in the container) and as applied (in the field after recommended thinning).

**2.3 PERFORMANCE LEVEL:** The finish coat shall be classified according to exposure performance achieved as follows, based on testing of primed systems as specified.

**Level 1** Accelerated Testing (Section 6)

**Level 2** 12-Month Exterior Exposure (Section 7.2)

**Level 3** 36-Month Exterior Exposure (Section 7.3)

**2.3.1** If no performance level is specified, Level 2 is assumed.

#### 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 reference standards and this specification, the requirements of this specification shall prevail.

##### 3.3 SSPC SPECIFICATIONS:

|                      |                                                                                                       |
|----------------------|-------------------------------------------------------------------------------------------------------|
| <b>SSPC Guide 13</b> | Guide for the Identification and Use of Industrial Coating Material in Computerized Product Databases |
| <b>Paint 28</b>      | Water-Borne Epoxy Primer for Steel Surfaces                                                           |
| <b>PA 1</b>          | Shop, Field, and Maintenance Painting of Steel                                                        |
| <b>PA 2</b>          | Measurement of Dry Coating Thickness with Magnetic Gages                                              |
| <b>SP 10</b>         | Near-White Blast Cleaning                                                                             |
| <b>VIS 2</b>         | Guide and Reference Photographs for Evaluating Degree of Rusting on Painted Steel Surfaces            |

##### 3.4 ASTM INTERNATIONAL STANDARDS:

|               |                                                                                                                                    |
|---------------|------------------------------------------------------------------------------------------------------------------------------------|
| <b>A 36</b>   | Specification for Carbon Structural Steel                                                                                          |
| <b>B 117</b>  | Practice for Operating Salt Spray (Fog) Apparatus                                                                                  |
| <b>D 523</b>  | Test Method for Specular Gloss                                                                                                     |
| <b>D 562</b>  | Test Method for Consistency of Paints Measuring Krebs Unit (KU) Viscosity Using a Stormer-type Viscometer                          |
| <b>D 609</b>  | Practice for Preparation of Cold-Rolled Steel Panels for Testing Paint, Varnish, Conversion Coatings, and Related Coating Products |
| <b>D 610</b>  | Test Method for Evaluating Degree of Rusting on Painted Steel Surfaces                                                             |
| <b>D 714</b>  | Test Method for Evaluating Degree of Blistering of Paints                                                                          |
| <b>D 823</b>  | Practices for Producing Films of Uniform Thickness of Paint, Varnish, and Related Products on Test Panels                          |
| <b>D 1200</b> | Test Method for Viscosity by Ford Viscosity Cup                                                                                    |

- D 1475** Test Method for Density of Liquid Coatings, Inks, and Related Products
- D 1654** Test Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments
- D 2243** Test Method for Freeze-Thaw Resistance of Water-Borne Coatings
- D 2244** Test Method for Calculation of Color Differences from Instrumentally Measured Color Coordinates
- D 2369** Test Method for Volatile Content of Coatings
- D 2574** Test Method for Resistance of Emulsion Paints in the Container to Attack by Microorganisms
- D 3359** Test Methods for Measuring Adhesion by Tape Test
- D 3363** Test Method for Film Hardness by Pencil Test
- D 3792** Test Method for Water Content of Water-Reducible Paints by Direct Injection into a Gas Chromatograph
- D 3924** Specification for Standard Environment for Conditioning and Testing Paint, Varnish, Lacquer, and Related Materials
- D 3925** Practice for Sampling Liquid Paints and Related Pigmented Coatings
- D 3960** Practice for Volatile Organic Compound (VOC) Content of Paints and Related Coatings
- D 4017** Test Method for Water in Paints and Paint Materials by Karl Fischer Method
- D 4060** Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser
- D 4417** Test Methods for Field Measurement of Surface Profile of Blast Cleaned Steel
- D 4585** Practice for Testing the Water Resistance of Coatings Using Controlled Condensation
- G 92** Practice for Characterization of Atmospheric Test Sites

### 3.5 AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI) STANDARD:

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

### 3.6 NACE INTERNATIONAL STANDARD:

- RP 0287** Field Measurement of Surface Profile of Abrasive Blast Cleaned Surfaces Using Replica Tape

### 3.7 U.S. ENVIRONMENTAL PROTECTION AGENCY:

- 40 CFR Chapter 1, Part 60, Appendix A, Method 24—**Determination of Volatile Matter Content, Density, Volume Solids and Weight Solids of Surface Coatings

## 4. Composition

**4.1** The manufacturer is given latitude in the selection of materials, provided the topcoat system meets the requirements of the specification. Materials shall be those used in good commercial practice and entirely suitable for the purpose intended under normal conditions.

**4.2** The coating shall comply with applicable state and local VOC regulations as measured by EPA Method 24, ASTM D 3960, or other required methods. If no method is specified, use EPA Method 24. The supplier should provide information on the coating as supplied in the container and as thinned for application if VOC is to be added in thinning.

## 5. Standard Testing Conditions

**5.1** The standard testing conditions shall be in accordance with the standard atmosphere in ASTM D 3924, unless indicated otherwise. Standard temperature shall be  $23 \pm 2^\circ\text{C}$  ( $73.5 \pm 3.5^\circ\text{F}$ ), and standard relative humidity  $50 \pm 5\%$ .

**5.2** The standard substrate shall be 3.2 mm (1/8 in.) thick ASTM A 36 hot rolled steel abrasive blasted in accordance with SSPC-SP 10 to a profile of  $50 \pm 13$  micrometers ( $2.0 \pm 0.5$  mils) unless indicated otherwise. Measure blast profile in accordance with ASTM D 4417 or NACE RP0287. Sealed and primed chart paper may be used to perform the film irregularity test discussed in Section 6.10.

**5.3** The substrate shall be primed with a compatible water-borne epoxy primer, as defined in SSPC-Paint 28, Section 5.3.

**5.4** The topcoat shall be applied following the manufacturer's recommendations for cure times and method of application.

## 6. Laboratory Performance Testing Requirements

**6.1** For Level 1 (Accelerated Testing), the coating shall meet the requirements of Sections 6.2 through 6.13. For Level 2 and Level 3 (Exterior Exposure), the coating shall meet the requirements of Section 7 in addition to the requirements in Section 6.

**6.2 RESISTANCE TO MICROORGANISMS IN CONTAINER:** The coating shall be resistant to attack by microorganisms when tested in accordance with ASTM D 2574.

**6.3 FREEZE-THAW RESISTANCE:** Test each of the components separately in accordance with ASTM D 2243. At the end of three cycles there shall be no gelling, coagulation, lumps, coarse particles, or viscosity change in excess of 10 Krebs Units per ASTM D 562.