

SECTION 096723 - RESINOUS FLOORING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes resinous flooring systems.
- B. Related Sections:
 - 1. Section 096623 "Resinous Matrix Terrazzo Flooring" for thinset, epoxy-matrix terrazzo.

1.3 PREINSTALLATION MEETINGS

- A. Pre-installation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include manufacturer's technical data, application instructions, and recommendations for each resinous flooring component required.
- B. Sustainable Design Submittals:
 - 1. Laboratory Test Reports: For flooring products, indicating compliance with requirements for low-emitting materials.
- C. Samples for Initial Selection: For each type of exposed finish required.
- D. Samples for Verification: For each resinous flooring system required, 6 inches (150 mm) square, applied to a rigid backing by Installer for this Project.

1.5 INFORMATIONAL SUBMITTALS

- A. Installer Certificates: Signed by manufacturer certifying that installers comply with specified requirements.
- B. Material Certificates: For each resinous flooring component, from manufacturer.
- C. Material Test Reports: For each resinous flooring system, by a qualified testing agency.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For resinous flooring to include in maintenance manuals.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.
- B. Engage an installer who is certified in writing by resinous flooring manufacturer as qualified to apply resinous flooring systems indicated.
- C. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 - 1. Apply full-thickness mockups on 96-inch- (2400-mm-) square floor area selected by Architect.
 - a. Include 96-inch (2400-mm) length of integral cove base with inside **and outside** corner.
 - 2. Simulate finished lighting conditions for Architect's review of mockups.
 - 3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 - 4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in original packages and containers, with seals unbroken, bearing manufacturer's labels indicating brand name and directions for storage and mixing with other components.

1.9 FIELD CONDITIONS

- A. Environmental Limitations: Comply with resinous flooring manufacturer's written instructions for substrate temperature, ambient temperature, moisture, ventilation, and other conditions affecting resinous flooring application.
- B. Lighting: Provide permanent lighting or, if permanent lighting is not in place, simulate permanent lighting conditions during resinous flooring application.
- C. Close spaces to traffic during resinous flooring application and for 24 hours after application unless manufacturer recommends a longer period.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. VOC Content of Liquid-Applied Flooring Components: Not more than 100 g/L when calculated in accordance with 40 CFR 59, Subpart D (EPA Method 24).
- B. Flammability: Self-extinguishing in accordance with ASTM D635.

2.2 MANUFACTURERS

- A. Source Limitations: Obtain primary resinous flooring materials, including primers, resins, hardening agents, grouting coats, and topcoats, from single source from single manufacturer. Obtain secondary materials, including patching and fill material, joint sealant, and repair materials, of type and from manufacturer recommended in writing by manufacturer of primary materials.

2.3 RESINOUS FLOORING (EF-1)

- A. Resinous Flooring System: Abrasion-, impact-, and chemical-resistant, aggregate-filled, and resin-based monolithic floor surfacing designed to produce a seamless floor and integral cove base.
1. Basis-of-Design Product: Subject to compliance with requirements, provide Sherwin Williams EPO-FLEX MER I, or equivalent product from available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
- a. BASF Corp. - Construction Chemicals.
 - b. Duraflex, Inc.
 - c. Sherwin-Williams Company, General Polymers.
 - d. Tnemec Inc.
- B. System Characteristics:
- 1. Color and Pattern: As selected by Architect from manufacturer's full range.
 - 2. Wearing Surface: Textured for slip resistance.
 - 3. Overall System Thickness: Heavy-Duty Self Leveling: 40 to 175 mils (1.0 to 4.4 mm).
- C. Primer: Type recommended by resinous flooring manufacturer for substrate and resinous flooring system indicated.
1. Basis-of-Design Product: Subject to compliance with requirements, provide Sherwin-Williams Company 3579; Standard Primer or comparable product.
- D. Patching and Fill Material: Resinous product of or approved by resinous flooring manufacturer and recommended by manufacturer for application indicated.
- E. Body Coats:
1. Basis-of-Design Product: Subject to compliance with requirements, provide Sherwin-Williams Company, 3555 EPO-FLEX HD Epoxy Coating or comparable product.
- a. Resin: Epoxy.
 - b. Formulation Description: High solids.
 - c. Type: Pigmented.
 - d. Application Method: Thin-film system.
 - e. Number of Coats: One.
- F. Topcoats: Sealing or finish coats.
1. Basis-of-Design Product: Subject to compliance with requirements, provide Sherwin-Williams Company, 3555 EPO-FLEX HD Epoxy Coating with 5310-8 Dry Silica or comparable product.
- a. Resin: Epoxy.
 - b. Formulation Description: High solids.
 - c. Type: Pigmented.

- d. Application Method: Thin-film system.
- e. Number of Coats: One.
- f. Aggregates: Manufacturer's standard.

G. System Physical Properties: Provide resinous flooring system with the following minimum physical property requirements when tested in accordance with test methods indicated:

- 1. Tensile Strength: 1,700 psi minimum in accordance with ASTM D412.
- 2. Impact Resistance: No chipping, cracking, or delamination and not more than 1/16-inch (1.6-mm) permanent indentation in accordance with MIL-D-3134J.
- 3. Resistance to Elevated Temperature: No slip or flow of more than 1/16 inch (1.6 mm) in accordance with MIL-D-3134J.
- 4. Abrasion Resistance: 100 mg maximum weight loss in accordance with ASTM D4060.
- 5. Hardness: 24 hours Shore D in accordance with ASTM D2240.
- 6. Critical Radiant Flux: 0.45 W/sq. cm or greater in accordance with NFPA 253.

2.4 RESINOUS FLOORING (ER-1)

A. Resinous Flooring System: Abrasion-, impact-, and chemical-resistant, aggregate-filled, and resin-based monolithic floor surfacing designed to produce a seamless floor and integral cove base.

- 1. Basis-of-Design Product: Subject to compliance with requirements, provide DUR-A-FLEX Shop Floor MR or comparable product by one of the following:
 - a. BASF Corp. - Construction Chemicals.
 - b. Duraflex, Inc.
 - c. Sherwin-Williams Company, General Polymers.
 - d. Tnemec Inc.

B. System Characteristics:

- 1. Color and Pattern: As selected by Architect from manufacturer's full range.
- 2. Wearing Surface: Manufacturer's standard wearing surface.
- 3. Overall System Thickness: Heavy-Duty Self Leveling: 40 to 175 mils (1.0 to 4.4 mm).

C. Primer: Type recommended by resinous flooring manufacturer for substrate and resinous flooring system indicated.

- 1. Basis-of-Design Product: Subject to compliance with requirements, provide Dur-A-Flex Inc., Dur-A-Glaze #4 WB or comparable product.

D. Patching and Fill Material: Resinous product of or approved by resinous flooring manufacturer and recommended by manufacturer for application indicated.

E. Body Coats:

- 1. Basis-of-Design Product: Subject to compliance with requirements, provide Dur-A-Flex Inc., Dur-A-Glaze #4 WB or comparable product.
 - a. Resin: Epoxy.
 - b. Formulation Description: High solids.
 - c. Type: Pigmented.
 - d. Application Method: Thin-film system.
 - e. Number of Coats: One.
 - f. Thickness of Coats: 4 to 8 mils (0.01 to 0.2 mm).

- F. Topcoats: Sealing or finish coats.
1. Basis-of-Design Product: Subject to compliance with requirements, provide Dur-A-Flex Inc., Armor Top or comparable product.
 - a. Resin: Epoxy.
 - b. Formulation Description: High solids.
 - c. Type: Pigmented.
 - d. Number of Coats: One.
 - e. Thickness of Coats: 4 to 8 mils (0.1 to 0.2 mm).
 - f. Finish: Semi-gloss.
 - g. Aggregates: Manufacturer's standard.
- G. System Physical Properties: Provide resinous flooring system with the following minimum physical property requirements when tested in accordance with test methods indicated:
1. Compressive Strength: 12,500 psi minimum in accordance with ASTM C579.
 2. Tensile Strength: 2,600 psi minimum in accordance with ASTM C307.
 3. Water Absorption: 0.04 percent maximum in accordance with ASTM D570.
 4. Indentation: 0.025 percent maximum in accordance with MIL-D-3134J.
 5. Impact Resistance: No chipping, cracking, or delamination and not more than 1/16-inch (1.6-mm) permanent indentation in accordance with MIL-D-3134J.
 6. Resistance to Elevated Temperature: No slip or flow of more than 1/16 inch (1.6 mm) in accordance with MIL-D-3134J.
 7. Abrasion Resistance: 4 to 8 mg maximum weight loss in accordance with ASTM D4060.
 8. Hardness: 75-80, Shore D in accordance with ASTM D2240.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Prepare and clean substrates in accordance with resinous flooring manufacturer's written instructions for substrate indicated. Provide clean, dry substrate for resinous flooring application.
- 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.
1. Roughen concrete substrates as follows:
 - a. Shot-blast surfaces with an apparatus that abrades the concrete surface, contains the dispensed shot within the apparatus, and recirculates the shot by vacuum pickup.
 - b. Comply with ASTM C811 requirements unless manufacturer's written instructions are more stringent.
 2. Repair damaged and deteriorated concrete in accordance with resinous flooring manufacturer's written instructions.
 3. Verify that concrete substrates are dry and moisture-vapor emissions are within acceptable levels in accordance with manufacturer's written instructions.
 - a. Anhydrous Calcium Chloride Test: ASTM F1869. Proceed with application of resinous flooring only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. (1.36 kg of water/92.9 sq. m) of slab area in 24 hours.

- b. Plastic Sheet Test: ASTM D4263. Proceed with application only after testing indicates absence of moisture in substrates.
 - c. Relative Humidity Test: Use in situ probes, ASTM F2170. Proceed with installation only after substrates have a maximum 75 percent relative humidity level measurement.
4. Alkalinity and Adhesion Testing: Verify that concrete substrates have pH within acceptable range. Perform tests recommended by manufacturer. Proceed with application only after substrates pass testing.
- C. Patching and Filling: Use patching and fill material to fill holes and depressions in substrates in accordance with manufacturer's written instructions.
- 1. Control Joint Treatment: Treat control joints and other nonmoving substrate cracks to prevent cracks from reflecting through resinous flooring in accordance with manufacturer's written instructions.
- D. Resinous Materials: Mix components and prepare materials in accordance with resinous flooring manufacturer's written instructions.

3.2 APPLICATION

- A. Apply components of resinous flooring system in accordance with manufacturer's written instructions to produce a uniform, monolithic wearing surface of thickness indicated.
- 1. Coordinate application of components to provide optimum adhesion of resinous flooring system to substrate, and optimum intercoat adhesion.
 - 2. Cure resinous flooring components in accordance with manufacturer's written instructions. Prevent contamination during application and curing processes.
 - 3. Expansion and Isolation Joint Treatment: At substrate expansion and isolation joints, comply with resinous flooring manufacturer's written instructions.
- B. Primer: Apply primer over prepared substrate at manufacturer's recommended spreading rate.
- C. Integral Cove Base: Apply cove base mix to wall surfaces before applying flooring. Apply in accordance with manufacturer's written instructions and details, including those for taping, mixing, priming, troweling, sanding, and topcoating of cove base. Round internal and external corners.
- 1. Integral Cove Base: 4 inches (100 mm) high.
- D. Self-Leveling Body Coats: Apply self-leveling slurry body coats in thickness indicated for flooring system.
- 1. Aggregates: Broadcast aggregates at rate recommended by manufacturer and, after resin is cured, remove excess aggregates to provide surface texture indicated.
- E. Troweled or Screeded Body Coats: Apply troweled or screeded body coats in thickness indicated for flooring system. Hand or power trowel and grout to fill voids. When body coats are cured, remove trowel marks and roughness using method recommended by manufacturer.
- F. Topcoats: Apply topcoats in number indicated for flooring system and at spreading rates recommended in writing by manufacturer and to produce wearing surface indicated.

3.3 FIELD QUALITY CONTROL

- A. Material Sampling: Owner may, at any time and any number of times during resinous flooring application, require material samples for testing for compliance with requirements.
1. Owner will engage an independent testing agency to take samples of materials being used. Material samples will be taken, identified, sealed, and certified in presence of Contractor.
 2. Testing agency will test samples for compliance with requirements, using applicable referenced testing procedures or, if not referenced, using testing procedures listed in manufacturer's product data.
 3. If test results show applied materials do not comply with specified requirements, pay for testing, remove noncomplying materials, prepare surfaces coated with unacceptable materials, and reapply flooring materials to comply with requirements.

3.4 PROTECTION

- A. Protect resinous flooring from damage and wear during the remainder of construction period. Use protective methods and materials, including temporary covering, recommended in writing by resinous flooring manufacturer.

END OF SECTION 096723

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