

SECTION 09 67 23

RESINOUS EPOXY HEAVY DUTY FLOOR TOPPING

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Epoxy floor toppings, specifically a resin rich epoxy slurry.

B. Related Sections: Section(s) related to this section include:

1. Concrete Substrates: Division 3 Concrete Sections.

1.02 SYSTEM DESCRIPTION

A. Performance Requirements: Provide resinous flooring that has been manufactured and installed to maintain performance criteria stated by manufacturer without defects, damage or failure.

1.03 SUBMITTALS

A. General: Submit listed submittals in accordance with Conditions of the Contract and Division 1 Submittal Procedures Section.

B. Product Data: Submit product data, including manufacturer's Technical Data product sheet, for specified products, and manufacturer's installation instructions.

C. Samples: Submit selection and verification samples for finishes, colors and textures.

1.04 QUALITY ASSURANCE

A. Qualifications:

1. Installer Qualifications: Installer experienced in performing work of this section who has specialized in installation of work similar to that required for this project.

a. Installer shall be an established company with at least 3 years of experience in the installation of polymer floors.

b. Contractor shall demonstrate the ability to undertake and complete the required work and furnish documentation regarding the successful completion of projects of similar size and complexity.

2. Manufacturer Qualifications: Manufacturer shall be capable of providing technical support, qualified applicators, and an approval of application methods.

B. Preinstallation Meetings: Conduct a preinstallation meeting to verify flooring system specifications (color, texture, etc.), substrate analysis, and manufacturer's installation instructions.

C. Preinstallation Testing: Conduct preinstallation testing as follows:

1. Water Vapor Transmission: Calcium Chloride tests should be conducted to determine the amount of water vapor coming through the slab. The results should be compared to limitations set forth by the manufacturer.

2. Core Sample Testing: (optional) Core samples should be taken and analyzed if the installer believes there to be a problem with the integrity of the substrate that may affect flooring system performance.

1.05 DELIVERY, STORAGE & HANDLING

A. General: Comply with Division 1 Product Requirements Sections.

B. Ordering: Comply with Manufacturer's ordering procedures and allow for enough lead-time for custom blends so as not to interfere with construction schedules.

C. Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.

D. Storage and Protection: Store materials where they are protected from direct sunlight and harmful weather conditions. Meet manufacturer's condition for temperature, humidity, etc.

1.06 PROJECT CONDITIONS

A. Environmental Requirements/Conditions: Substrate and ambient air temperature shall be in accordance with manufacturer's requirements.

B. Temperature Requirements: Maintain air temperature in spaces where products will be installed for time period before, during and after installation as recommended by manufacturer.

1.07 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 (including substrata) for both material and workmanship for a 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. American Society for Testing and Materials (ASTM):

B221-08.....Standard Specification for Aluminum and
Aluminum-Alloy Extruded Bars, Rods, Wire,
Profiles, and Tubes

C307-03 (2008).....Standard Test Method for Tensile Strength of
Chemical-Resistant Mortar, Grouts, and
Monolithic Surfacing

C413-01(2006).....Standard Test Method for Absorption of
Chemical-Resistant Mortars, Grouts, Monolithic
Surfacings and Polymer Concretes

C531-00(2005).....Standard Test Method for Linear Shrinkage and
Coefficient of Thermal Expansion of Chemical-
Resistant Mortars, Grouts, Monolithic
Surfacings, and Polymer Concretes

C579-01(2006).....Standard Test Method for Compressive Strength
of Chemical-Resistant Mortars, Grouts,
Monolithic Surfacing, and Polymer Concretes

C580-02(2008).....Standard Test Method for Flexural Strength and
Modulus of Elasticity of Chemical-Resistant
Mortars, Grouts, Monolithic Surfacing, and
Polymer Concretes

C811-98(2008).....Standard Practice for Surface Preparation of
Concrete for Application of Chemical-Resistant
Resin Monolithic Surfacing

D1308-02(2007).....Standard Test Method for Effect of Household
Chemicals on Clear and Pigmented Organic
Finishes

D2047-04Standard Test Method for Static Coefficient of
Friction of Polish-Coated Flooring Surfaces as
Measured by the James Machine

D2240-05.....Standard Test Method for Rubber Property –
Durometer Hardness

D4060-07.....Standard Test Method for Abrasion Resistance of
Organic Coatings by the Taber Abraser

D4226-09.....Standard Test Methods for Impact Resistance of
Rigid Poly(Vinyl Chloride) (PVC) Building
Products

- D7234-05.....Standard Test Methods for Pull-Off Adhesion
Strength of Coatings on Concrete Using Portable
Pull-Off Adhesion Testers
- F1869-09.....Standard Test Method for Measuring Moisture
Vapor Emission Rate of Concrete Subfloor Using
Anhydrous Calcium Chloride
- F2170-09.....Standard Test Method for Determining Relative
Humidity in Concrete Floor Slabs Using in situ
Probes
- C. National Association of Architectural Metal Manufacturers (NAAMM):
AMP 501.....Finishes for Aluminum

PART 2 PRODUCTS

2.1 SYSTEM DESCRIPTION FOR RES-6A (HEAVY DUTY CLIMATIC)

A. System Descriptions:

1. Monolithic, multi-component urethane chemistry resinous flooring system, Screed and steel finish trowel applied, chemical and thermal cycling and shock resistant. Self priming multiple component polyurethane mortar, quartz aggregates for texture and associated high performance urethane sealer. Temperature resistance to 250 degrees F (121 degrees C) where required.

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 mortar base product, build up layers of broadcast systems will not be accepted. Verify compatibility with substrate. Use manufacturer's standard components, compatible with each other and as follows:

Physical Properties

Components 2 (supplied, plus silica)

Mix Ratio (A:B) 2:1

Solids 100%

Packaging 15 gallon kit (2) 5 gal A/5 gal B

150 gallon kit (2) 50 gal A/50 gal B

Coverage 1/8" 35 sq. ft./gallon

1/4" 17.5 sq. ft./gallon

Application Temperature 65°F-90°F

Viscosity (mixed) 800 cps

Pot Life (8 oz @ 72°F) 40 minutes

Working Time (72°F) 35 minutes

Cure Time 6 hours (foot traffic)

6-24 hours (recoat)

Flash Point Part A: >200°F

Part B: >200°F

Shelf Life 12 months

USDA: Food and Beverage Meets requirements.

Performance Properties

Adhesion >250 psi (concrete fails)

(ASTM D-4541)

Compressive Strength 13,300 psi

(ASTM D-695)

Flexural Strength 6,200 psi

(ASTM D-790)

Tensile Strength 3,100 psi

(ASTM D-638)

Hardness 84 Shore D

(ASTM D-2240)

Maximum Service Temperature 165°F

PART 3 - EXECUTION

3.1 INSPECTION

- A. Examine the areas and conditions where monolithic resinous (urethane and epoxy mortar) flooring system with integral base is to be installed with the VA Resident Engineer.
- B. Moisture Vapor Emission Testing: Perform moisture vapor transmission testing in accordance with ASTM F1869 to determine the MVER of the substrate prior to commencement of the work. See section 3.4, 3.

3.2 PROJECT CONDITIONS

- A. Maintain temperature of rooms (air and surface) where work occurs, between 70 and 90 degrees F (21 and 32 degrees C) for at least 48 hours, before, during, and 24 hours after installation. Maintain temperature at least 70 degrees F (21 degrees C) during cure period.
- B. Maintain relative humidity less than 75 percent.
- C. Do not install materials until building is permanently enclosed and wet construction is complete, dry, and cured.
- D. Maintain proper ventilation of the area during application and curing time period.
 - 1. 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 reviewed with the VA Resident Engineer for the seamless resinous (urethane and epoxy mortar) flooring system with integral cove base.
- B. Substrate shall be approved by manufacture technical representative.

3.4 PREPARATION

- A. General: Prepare and clean substrates according to resinous flooring manufacturer's written instructions for substrate indicated. Provide clean, dry, and neutral Ph 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. Prepare 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. Use of acids is never allowed.
 - 2. Repair damaged and deteriorated concrete according to resinous flooring manufacturer's written recommendations.
 - 3. Verify that concrete substrates are dry.
 - a. Perform anhydrous calcium chloride test, ASTM F 1869.
 - b. MVT threshold for monolithic resinous Non - climatic flooring shall not exceed 5 lbs/1000 square feet (0.0001437 kPa) in a 24 hour period. MVT threshold for monolithic resinous climatic flooring shall not exceed 6 lbs/1000 square feet (0.0002155 kPa) over a 24 hour period.
 - c. When MVT emission exceeds this limit, apply manufacturer's recommended vapor control primer or other corrective measures as recommended by manufacturer prior to application of flooring or membrane systems.
 - d. Perform in situ probe test, ASTM F2170. Proceed with application only after substrates do not exceed a maximum potential equilibrium relative humidity of 75-80 percent.
 - a. Provide a written report showing test placement and results.
 - 4. Verify that concrete substrates have neutral Ph and that resinous flooring will adhere to them. 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 recommendations. Allowances should be included for flooring manufacturer recommended joint fill material, and concrete crack treatment.
- F. Prepare wall to receive integral cove base and trench liner:
 - 1. Verify wall material is acceptable for resinous flooring application, if not, install material (e.g. cement board) to receive base.
 - 2. Fill voids in wall surface to receive base, install undercoats (e.g. water proofing membrane, and/or crack isolation membrane) as recommended by resinous flooring manufacturer.
 - 3. Install base and trench liner prior to flooring if required by resinous flooring manufacturer.
 - 4. Grind, cut or sand protrusions to receive base application.

3.5 APPLICATION

- 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, provide joint in resinous flooring to comply with resinous flooring manufacturer's written recommendations.
 - a. Apply joint sealant to comply with manufacturer's written recommendations.
- B. Apply Primer: over prepared substrate at manufacturer's recommended spreading rate.
- C. Apply cove base: Trowel to wall surfaces at a 1 inch radius, before applying flooring. Apply according to manufacturer's written instructions and details including those for taping, mixing, priming,

and troweling, sanding, and top coating of cove base. Round internal and external corners.

- D. Trowel mortar base: Mix mortar material according to manufacturer's recommended procedures. Climatic and non-climatic resinous flooring systems may vary slightly on mode of application. Application should be based upon the following: Uniformly spread mortar over substrate using a specially designed screed box adjusted to manufacturer's recommended height. Metal trowel (hand or power) single mortar coat in thickness indicated for flooring system, grout to fill substrate voids. When cured, sand to remove trowel marks and roughness
- E. Topcoat: Mix and roller apply the topcoat(s) with strict adherence to manufacturer's installation procedures and coverage rates.

3.6 TOLERANCE

- A. From line of plane: Maximum 1/8 inch (3.18 mm) in total distance of flooring and base.
- B. From radius of cove: Maximum of 1/8 inch (3.18 mm) plus or 1/16-inch (1.59 mm) minus.

3.7 CURING, PROTECTION AND CLEANING

- A. Cure resinous flooring materials 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 for a minimum of 24 hours.
- C. Protect resinous flooring materials from damage and wear during construction operation.
 - 1. Cover flooring with kraft type paper.
 - 2. Optional 6 mm (1/4 inch) thick hardboard, plywood, or particle board where area is in foot or vehicle traffic pattern, rolling or fixed scaffolding and overhead work occurs.
- D. Remove temporary covering and clean resinous flooring just prior to final inspection. Use cleaning materials and procedures recommended by resinous flooring manufacturer.

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