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:

1. High-performance resinous flooring systems.

B. Related Sections:

1. Section 079200 "Joint Sealants" for sealants installed at joints in resinous flooring systems.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product indicated. Include manufacturer's technical data, application instructions, and recommendations for each resinous flooring component required.

B. Samples for Initial Selection: For each type of exposed finish required.

C. Samples for Verification: For each resinous flooring system required, 6 inches (150 mm) square, applied to a rigid backing by Installer for this Project.

D. Product Schedule: For resinous flooring.

1.4 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.

1.5 CLOSEOUT SUBMITTALS

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

1.6 QUALITY ASSURANCE

A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of flooring systems required for this Project.

1. Engage an installer who is certified in writing by resinous flooring manufacturer as qualified to apply resinous flooring systems indicated.

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

C. Mockups: Apply 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 48-inch- (1200-mm-) square floor area selected by Architect.

a. Include 48-inch (1200-mm) length of integral cove base with inside and outside corner.

2. Simulate finished lighting conditions for Architect's review of mockups.
3. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

D. Preinstallation Conference: Conduct conference at Project site.

E. Concrete Substrates: Verify that concrete slabs comply with ASTM F 710 and the following:
1. Slab substrates are dry and free of curing compounds, sealers, hardeners, and other materials that may interfere with adhesive bond. Determine adhesion and dryness characteristics by performing bond, moisture, and pH tests recommended in writing by flooring manufacturer.
a. Moisture Content of Slab: 3 pounds per 1,000 sq.ft. or less per RMA test method.

1.7 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.

1.8 PROJECT 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 not less than 24 hours after application unless manufacturer recommends a longer period.

D. Do not install the Work of this Section outside of the following environmental ranges with Manufacturers' written acceptance:

1. Material Temperature: Precondition material for at least 24 hours between 65° to 75°F (18° to 24°C)
2. Ambient Temperature: Minimum/Maximum 50˚/85˚F (10˚/30˚C)
3. Substrate Temperature: Minimum/Maximum 50˚/85˚F (10˚/30˚C). Substrate temperature must be at least 5˚F (3˚C) above measured Dew Point.
4. Mixing and Application attempted at Material, Ambient and/or Substrate Temperature conditions less than 65˚F (18˚C) will result in a decrease in product workability and slower cure rates.
5. Relative Ambient Humidity: Minimum ambient humidity 30%, maximum ambient humidity 75% (during application and curing)
6. Measure and confirm Substrate Moisture Content, Ambient Relative Humidity, Ambient and Surface Temperature and Dew Point.

E. Substrate moisture:
1. Moisture content of concrete substrate must be ≤ 4% by mass as measured with a Tramex® CME/CMExpert type concrete moisture meter.
2. Additionally, relative humidity tests may be conducted per ASTM F2170 and values must be ≤ 85%.
3. If moisture content of concrete substrate is > 4% by mass as measured with Tramex® CME/CMExpert type and/or if relative humidity tests per ASTM F2170 exceed values > 85%, consider moisture mitigation systems or moisture tolerant primer.

F. Utilities, including electric, water, HVAC and permanent lighting to be supplied by General Contractor

G. Maintain constant ambient room temperature of plus or minus 15ºF (plus or minus 7ºC) with a minimum temperature of 50ºF (10ºC) and maximum temperature of 85ºF (30ºC). Maintain constant ambient room temperature for 48 hours before, during and after installation, or until cured. Do not apply while ambient and temperatures are rising.

H. Erect suitable barriers and post legible signs at points of entry to prevent traffic and trades from entering the work area during application and cure period of the floor.

I. Protection of finished floor from damage by subsequent trades shall be the responsibility of the General Contractor.

J. Insure adequate ventilation and air flow.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis-of-Design Product: Subject to compliance with requirements, provide Sika Corporation; Sikafloor Morritex Coating System, or comparable product by one of the following:

1. Stonhard, Inc.
2. Prime Polymers, Inc.

2.2 HIGH-PERFORMANCE RESINOUS FLOORING (Kitchen)

A. Resinous flooring system: Sikafloor 22NA PurCem is a self-leveling, medium to heavy duty, solid color, three-component, water dispersed polyurethane-based/cement and aggregate screed. Typically applied between 3/16 to 1/4 in (4.5 to 6 mm) thick. System to consist of the following components:

B. Primer: Substrate priming is normally not required under typical circumstances. Substrate porosity/condition determines if primer/scratch coat is required

C. Self-Leveling Mortar: Sikafloor 22NA PurCem Traffic Grey applied between 3/16” – 1/4”.

D. Top Coat: Sikafloor 510LPL 15 mils. Color: Traffic Grey

E. Materials:
1. Primer: Substrate priming is normally not required under typical circumstances. Substrate porosity/condition determines if primer/scratch coat is required
2. Self-Leveling Mortar: Sikafloor-22NA PurCem is a self-levelling, medium to heavy duty, solid color, three-component, water dispersed polyurethane-based / cement and aggregate screed. It is designed to provide excellent resistance to abrasion, impact, chemical attack and other physical aggression. Sikafloor-22NA has the following properties:
   a. Softening Point: 266°F (130°C)
   b. Density (ASTM C905): 16.84 lb./US gal. (2.02 kg/L)
   c. Flow: Approx. 11.8 in (300 mm)
   d. Service Temperature: - 40°F (- 40°C) min. / 212°F (100°C) max.
   e. Compressive Strength (ASTM 579)

24 hrs	3,191 psi (22 MPa)
7 days	5,366 psi (37 MPa)
28 days	5,802 psi (40 MPa)

   f. Tensile Strength (ASTM C307): 1,045 psi (6.5 MPa)
   g. Flexural Strength (ASTM C580): 2,314 psi (14.7 MPa)
   h. Pull-off Strength (ASTM D4541): > 254 psi (> 1.75 MPa) (substrate failure)
   i. Thermal Compatibility (ASTM C884): Pass
   j. Shore D Hardness (ASTM D2240): 80 - 85
   k. Indentation (MIL -PRF -24613): ~ 0%
   l. Impact Resistance (ASTM D2794): 5.02 ft - lb (6.81 joules)
   m. at 1/8” (3 mm) of thickness

n. Abrasion Resistance (ASTM D4060): CS-17/1,000 cycles/2.2 lb (1,000 g) -0.0052 oz (-0.110 g)
H-22/1,000 cycles/2.2 lb (1,000 g) -0.080 oz (-2.26 g)
o. Coefficient of Friction (ASTM D1894-61T): Steel 0.3 Rubber 0.5
p. Coefficient of Thermal Expansion (ASTM D696): 0.89 x 10-5 in/in/ºF (1.6 x 10-5 mm/mm/ºC)
q. Water Absorption (ASTM C413): 0.10%
r. Flexural Modulus (ASTM C580): 629,025 psi (4,335.7 MPa)
s. Resistance to Fungi Growth (ASTM G21): Rated 0 (no growth)
t. Resistance to Mold Growth (ASTM D3273): Rated 10 (highest resistance)
u. VOC's Components A+B+C: < 5 g/L

3. Broadcast Aggregate: 40-60 mesh silica to rejection.

4. Top Coat: Sikafloor 510 is a two-component, solvent-free, high solids, low-viscosity, high strength, polyaspartic resin system pigmented to Traffic Grey with the following properties:
a. Pull-off Strength (ASTM D1583): > 400 psi (2.7 MPa) with 100% concrete failure.
b. Shore D Hardness (ASTM D2240): 75.
c. VOC Content (ASTM D2369): ≤ 50 g/L.
d. Viscosity (approximately) of Components A + B: 850 cps.
e. Tensile Strength (ASTM C307): 6,500 psi.
f. Coefficient of Friction (ASTM D1894): 61T 0.8.
g. Thermal Compatibility (ASTM C884): Pass

2.3 ACCESSORIES

A. Primer: Type recommended by manufacturer for substrate and body coats indicated.

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

PART 3 - EXECUTION

3.1 PREPARATION FOR KITCHEN

A. Prepare surface to receive flooring systems in accordance with manufacturer's written instructions.

B. Remove dirt, oil, grease, wax, laitance, curing compounds, water-soluble concrete hardeners, and other surface contaminants. Remove sealers, finishes, and paints. Remove unsound concrete by appropriate mechanical means.

C. Concrete: Shall be cleaned and prepared to achieve laitance-free and contaminant-free, open textured surface by shot blasting or equivalent mechanical means (CSP level as per ICRI guidelines and manufacturer's written recommendation).

D. Chemical Surface Preparation: Chemical surface preparation (acid etching) is unacceptable and will void Manufacturer's warranty.

E. Control joints and cracks: Provide repair and treatment of control joints and surface cracks utilizing manufacturer's standard materials and installation details.

3.2 PREPARATION

A. General: Prepare and clean substrates according to 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 C 811 requirements unless manufacturer's written instructions are more stringent.

2. Repair damaged and deteriorated concrete according to resinous flooring manufacturer's written instructions.
3. Verify that concrete substrates are dry and moisture-vapor emissions are within acceptable levels according to manufacturer's written instructions.

    a. Perform anhydrous calcium chloride test, ASTM F 1869. 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. Perform plastic sheet test, ASTM D 4263. Proceed with application only after testing indicates absence of moisture in substrates.
    c. Perform relative humidity test using in situ probes, ASTM F 2170. 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. Resinous Materials: Mix components and prepare materials according to resinous flooring manufacturer's written instructions.

D. Use patching and fill material to fill holes and depressions in substrates according to manufacturer's written instructions.

E. Treat control joints and other nonmoving substrate cracks to prevent cracks from reflecting through resinous flooring according to manufacturer's written instructions.

3.3 KITCHEN APPLICATION

A. Mix and apply material with strict adherence to manufacturer’s written installation procedures and coverage rates.

B. Follow Manufacturer’s written recommendations on terminations and connections to walls, drains, doorways, columns and floor-to-floor transitions.

C. Do not apply while ambient and substrate temperatures are rising.

D. Apply resinous flooring with care to ensure that no laps, voids, or other marks or irregularities are visible, and with an appearance of uniform color, sheen and texture, all within limitations of materials and areas concerned.

E. Match colors and textures of approved samples.

F. Install cove base 6 inches high with ¾ inch radius in accordance with manufacturer’s written instructions.

3.4 APPLICATION - GENERAL

A. General: Apply components of resinous flooring system according to 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 according to manufacturer's written instructions. Prevent contamination during application and curing processes.
3. At substrate expansion and isolation joints, comply with resinous flooring manufacturer's written instructions.

B. 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 according to 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. Apply self-leveling slurry body coats in thickness indicated for flooring system.

1. Broadcast aggregates at rate recommended by manufacturer and, after resin is cured, remove excess aggregates to provide surface texture indicated.

E. Apply troweled or screeded body coats in thickness indicated for flooring system. Hand or power trowel and grout to fill voids. When cured, remove trowel marks and roughness using method recommended by manufacturer.

F. Follow Manufacturer's written recommendations on terminations and connections to walls, drains, doorways, columns and floor-to-floor transitions.

G. Do not apply while ambient and substrate temperatures are rising.

H. Apply resinous flooring with care to ensure that no laps, voids, or other marks or irregularities are visible, and with an appearance of uniform color, sheen and texture, all within limitations of materials and areas concerned.

I. Match colors and textures of approved samples

J. Apply grout coat, of type recommended by resinous flooring manufacturer, to fill voids in surface of final body coat and to produce wearing surface indicated.

K. Apply topcoats in number indicated for flooring system and at spreading rates recommended in writing by manufacturer.

3.5 FIELD QUALITY CONTROL

A. Core Sampling: At the direction of Owner and at locations designated by Owner, take one core sample per 1000 sq. ft. (92.9 sq. m) of resinous flooring, or portion of, to verify thickness. For each sample that fails to comply with requirements, take two additional samples. Repair damage caused by coring and correct deficiencies.

B. 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.

3.6 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.

B. Freshly applied material should be protected from dampness, condensation and water for at least 72 hrs.

C. Beware of air flow and changes in air flow. Introduction of dust, debris, and particles, etc. may result in surface imperfections and other defects.

D. Follow manufacturer's written recommendation with respect to cure, wait time and return to service.

END OF SECTION 096723

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