

**SECTION 09 96 00
RESINOUS URETHANE AND EPOXY COATING**

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This section specifies exterior-rated surfacing epoxy filler and resinous coatings for concrete and cast-iron surfaces.

1.2 RELATED WORK

- A. Concrete: Section 03 30 00, CAST-IN-PLACE CONCRETE.
B. Masonry: Section 04 01 00, MAINTENANCE OF MASONRY.
C. Paint: Section 09 91 00, PAINT.

1.3 SUBMITTALS

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
B. Manufacturer's Literature and Data:
1. Description of each product to be provided.
2. Application and installation instructions.
3. Maintenance Instructions: Submit manufacturer's written instructions for recommended maintenance practices.
C. Qualification Data: For Installer.
D. Samples: Provide a color swatch for each color and texture specified. Color swatch is not required for surfacing epoxy filler.
E. Certifications and Approvals:
1. Manufacturer's certification of material and substrate compliance with specification.
2. Manufacturer's concurrence of applicability of products for the intended use.
F. Warranty: As specified in this section.
G. Closeout submittals: Provide manufacturer's maintenance instructions that include recommendations for periodic cleaning and maintenance of coatings specified.

1.4 QUALITY ASSURANCE

- A. Manufacture Certificate: Manufacture shall certify that the individual components of the coating system, as well as the combined use of the components, have been manufactured and in use for a minimum of (5) five years.
B. Installer Qualifications: Engage an experienced installer (applicator) who is experienced in applying resinous coating systems similar in

material, design, and extent to those indicated for this project for a minimum period of five (5) years, whose work has resulted in applications with a record of successful in-service performance, and who is acceptable to coatings' manufacturer.

1. Contractor shall have completed at least five (5) projects of similar size and complexity. Include list of at least five (5) projects. List must include owner (purchaser); address of installation, contact information at installation project site; and date of installation.
2. Installer's Personnel: Employ persons trained for application of specified product.

C. Source Limitations:

1. Obtain primary coating materials including primers, resins, hardening agents, grouting coats and finish or sealing coats from a single manufacturer.
2. Provide secondary materials, including patching and fill material, joint sealant, and repair material of type and from source that is compatible with the manufacturer of primary materials. If primary and secondary materials are not provided by the same manufacturer, provide written assurance that the products are compatible.

D. Pre-Installation Conference:

1. Convene a meeting not less than thirty days prior to starting work.
2. Attendance:
 - a. Contractor
 - b. Coating Applicator
 - c. VA COR
 - d. Manufacturer's Representative
3. Review the following:
 - a. Environmental requirements
 - 1) Air and surface temperature
 - 2) Relative humidity
 - 3) Ventilation
 - 4) Dust and contaminants
 - b. Protection of surfaces not scheduled to be coated.
 - c. Inspect and discuss condition of substrate and other preparatory work performed.
 - d. Review and verify availability of material; installer's personnel, equipment needed.

- e. Performance of the coating with chemicals anticipated in the area receiving the resinous coating system.
 - f. Application and repair, including verification of dry film thickness (DFT) for each layer.
 - g. Field quality control, including verification of pot life.
 - h. Cleaning.
 - i. Protection of coating systems.
 - j. Coordination with other work.
- E. Manufacturer's Field Services: Manufacturer's representative shall provide technical assistance and guidance for surface preparation and application of resinous flooring systems.
- F. Contractor Job Site Log: Contractor shall document daily; the work accomplished environmental conditions and any other condition event significant to the long term performance of the coating system installation. The Contractor shall maintain these records for one year after Substantial Completion.
- G. Volatile Organic Compound content to remain under 100g/liter.

1.5 MATERIAL PACKAGING DELIVERY AND STORAGE

- A. Deliver materials to the site in original sealed packages or containers, clearly marked with the manufacturer's name or brand, type and color, production run, lot or batch number and date of manufacture.
- B. Protect materials from damage and contamination in storage or delivery, including moisture, heat, cold, direct sunlight, etc.
- C. Maintain temperature of storage area between 60 and 80 degrees F (15 and 26 degrees C).
- D. Keep containers sealed until ready for use.
- E. Do not use materials beyond manufacturer's shelf life limits.
- F. Package materials in factory pre-weighed and in single, easy to manage batches sized for ease of handling and mixing proportions from entire package or packages. No on-site weighing or volumetric measurements are allowed.

1.6 PROJECT CONDITIONS

- A. Environmental Limitations: Comply with manufacturer's written instructions for substrate temperature, ambient temperature, moisture, ventilation, and other conditions affecting application.
 - 1. Maintain material and substrate temperature per manufacturer's requirements during application and for not less than 24 hours after application.

2. New concrete and cement grout substrate shall be properly cured per referenced section 03 30 53, CAST-IN-PLACE CONCRETE and 04 01 00 MAINTENANCE OF MASONRY. Standard cure time a minimum of 30 days.

B. Close coated areas to traffic during application and for not less than 24 hours after application, unless manufacturer recommends a longer period.

1.7 WARRANTY

A. Work subject to the terms of the Article "Warranty of Construction" FAR clause 52.246-21.

B. Warranty: Manufacture shall furnish a single, written warranty covering the full assembly for both materials and workmanship for an extended period of three (3) full years from date of installation, or provide a joint and several warranty signed on a single document by manufacturer and applicator jointly and severally warranting the materials and workmanship for a period of three (3) full years from date of installation. A sample warranty letter must be included with bid package or bid may be disqualified.

1.8 APPLICABLE PUBLICATIONS

A. The publication listed below form a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only.

B. Society of Protective Coatings (SSPC):

SP6 - "Commercial Blast Cleaning". This standard covers the requirements for cleaning and the surface preparation for cast iron.

SP13 - "Surface Preparation of Concrete". This standard covers the requirements for cleaning and the surface preparation for coatings to be used over concrete.

Paint Standard 36 - "Accelerated Weathering Requirements"

C. American Society for Testing and Materials (ASTM):

C307 (2012).....Tensile Strength of Chemical-Resistant Mortar,
Grouts, and Monolithic Surfacing

C413 (2012).....Absorption of Chemical-Resistant Mortars,
Grouts, Monolithic Surfacing, and Polymer
Concretes

C531 (2012).....Linear Shrinkage and Coefficient of Thermal
Expansion of Chemical-Resistant Mortars,
Grouts, Monolithic Surfacing, and Polymer
Concretes

C579 (2012).....	Compressive Strength of Chemical-Resistant Mortars, Grouts, Monolithic Surfacing, and Polymer Concretes
C580 (2012).....	Flexural Strength and Modulus of Elasticity of Chemical-Resistant Mortars, Grouts, Monolithic Surfacing, and Polymer Concretes
D638 (2010).....	Tensile Properties of Plastics
D2794 (2010).....	Resistance of Organic Coatings to the Effects of Rapid Deformation Impact
D4060(2010).....	Abrasion Resistance of Organic Coatings by the Taber Abraser
D4259 (2012).....	Abrading Concrete to alter the surface profile of the concrete and to remove foreign materials and weak surface laitance
D7234 (2012).....	Pull-Off Adhesion Strength of Coatings on Concrete Using Portable Pull-Off Adhesion Testers
E96/E96M (2012).....	Water Vapor Transmission of Materials
F1679.....	Variable Incidence Tribometer for determining the slip resistance
F1869 (2011).....	Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride
F2170 (2011).....	Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION FOR POLYAMIDE EPOXY PRIMER AND ALIPHATIC ACRYLIC POLYURETHANE COATINGS

- A. System Descriptions: Monolithic, multi-component coating system to be applied per manufacturer's recommendations. Surface layer must meet SSPC Paint Standard 36 for weathering durability.
- B. Products: Subject to compliance with applicable fire, health, environmental, and safety requirements for storage, handling, installation, and clean up.
- C. System Components: Verify specific requirements as systems vary by manufacturer. Verify that primer base product is compatible with intended use, substrate and also with top coat material. Use

manufacturer's standard components, compatible with each other and as follows:

1. Primer (base coat):
 - a. Resin: Polyamide Epoxy.
 - b. Formulation Description: Pigmented, multiple component, high solids.
 - c. Application Method: Air spray, airless spray, roller or brush as recommended by the manufacturer.
 - d. Thickness of coat: Verify thickness with manufacturer as systems vary by manufacturer; Minimum DFT shall be 4.0 mils.
 - e. Number of Coats: Minimum of one coat. Apply coats as necessary to achieve minimum DFT.
2. Top Coat:
 - a. Resin: Aliphatic Acrylic Urethane.
 - b. Formulation Description: Pigmented, Two-component, high solids.
 - c. Application Method: Air spray, airless spray, roller or brush as recommended by the manufacturer.
 - d. Thickness of Coats: Verify thickness with manufacturer as systems vary by manufacturer; Minimum DFT thickness shall be 2.5 mils for each coat.
 - d. Number of Coats: Minimum of two coats. Apply additional coats as necessary to achieve minimum DFT.

2.2 SYSTEM DESCRIPTION FOR MODIFIED POLYAMIDE SURFACING EPOXY

- A. System Description: Modified Polyamide Epoxy resinous troweled surface and crack filler. Surfacing epoxy shall be two component, 100% solids material. Texture dependent on use of areas.
- B. Products: Subject to compliance with applicable fire, health, environmental, and safety requirements for storage, handling, installation, and clean up.
- C. System Components: Verify specific requirements as systems vary by manufacturer. Follow manufacturer's requirements per approved submittal.
- D. System Characteristics:
 1. Color: White or gray.
 2. Overall System Thickness: As required with a maximum thickness of 2" (5.08 cm).
 3. Finish: Standard.

4. Temperature Range: Systems vary by manufacturer; approximate range from a minimum of 35 to 130 degrees F (2 to 54 degrees C).

PART 3 - EXECUTION

3.1 INSPECTION

- A. Examine the areas and conditions where coating system (coatings and epoxy mortar) is to be installed with the COR. Coating shall not begin until COR and design engineer have determined that the substrate surface preparation requirements have been met for the proposed coating system.

3.2 PROJECT CONDITIONS

- A. Coating process shall not occur unless the minimum surface and ambient air temperatures are within the coating manufacturer's range and will remain within that range for the duration of the cure time.
- B. Do not install coatings until all parts of the surface are fully dry and cured. Contractor shall measure surface moisture content to confirm that it is within coating manufacturer's requirements.
- C. Maintain proper ventilation of the area during application and curing time period. Comply with infection control measures of the VA Medical Center.

3.3 INSTALLATION REQUIREMENTS

- A. The manufacturer's instructions for application and installation shall be followed and reviewed with the COR prior to the start of application.

3.4 PREPARATION

- A. General: Prepare and clean substrates according to coating manufacturer's written instructions for substrate indicated.
- B. Concrete Substrates: Provide sound concrete surfaces free of laitance, glaze, efflorescence, curing compounds, form-release agents, dust, dirt, grease, oil, and other contaminants incompatible with resinous flooring. Substrate shall meet the requirements in SSPC-SP13. Fill depressions, holes, cracks and gaps with surfacing epoxy to the satisfaction of the COR.
- C. Cast-Iron Appurtenances: Clean cast iron surfaces to be coated to SSPC-SP6.
- D. Resinous Materials: Mix components and prepare materials according to manufacturer's written instructions. Mix only that amount which can be used within the pot-life timeframe. Discard any mixed material that

exceeds the maximum allowable pot life. Any material discarded due to contamination, surface marring, unanticipated weather conditions, exceedance of pot life or any other reason, shall be replaced at no cost to the VA.

3.5 APPLICATION

- A. General: Apply mixed components according to manufacturer's written instructions to produce a uniform, monolithic surface.
 - 1. Coordinate application of components to provide optimum adhesion of resinous coating system to substrate, and optimum inter-coat adhesion.
 - 2. Allow the resinous coating components to cure according to manufacturer's written instructions. Note that both minimum and maximum curing times may apply. Prevent contamination during application and curing processes.
- B. Apply Surfacing Epoxy Filler: Apply as and where required.
- C. Apply Primer: Mix and apply over prepared substrate at manufacturer's recommended spreading rate and as specified herein. Seamlessly coat concrete and cast-iron appurtenance surfaces.
- D. Topcoat: Mix and apply the topcoats over primer coat(s) with strict adherence to manufacturer's installation procedures and coverage rates and as specified herein. Seamlessly coat concrete and cast-iron appurtenance surfaces.

3.8 CURING, PROTECTION AND CLEANING

- A. Allow surfacing filler and resinous coating materials to cure in compliance with manufacturer's directions, taking care to prevent contamination during stages of application and prior to completion of curing process.
- B. Close area of application to foot or vehicle traffic for a minimum of 24 hours or the manufacturer's cure time for the product used, whichever is greater.

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