

SSPC: The Society for Protective Coatings

PAINTING SYSTEM GUIDE NO. 1.00

Guide for Selecting Oil Base Painting Systems

Most needs for oil base painting systems can be met by the standard SSPC Painting Systems 1.04 and 1.09 through 1.13 in this section. Other combinations of surface preparation, primers, intermediates, and topcoats may be selected for special situations for oil painting systems using the following Guide. To do so, select the desired surface preparation, primer, intermediate(s), and topcoat from those listed and insert them into the standard SSPC Painting System format. In order to aid in the selection, short comments are given. For additional information consult the "Commentary on Painting Systems" and the referenced standards.

1. Scope

1.1 These specifications cover oil base painting systems for steel cleaned with hand or power tools.

1.2 These systems are suitable for use on parts or structures exposed in Environmental Zone 1A (interior, normally dry) and Zone 1B (exterior, normally dry).

1.3 The oil base primers are slow in drying, but provide the wetting ability necessary for adhesion to nondescaled steel.

1.4 The color of the finish paint must be specified.

2. Description

2.1 This guide outlines the components of a complete oil base painting system. A painting system shall consist of surface preparation by solvent cleaning and hand or power tool cleaning; one coat of oil base primer; one or two intermediate coat(s); and one finish coat.

3. Reference Standards

3.1 The standards referenced in this guide are listed in Section 3.4 through 3.7 and form a part of the specification.

3.2 The latest issue, revision, or amendment of the reference standards in effect on the date of invitation to bid shall govern unless otherwise specified.

3.3 If there is a conflict between the requirements of any of the cited reference standards and the specification, the requirements of the specification shall prevail.

3.4 SSPC STANDARDS AND JOINT STANDARDS:

PA 1	Shop, Field, and Maintenance Painting of Steel
PA 2	Measurement of Dry Coating Thickness With Magnetic Gages
PA Guide 4	Guide to Maintenance Repainting with Oil Base or Alkyd Painting System
Paint 11*	Red Iron, Zinc Chromate, Raw Linseed Oil and Alkyd Primer
Paint 21	White or Colored Silicone Alkyd Paint
Paint 25	Red Iron Oxide, Zinc Oxide, Raw Linseed Oil, and Alkyd Primer
Paint 101	Aluminum Alkyd Paint
Paint 102	Black Alkyd Paint
Paint 103	Black Phenolic Paint
Paint 104	White or Tinted Alkyd Paint
Paint 108	High-Build Thixotropic Leafing Aluminum Paint
PS 1.04	Three-Coat Oil-Alkyd (Lead- and Chromate-Free) Painting System for Galvanized or Non-Galvanized Steel (With Zinc Dust-Zinc Oxide Linseed Oil Primer)
PS 1.09	Three-Coat Oil Base Zinc Oxide Painting System (Without Lead or Chromate Pigment)
PS 1.10	Four-Coat Oil Base Zinc Oxide Painting System (Without Lead or Chromate Pigment)
PS 1.12	Three-Coat Oil Base Zinc Chromate Painting System
PS 1.13	One-Coat Oil Base Slow Drying Maintenance Painting System (Without Lead or Chromate Pigment)
SP 2	Hand Tool Cleaning
SP 3	Power Tool Cleaning
SP 5/NACE No. 1	White Metal Blast Cleaning
SP 6/NACE No. 3	Commercial Blast Cleaning
SP 7/NACE No. 4	Brush-Off Blast Cleaning
SP 8	Pickling
SP 10/NACE No. 2	Near-White Blast Cleaning
SP 11	Power Tool Cleaning to Bare Metal

- SP 12/NACE No. 5** Surface Preparation and Cleaning of Steel and Other Hard Materials by High- and Ultrahigh-Pressure Water Jetting Prior to Recoating
- SP 13/NACE No. 6** Surface Preparation of Concrete
- SP 14/NACE No. 8** Industrial Blast Cleaning

3.5 AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM) STANDARD:

- D 3925** Practice for Sampling Liquid Paints and Related Pigmented Coatings

3.6 FEDERAL STANDARDS:

- TT-E-489** Enamel, Alkyd, Gloss (for Exterior or Interior Surfaces)
- TT-E-527** Enamel, Alkyd, Lusterless
- TT-E-529** Enamel, Alkyd, Semi-Gloss

3.7 AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO):

- M 69** Aluminum Paint

4. Surface Preparation

4.1 SSPC-SP 2, "Hand Tool Cleaning," or SSPC-SP 3, "Power Tool Cleaning":

COMMENT: Blast cleaning (SSPC-SP 5, SP 6, SP 7, SP 10, SP 14) or pickling (SSPC-SP 8) or water jetting (SSPC-SP 12) may be substituted. However, for economy, hand or power tool cleaning is generally used with the primers in this painting system guide. The primers have good to excellent wetting ability and do not require removal of all tight rust and tight mill scale if used in normal or mild atmospheric exposure. However, blast cleaning and pickling surface preparation methods are considered more thorough, and the better cleaning they provide may be more economical or may be required for moderately corrosive conditions. They are therefore very satisfactory alternatives unless warping, safety, or other special considerations make them impractical in particular cases.

5. Paints

5.1 OIL BASE PRIMERS: After cleaning, the steel shall be primed with one coat of paint conforming with one of the following specifications.

5.1.1 Proprietary Primer:

COMMENT: A proprietary primer of proven performance capability should be chosen. Specify the manufacturer, trade name, and product number of the desired

proprietary paint. The paint manufacturer should furnish a typical label analysis.

5.2 OIL/ALKYD PRIMERS: Alternately the steel shall be primed with one of the following primers.

COMMENT: These primers contain some alkyd resin in addition to their linseed oil content, and may require a more thorough cleaning, as a minimum surface preparation, than straight oil base primers.

5.2.1 SSPC-Paint 11*, "Red Iron Oxide, Zinc Chromate, Raw Linseed Oil and Alkyd Primer":

5.2.2 SSPC-Paint 25, "Red Iron Oxide, Zinc Oxide, Raw Linseed Oil and Alkyd Primer":

COMMENT: SSPC-Paint 25 is an iron oxide, zinc oxide primer similar in composition to SSPCPaint 11 except that zinc chromate is replaced with zinc oxide.

5.3 INTERMEDIATE COAT(S) FOR OIL BASE PAINTING SYSTEMS:

The intermediate coat(s) of paint shall conform with one of the following specifications. Also, the intermediate coat(s) of paint may be the same as the prime coat, but shall be tinted with carbon black or lampblack paste in oil, or may instead be the same as the finish coat but tinted to contrast with the finish coat. If an aluminum finish coat is used, the next to last (intermediate) coat may be the same as the last (finish) coat except that the corresponding non-leafing aluminum pigment shall be used in place of leafing aluminum.

5.3.1 SSPC-Paint 101, "Aluminum Alkyd Paint," Type II, "Non-Leafing":

COMMENT: This non-leafing aluminum paint is suitable for use as an intermediate coat where the final paint coat is to be a leafing aluminum paint and where longer weathering without the prime coat showing through the aluminum finish coat is desired.

5.3.2 Proprietary Intermediate:

COMMENT: A proprietary intermediate of proved performance capability may be substituted for the above if desired by the specifier. Specify the manufacturer, trade name, and product number of the desired proprietary paint. The paint manufacturer should furnish a typical label analysis.

5.4 ALUMINUM FINISH COATS: The paint shall conform with one of the following specifications.

5.4.1 SSPC-Paint 101, "Aluminum Alkyd Paint," Type I, "Leafing":

COMMENT: This aluminum alkyd paint has good stability, drying, and application properties as well as excellent durability in atmospheric exposures. Its lapping properties are fairly good. It is generally mixed on the job by adding two

pounds of aluminum paste to one gallon of alkyd varnish vehicle.

5.4.2 SSPC-Paint 108, "High Build Thixotropic Leafting Aluminum Paint":

COMMENT: Added protection is possible because of the thicker film which may be applied with this special high build composition.

5.4.3 AASHTO Specification, "Aluminum Paint," Designation M 69:

COMMENT: AASHTO ready to mix aluminum finish coat for bridges, having an oleoresinous tung oil spar varnish vehicle.

5.5 BLACK FINISH COATS: The paint shall conform with one of the following specifications.

5.5.1 SSPC-Paint 102, "Black Alkyd Paint":

COMMENT: A very durable carbon black and long oil alkyd varnish paint which is recommended for severe exposures such as railroad bridges and industrial atmospheres.

5.5.2 SSPC-Paint 103, "Black Phenolic Paint":

COMMENT: A carbon black and silica phenolic varnish paint which is suitable for water immersion, high humidity, condensation, industrial atmospheres, or chemical environments.

5.6 WHITE OR TINTED FINISH COATS: If a colored finish coat is specified, the type and shade should be agreed upon between the parties concerned, using a suitable method of color designation. The paint shall conform with one of the following specifications.

5.6.1 SSPC-Paint 104, "White or Tinted Alkyd Paint":

COMMENT: A long oil alkyd paint that has good stability, drying, and application properties as well as excellent durability in atmospheric exposures. It has good resistance to atmospheric exposure, particularly industrial atmospheres.

5.6.2 Federal Specification TT-E-489 Class A, "Enamel Alkyd, Gloss (for Exterior or Interior Surfaces)":

COMMENT: A series of medium oil, alkyd colored enamels, suitable for interior or exterior use; high gloss but low build per coat; particularly suited for machinery and similar equipment where appearance is important.

5.6.3 Federal Specification TT-E-529 Class A, "Enamel, Alkyd, Semi Gloss":

COMMENT: Similar to preceding, but semi-gloss.

5.6.4 Federal Specification TT-E-527, "Enamel, Alkyd, Lusterless":

COMMENT: Similar to preceding two paints, but flat

finish.

5.6.5 SSPC-Paint 21, "White or Colored Silicone Alkyd Paint," Type I, "High Gloss" or Type II, "Medium Gloss":

COMMENT: Silicone alkyd paints are highly weather resistant and are characterized by excellent color and gloss retention. Twelve colors are described under each type.

5.7 PROPRIETARY FINISH:

COMMENT: A proprietary finish of proved performance capability may be substituted for any of the above if desired by the specifier. Specify the manufacturer, trade name, color, and product number of the desired proprietary paint. The paint manufacturer should furnish a typical label analysis.

6. Paint Application

6.1 PAINT APPLICATION: Follow the requirements of SSPC-PA 1, "Shop, Field, and Maintenance Painting".

COMMENT: When short oil alkyd or phenolic finish coats or intermediate coats are used over oil base paints, at least one week drying time should be allowed for the oil base paint.

6.2 FIELD TOUCH-UP PAINTING: In accordance with specification SSPC-PA 1, "Shop, Field, and Maintenance Painting" and in particular with section thereof entitled "Field Painting."

6.3 MAINTENANCE PAINTING: The provisions of SSPC-PA Guide 4, "Guide to Maintenance Repainting with Oil Base or Alkyd Painting Systems," should be followed.

COMMENT: This guide covers the steps necessary for repaint previously painted steel surfaces.

6.4 NUMBER OF COATS: A minimum of three.

COMMENT: Three coats are required for usual conditions. Two coats will result in an uneconomically thin paint film and shorter life in normal atmospheric exposures. Four coats are recommended in more severe exposures such as near the seashore and areas of high humidity.

6.5 DRY FILM THICKNESS OF PAINT SYSTEM: Not less than the following as measured in accordance with SSPC-PA 2, "Measurement of Dry Coating Thickness with Magnetic Gages": primer 50 micrometers (2.0 mils); for a three-coat system 115 micrometers (4.5 mils); for a four-coat painting system 150 micrometers (6.0 mils).

7. Inspection

7.1 All work and materials supplied under this specification is subject to timely inspection by the purchaser or his authorized representative. The contractor shall correct such work or replace such material as is found defective under

this specification. In case of dispute, unless otherwise specified, the arbitration or settlement procedure established in the procurement documents shall be followed. If no arbitration procedure is established, the procedure specified by the American Arbitration Association shall be used.

7.2 Samples of paints under this painting system may be requested by the purchaser and shall be supplied upon request along with the manufacturer's name and identification for the materials. Samples may be requested at the time the purchase order is placed, or may be taken from unopened containers at the job site.

7.3 Unless otherwise specified, the sampling shall be in accordance with ASTM D 3925.

7.4 The procurement documents should establish the responsibility for samples, testing, and any required affidavit certifying full compliance with the specification.

8. Disclaimer

8.1 While every precaution is taken to ensure that all information furnished in SSPC standards and specifications is as accurate, complete, and useful as possible, SSPC cannot assume responsibility nor incur any obligation resulting from the use of any materials, coatings, or methods specified herein, or of the specification or standard itself.

8.2 This specification does not attempt to address problems concerning safety associated with its use. The user of this specification, as well as the user of all products or practices described herein, is responsible for instituting appropriate health and safety practices and for insuring compliance with all governmental regulations.

* This paint contains chromate pigments. Users are urged to follow all health, safety, and environmental requirements in applying, handling or disposing of these materials.