

Moisture Tolerant, Abrasion Resistant Thin Film Resinous Flooring System

SECTION 09 67 23

1. PART 1 – GENERAL

1.1. SUMMARY

- A This Section includes a complete thin film system with increased abrasion resistance and unlimited moisture tolerance. The work includes the following:
 - 1. Surface preparation and joint and crack treatment.
 - 2. Application of an unlimited moisture control system.
 - 3. Installation of a high traffic resinous flooring system.
- B Related Sections include the following:
 - 1. Division 03 Section "Cast-in-Place Concrete" for concrete substrates to receive resinous flooring.
 - 2. Division 03 Section "Concrete Toppings" for concrete toppings applied over base concrete slabs to receive resinous flooring.
 - 3. Division 07 Section "Joint Sealants" for joint-sealant materials and installation of sealant materials at joints in resinous flooring systems.
 - 4. Division 09 Section "Resinous Flooring" for decorative interior abrasion resistant floor finishes.

1.2. SYSTEM DESCRIPTION

- A General: The coating system consist of an unlimited moisture tolerant primer and body coat with zero VOC's and a high traffic urethane topcoat with 100 grams per liter or less.
 - 1. Appearance: The finish floor coating system shall be uniform in color, texture and appearance.
 - 2. Edge Termination: The finish floor topping system shall be uniform in color, texture and appearance. Edges that terminate at walls, floor discontinuities and other embedded items shall be uniform with no thick or ragged edges. Exterior corners shall be rounded.
 - 3. Performance of Finished Flooring System:
 - a. Water absorption: No greater than 0.04 weight percent in accordance with ASTM D570.
 - b. Compressive strength: **13,500** psi minimum in accordance with ASTM **C-579**.
 - c. Tensile Strength (ASTM C-307).....2,250 psi
 - d. Flexural Strength (ASTM C-580).....4,000 psi
 - e. Hardness (Shore D) (ASTM D-2240)85–90
 - a. Bond Strength (ASTM D-4541).....425 psi
 - b. Abrasion Resistance: 18mg loss per ASTM D-4060.
 - c. Finished Resinous flooring surface should have a coefficient of friction of .65 or greater which is deemed a safe walking surface by the ADA.
 - d. Material shall be chemically resistant to a wide range of acids, alkalis, salts, fats and oils.
- B Slip Resistance: Provide finished surfaces with a verifiable slip resistance as recommended in the Americans with Disabilities Act (ADA), "Accessibility Guidelines for Buildings and Facilities (ADAAG) and as determined by the Owner and the Owner's insurance and legal counsels for slip and fall insurability and legal liability.

1.3. SUBMITTALS

- A Product Data including descriptive data and specific recommendations for surface preparation, mixing and application of materials.
- B LEED Submittal:
 - 1. Product Data for Credit EQ 4.2: For resinous flooring systems, documentation including printed statement of VOC content and chemical components.
- C Documentation listed under Quality Assurance.
- D Samples of one square foot of specified resinous topping applied to hardboard or similar backing for rigidity and handling.
- E Test Results: Indicate and interpret results of required tests including, but not limited to, bond testing, moisture testing, alkalinity, and other manufacturer recommended tests on concrete substrates. Verify compliance with requirements.
- F Installer Certificates: Signed by manufacturer certifying that installers comply with specified requirements:
 - 1. A minimum of 500,000 square foot of a flooring system equal to the basis of design installed in the last two years.
 - 2. Provide references of at least five jobs with an equal to the basis of design system installed in the last two years.
- G Maintenance data for floor coatings to include in the "Operating and Maintenance Manual" specified in Division 01. Identify substrate and type of floor coatings applied. Include recommendations for periodic inspections, cleaning, care, maintenance, and repair of floor coatings.

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1.4. QUALITY ASSURANCE

- A Manufacturer Qualifications: Only manufacturers that produce both the unlimited moisture system and the high traffic topcoat as defined by their technical literature are acceptable. Technical literature shall provide the name of the material, generic type, descriptive information, Material Safety Data Sheets (MSDS) and certified test reports showing test results that demonstrate equivalent performance based on the specified products.
- B Applicator Qualifications: Engage an experienced applicator for this project that shall be prequalified and approved by the material manufacturer at the time of project initiation. Acceptability will include judgment on equipment, history, and financial strength. The manufacturer shall not permit the application of any of its materials by untrained, non-approved personnel.
 - 1. Each approved applicator shall have been trained by the Manufacturer in all phases of surface preparation and application of the specified flooring system.
 - 2. Each approved applicator shall have five years experience of installing the specified flooring system and shall submit a list of five projects/ references as a prequalification requirement. Each of the five projects/references shall be of the same type, equal size, quantity, and magnitude to this project as a prequalification requirement. Architect reserves the option to personally inspect the projects/references to accept or reject any of the Contractors prior to bid time as a prequalification requirement.
- C Source Limitations: Obtain resinous floor coating materials, including primers, resins, hardening agents, and topcoats, through one source from a single manufacturer. Provide secondary materials, including patching and fill material, joint sealant, and repair materials from manufacturer or from source recommended by manufacturer.
- D Field Sample: Apply 200 square feet of specified resinous flooring as defined herein to an area selected by the Architect to demonstrate surface preparation, joint and crack treatment, thickness, texture, color, and standard of workmanship.
 - 1. If Architect determines that field sample does not meet requirements, reapply resinous topping until the field sample is accepted.
 - 2. Keep the accepted field sample undisturbed during construction as a standard for judging completed work. The undamaged field sample may be incorporated into the Work.
 - 3. The Owner shall determine from field samples the size and amount of non-slip aggregate required to provide the slip resistance prescribed by the Owner's insurance and legal counsels.
- E Bond Testing: Surface preparation shall be evaluated by conducting bond tests at the site prior to application of the resinous flooring system. Bond testing shall be performed in the presence of the manufacturer. At least two bond tests shall be performed in each bay. Locations of bond tests shall be documented on the record drawings and cross-referenced to the actual bond test specimen. Maintain test specimens at project office until completion of work.
- F Preconstruction Conference: Prior to commencement of work representatives of the Owner, Contractor, Construction Manager, Applicator, Manufacturer and Architect shall meet at the project site to review the testing, surface preparation and application requirements of the Work of this Section.
 - 1. Review requirements for floor coatings. Notify participants at least 3 working days before conference.
 - 2. Moisture testing is not required since the specification calls for an unlimited moisture tolerant system. No others will be accepted.

1.5. DELIVERY, STORAGE AND HANDLING

- A Deliver materials in original Manufacturer's sealed containers with all pertinent labels intact and legible.
- B Store materials in dry protected area between 25 and 90 degrees F. Keep out of direct sunlight. Protect from open flame: Keep all containers grounded.
- C Follow all Manufacturers' specific label instructions and prudent safety practices for storage and handling.

1.6. PROJECT CONDITIONS

- A Environmental Limitations:
 - 1. Material, air and surface temperatures shall be in the range of 65° to 90° F during application and cure, unless a special formulation is being used and Manufacturer has been consulted. For temperatures below 65° F consult manufacturer for cold weather temperature additives.
 - 2. Relative humidity in the specific location of the application shall be less than 85 percent and the surface temperature shall be at least 5°F above the dew point.
- 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 urethane coating application and for not less than 24 hours after application, unless manufacturer recommends a longer period.
- D Conditions required of new concrete to be coated:

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1. The concrete shall be fully cured for a minimum of 28 days prior to application of the unlimited moisture tolerant system. Curing compounds of concrete shall be accepted by the manufacturer.
2. Surface contaminants such as membranes, or other bond breakers should not be used.

1.7. WARRANTY

- A General: Warranties specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and are in addition to and run concurrent with other warranties made by the Contractor under requirements of the Contract Documents.
- B Warranty: Submit written warranty signed by floor topping manufacturer and applicator agreeing to repair or replace urethane floor toppings that do not meet requirements or that deteriorate within the warranty period indicated below. Warranty does not include deterioration or failure of floor topping due to unusual weather phenomena, failure of prepared and treated substrate, formation of new joints and cracks in excess of 1/16 inch wide, fire, vandalism, or damage caused by truck traffic or maintenance equipment.

1.8. EXTRA STOCK

- A General: Include enough material for Owner's personnel to perform repairs on an area equal to 200 square foot.

2. PART 2 – PRODUCTS

2.1. MANUFACTURERS

- A Basis-of-Design System: The design is based on "DiamondStone Diamond-VRS High Traffic Urethane System". Subject to compliance with requirements, provide either the named system or a comparable system by one of the other specified manufacturers. Comparable systems are subject to review and approval through the submittal process specified.
- B Manufacturers: Subject to compliance with requirements, provide systems by one of the manufacturers specified: DiamondStone
- C The system includes, but is not limited to, the following:
 1. Primer: Diamond-MTP water-based Low Viscosity moisture tolerant primer.
 2. Base Coat: Diamond-VRS 100% solids pigmented low viscosity resin with unlimited moisture tolerance.
 3. Smoothing Coat: Diamond Epoxy – AP Industrial epoxy.
 4. Topcoat: High Traffic Urethane Topcoat VOC's of 100 grams per liter or less, pigmented.

2.2. MATERIALS

- A System Description: Provide primer, bond coat and topcoat as follows:
 1. Primer: Solvent-free, water-based moisture tolerant resin to which a moisture tolerant curing agent is added at the job site.
 2. Base Coat: Solvent-free, 100 percent reactive, pigmented, moisture tolerant resin to which a moisture tolerant curing agent is added at the job site.
 3. Topcoats: Three component aliphatic urethane with aluminum oxide incorporated into the product during manufacture.
- B VOC Content is not to exceed 100 grams per liter.
- C Mixing: Follow manufacturer's prescribed procedures and recommendations.

3. PART 2 – EXECUTION

3.1. INSPECTION

- A General: Examine areas where installation of urethane floor coatings will occur, with Applicator and Manufacturer present, to verify that substrates and conditions are satisfactory for installation and comply with floor coating manufacturer's requirements and those specified in this Section.
- B Do not proceed with installation until unsatisfactory conditions have been corrected.
- C Protect adjacent surfaces not to be coated. Owner's equipment shall be protected from dust, cleaning solutions and flooring materials.

3.2. APPLICATION

- A Existing bolt studs need to be cut off and pounded down to an 1/16 of an inch below the surface. To be done by others.
- B Verify that concrete substrates have neutral Ph and that coating will adhere to them. Perform tests recommended by manufacturer. Proceed with application only after substrates pass testing.
- C General: Remove existing flooring if flooring exists.
- D Shot blast the surface in a brush blast manner to provide a consistent even profile of CSP 3 to CSP 4.
- E Vacuum surface.
- F Repair damaged and deteriorated concrete according to coating manufacturer's written recommendations.

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- G Do not proceed with installation until unsatisfactory conditions have been corrected.
- H Mask off adjoining surfaces not receiving floor coatings and close off deck drains and other deck penetrations to prevent spillage and migration of liquid coatings.
- I Use patching and fill material to fill holes and depressions in substrates according to manufacturer's written instructions.
- J Treat control joints and other nonmoving substrate cracks and holes to prevent cracks from reflecting through urethane coating according to manufacturer's written recommendations.
- K Apply Diamond-MTP primer over prepared substrate at a thickness of approximately 8 mils.
- L Apply Diamond-VRS base coat at a thickness of approximately 8 mils.
- M Apply Diamond Epoxy-AP smoothing coat at a thickness of 8 mils.
- N Screen Diamond- Epoxy AP with 100 mesh carbide screens to remove fallen debris during curing process and provide a mechanical bond for the topcoat.
- O Tack rag floor to clean.
- P Apply High Traffic Topcoat Urethane at a thickness of approximately 4 wet mils according to manufacturer's written instructions to produce a uniform, monolithic wearing surface.
 - 3.2.P.1. Coordinate application of components to provide optimum adhesion of urethane coating system to substrate, and optimum inter-coat adhesion.
 - 3.2.P.2. Cure coating system according to manufacturer's written instructions. Prevent contamination during application and curing processes.

3.3. FIELD QUALITY CONTROL/INSPECTION

- A Manufacturer's Installation Specialist shall be present during substrate preparation and evaluation and installation of resinous flooring system.
- B Work not acceptable to the Architect shall be corrected before consideration of final acceptance.

3.4. CLEANING

- A Remove all material splatters and other access material that on surfaces not to be coated. Remove masking and protective covers.

END OF SECTION