

SECTION 09 67 23
RESINOUS FLOORING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Fluid-applied resinous flooring applications.

1.2 RELATED REQUIREMENTS

- A. Section 07 92 00 - Joint Sealants: Sealing joints between fluid-applied flooring and adjacent construction and fixtures.
- B. Section 09 05 61 - Common Work Results for Flooring Preparation: Concrete slab moisture and alkalinity testing and remediation procedures.

1.3 REFERENCE STANDARDS

- A. ASTM C 579 - Standard Test Method for Compressive Strength of Chemical-Resistant Mortars, Grouts, Monolithic Surfacing, and Polymer Concretes
- B. ASTM C 307 - Standard Test Method for Tensile Strength of Chemical-Resistant Mortar, Grouts, and Monolithic Surfacing
- C. ASTM C 531 - Standard Test Method for Linear Shrinkage and Coefficient of Thermal Expansion of Chemical-Resistant Mortars, Grouts, Monolithic Surfacing, and Polymer Concretes
- D. ASTM C 580 - Standard Test Methods for Flexural Strength and Modulus of Elasticity of Chemical-Resistant Mortars, Grouts, Monolithic Surfacing, and Polymer Concretes
- E. ASTM D905 - Standard Test Method for Strength Properties of Adhesive Bonds in Shear by Compression Loading; 2008 (Reapproved 2013)
- F. ASTM D2794 - Standard Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact); 2019
- G. ASTM D4060 - Standard Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser; 2014.
- H. ASTM E96/E96M - Standard Test Methods for Water Vapor Transmission of Materials; 2016.
- I. ASTM D 2047 - Standard Test Method for Static Coefficient of Friction of Polish-Coated Flooring Surfaces as Measured by the James Machine
- J. ASTM D 4541 - Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers
- K. ASTM F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride; 2016
- L. ASTM F2170 - Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes; 2017
- M. ICRI 310.2R - Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, Polymer Overlays, and Concrete Repair; 2013

1.4 SUBMITTALS

- A. See Section 01 33 00 - Submittal Procedures.
- B. Product Data: Provide data on specified products, describing physical and performance characteristics; sizes, patterns and colors available.
- C. Samples: Submit two samples, 12 by 12 inches in size illustrating color and pattern for each floor material for each color specified.
- D. Concrete Subfloor Test Report: Submit a copy of the moisture and alkalinity (pH) test reports.
- E. Field Quality Control Reports: Submit a copy of the Temperature and Coverage Rate reports.
- F. Manufacturer's Installation Instructions: Indicate special procedures.
- G. Manufacturer's Qualification Statement.
- H. Applicator's Qualification Statement.
- I. Maintenance Data: Include maintenance procedures, recommended maintenance materials, procedures for stain removal, repairing surface, and suggested schedule for cleaning.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum seven years documented experience.
- B. Applicator Qualifications: Company specializing in performing the work of this section.
 - 1. Minimum five years of documented experience.
 - 2. Approved by manufacturer.

1.6 PRE-INSTALLATION CONFERENCE AND MOCK-UP

- A. Review requirements for flooring products and installation, including surface preparation, substrate conditions, expansion joints, and manufacturer details, installation procedures, mock ups, testing and inspection requirements, protection and repairs, and coordination and sequencing of waterproofing work with the work of related Divisions.
- B. Construct mock-up(s) of fluid applied flooring to serve as basis for evaluation of texture, slip resistance and workmanship.
 - 1. Number of Mock-Ups to be Prepared: One.
 - 2. Use same materials and methods for use in the work.
 - 3. Use approved design samples as basis for mock-ups.
 - 4. Locate where directed.
 - 5. Minimum Size: 48 inches by 48 inches.
- B. See Section 01 40 00 - Quality Control for additional requirements.
- C. Approved mock-up may remain as part of the Work.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store resin materials in a dry, secure area.
- B. Store materials for three days prior to installation in area of installation to achieve temperature stability.

1.8 FIELD CONDITIONS

- A. Store materials in area of installation for minimum period of 24 hours prior to installation.

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- B. Maintain ambient temperature required by manufacturer 72 hours prior to, during, and 24 hours after installation of materials.

1.9 WARRANTY

- A. Manufacturer's warranty covering the fluid-applied flooring against defects in materials for a minimum of one year from date of installation.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Fluid-Applied Resinous Flooring:
 - 1. Basis of Design: TREMfloor tm Urethane Cement SL with broadcast and TREMfloor tm Urethane Cement FCUV sealer: a seamless self-leveling slurry-broadcast antimicrobial treated cementitious urethane floor system with a AUV stable finish coat.

2.2 FLUID-APPLIED RESINOUS FLOORING SYSTEM

- A. System Materials:
 - 1. Topping: TREMfloor tm Urethane Cement SL Base A, TREMfloor tm Urethane Cement Hardener B, TREMfloor tm Cement SL Filler C and a pigment pack. TREMfloor tm Urethane Cement SL is supplied with Polygiene anti-microbial additive.
 - 2. Broadcast Aggregate: 20-40 mesh silica sand.
 - 3. Topcoat: TREMfloor tm Urethane Cement FCUV Base A, TREMfloor tm Urethane Cement FCUV Hardener B, TREMfloor tm Urethane Cement FCUV Filler C, and a pigment pack. TREMfloor tm Urethane Cement FCUV is supplied with Polygiene anti-microbial additive.
- B. Patch Materials:
 - 1. Shallow Fill and Patching: TREMfloor tm Urethane Cement SR (up to ¼").
 - 2. Deep Fill and Sloping Material (over ¼"): TREMfloor Urethane Cement HF.
- C. Product Requirements
 - 1. Topping: Tremco, Inc., TREMfloor tm Urethane Cement SL
 - a. Percent Solids: 100%
 - b. VOC: <10g/L
 - c. Bond Strength to Concrete ASTM D 4541: >400 psi, failure in substrate
 - d. Compressive Strength, ASTM C 579: > 7,250 psi
 - e. Flexural Strength, ASTM C 580: 2,900 psi
 - f. Impact Resistance @ 125 mils, MIL D-3134: 160 inch lbs, no visible damage or deterioration
 - 2. Topcoat: TREMfloor tm Urethane Cement FCUV
 - a. Percent Solids: 100%
 - b. VOC: <10 g/L
 - c. Compressive Strength, ASTM D579: 7,00 psi
 - d. Tensile Strength, ASTM C307: 1,500 psi
 - e. Flexural Strength, ASTM C580: 1,200 psi
 - b. Deep Fill and Sloping Material (over ¼ inch): Dur-A-Flex, Inc. Poly-Crete WR or Dur-A-Tex UM

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that subfloor surfaces are smooth and flat within the tolerances specified for that type of work and are ready to receive flooring.
- B. Verify that subfloor and wall base surfaces are dust-free and free of substances that could impair bonding of materials to subfloor surfaces.
- C. Cementitious Subfloor Surfaces: Verify that substrates are ready for fluid-applied resinous flooring installation by testing for moisture and alkalinity (pH).
- D. Verify that required floor-mounted utilities are in correct location.

3.2 PREPARATION

- A. All concrete surfaces shall be free of laitance, oil, grease, curing compounds, loose particles, friable matter, dirt, bituminous products, and all other contaminants.
- B. Moisture Testing: Perform vapor emission (calcium chloride) test in accordance with ASTM F 1869-10.
 - a. Perform three tests for the first 1,000 sq ft and then one test per subsequent 1,000 sq ft.
 - b. Application will proceed only when the vapor/moisture emission rates from the slab does not exceed 12 lbs/1,00 sq ft/24 hrs.
 - c. If the vapor drive exceeds 12 lbs/1,000 sq ft/24 hrs then the Owner and Architect shall be notified and advised for the possible installation of a vapor mitigation system that has been approved by the manufacturer or means to lower the value to the acceptable limit.
- C. Mechanical surface preparation:
 - a. Shot blast all surfaces to receive flooring system with a mobile steel shot, dust recycling machine (Blastrac or equal). All surface and embedded accumulations of paint, toppings hardened concrete layers, laitance, power trowel finishes, and other similar surface characteristics shall be completely removed leaving a bare concrete surface having a minimum profile of CSP 4-5 as described by the International Concrete Repair Institute.
 - b. Floor areas inaccessible to the mobile blast machines shall be mechanically abraded to the same degree of cleanliness, soundness and profile using diamond grinders, needle guns, bush hammers, or other suitable equipment.
 - c. Where the perimeter of the substrate to be coated is not adjacent to a wall or curb, a minimum of ¼" key cut shall be made to properly seat the system, providing a smooth transition between areas. The detail cut shall also apply to drain perimeters and expansion joint edges.
 - d. Cracks and joints (non-moving) greater than 1/8" wide are to be chiseled or chipped-out and repaired per manufacturer's recommendations.
 - e. At spalled or worn areas, mechanically remove loose or delaminated concrete to sound concrete and patch per manufacturer's recommendations.

3.3 INSTALLATION - FLOORING

- A. General:
 - 1. The system shall be applied in two distinct steps

- a. Substrate preparation
 - b. Topping application with aggregate broadcast
 - c. Topping application
2. Immediately prior to the application of any component of the system, the surface shall be dry, and any remaining dust or loose particles shall be removed using a vacuum machine, or clean-dry with oil-free compressed air.
 3. The handling, mixing and addition of components shall be performed in a safe manner to achieve the desired results in accordance with the manufacturer's recommendations.
 4. The system shall follow the contour of the substrate unless pitching or other leveling work has been specified by the architect.
 5. A neat finish with well-defined boundaries and straight edges shall be provided by the applicator.

B. Topping:

1. The topping shall be applied as a trowel applied system. The topping shall be applied in one lift with a nominal thickness of 3/16".
2. The topping shall be comprised of four components, Base A, Hardener B, pigment pack, and Filler C as supplied by manufacturer.
3. The pigment pack shall be added to the Base and thoroughly dispersed then the Hardener shall be added to the Base and pigment and be thoroughly mixed by suitably approved mechanical means. TREMfloor tm Urethane Cement SL Filler C shall then be added to the mixing vessel and mixed in a manner to achieve a homogenous blend.
4. The topping shall be applied over horizontal surfaces using a screed box, then compact and finish with a trowel. In smaller areas or where access is limited, the mortar can be spread using a trowel.
5. Immediately upon placing, the topping shall be lightly rolled with a loop roller.
6. Mesh Silica sand aggregate shall be broadcast to refusal into the wet material at the rate of 1 lbs/sq ft.
7. Allow material to cure. Vacuum, sweep and/or blow to remove all loose aggregate.

C. Topcoat:

1. The topcoat shall be mixed and applied per the manufacturer's recommended procedure.
2. The topcoat shall be comprised of four components: TREMfloor tm Urethane Cement FCUV Base A, FCUV Hardener B, FCUV Filler C, and a pigment pack supplied by the manufacturer.
3. The pigment pack shall be added to the Base and thoroughly dispersed before adding Hardener B and mix for the recommended amount of time. While mixing add FCUV Filler C to the Mixture.
4. The topcoat is applied at the rate of 230 sq ft per kit. Apply a thin layer using a rubber notch squeegee.
5. Back roll the applied FCUV sealer with a ¼" or 3/8" contractor grade nap mohair roller. Change the nap roller every 800 sq ft to avoid the activation of the resin in the roller.

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6. Use a paint brush or mini roller to ensure boards, edges, and corners are sealed appropriately.

7. The finished floor will have a nominal thickness of 3/16"

3.4 FIELD QUALITY CONTROL

A. Tests, Inspection.

1. The following tests shall be conducted by the applicator:

a. Temperature

1. Air, substrate temperatures and, if applicable, dew point.

b. Coverage Rates

1. Application rate shall be monitored by checking quantity of material used against Covered area.

2. Where applicable, inspect transitional material such as expansion joints, and flashings.

3.5 CLEANING AND PROTECTING

A. Cure flooring material in compliance with manufacturer's directions, taking care to prevent the contamination during stages of application and prior to completion of the curing process.

B. Remove masking. Perform detail cleaning at floor system application termination, to leave a clean surface for subsequent work of other divisions.

END OF SECTION