

## SECTION 09 61 05

### CONCRETE MOISTURE CONTROL SYSTEM FOR FLOORING

#### PART 1 – GENERAL

##### 1.1 DESCRIPTION

- A. This Section includes: Provision of concrete moisture and alkalinity control system to new and existing interior concrete surfaces scheduled to receive moisture sensitive floor coverings.
- B. Testing for concrete moisture vapor emission and alkalinity levels.
  - 1. Pre-installation testing to be conducted by Owners independent 3rd party testing lab if desired by owner or required by sealer manufacturer. Conduct testing per ASTM F-1869 and ASTM F-2170 standards.
- C. Related Sections include:
  - 1. Division 1 – LEED Requirements
  - 2. Division 9 - Flooring

##### 1.2 SUBMITTALS

- A. Product Data: Manufacturer's technical data, Safety Data Sheets, installation instructions for concrete moisture vapor control system. Electronic submittals are recommended.
- B. ASTM Standard: Product must meet ASTM F-3010-13, "Standard Practice for Two-Component Resin Based Membrane-Forming Moisture Mitigation Systems for Use Under Resilient Floor Coverings".
- C. Product must not produce harmful fumes or odors during application.
- D. Product must be water-cleanup capable. No solvents for cleanup permitted on job sites.
- E. Product must not be labeled as an environmental pollutant or be harmful to marine life.
- E. LEED Submittals:
  - 1. Credit EQ 4.2: Manufacturer's product data for moisture vapor control system including printed statement of VOC content and chemical components.
  - 2. Credit MR 2: Construction waste management. Product data or manufacturer's certificate signed by manufacturer indicating packaging material to be recyclable.
- F. Warranty: Manufacturer's limited warranty specified in this Section.

### 1.3 QUALITY ASSURANCE

- A. Source Limitations: Obtain specified products from single source manufacturer with warranty provided directly from manufacturer.
- B. Manufacturer Qualifications: Company with minimum of 10 years in producing concrete moisture vapor emission and alkalinity control products and capable of providing technical support if required during application.
  - 1. Must be a registered corporation in good standing with state law.
  - 2. Must maintain product liability insurance coverage from top-rated carrier.
  - 3. Must demonstrate excellent technical knowledge of:
    - a. Concrete substrates and placement.
    - b. Environmental conditions affecting moisture.
    - c. Substrate preparation procedures.
    - d. Moisture sealer application.
    - e. Slab surface preparation including crack and joint treatment.
    - f. Flooring compatibility and installation.
- C. Installer Qualifications: Manufacturer's certified applicator to have a minimum of 3 years of successful experience in applying concrete moisture vapor emission control systems or other polymer based coating systems and all personnel approved in writing by manufacturer.
  - 1. Provide manufacturer certified installer certificate.
  - 2. Provide job history depicting installation experience and jobs completed. Provide a minimum of 3 projects of like scope and size.
  - 3. Maintain a valid state contractor's license in good standing.
  - 4. Maintain proper insurance coverage as required.
- D. Regulatory Requirements: Comply with the rules of the governing air quality management district covering architectural coatings.
  - 1. Product shall meet all Federal, State and Local volatile organic compound (VOC) requirements applicable at the time of application.
  - 2. Product shall be capable of being installed in occupied environments without producing fumes or odors that require excessive ventilation or use of respirators.
  - 3. Product must not be classified as a Marine Pollutant or result in combustion, flammability or produce heat during catalyzing.
  - 4. Product must allow water clean-up. Jobsite solvents are not allowed.

#### 1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to job site in manufacturer's original, unopened, undamaged containers with identification labels intact.
- B. Store materials in a dry, secure area protected from exposure to harmful weather conditions and at temperature levels as recommended by manufacturer.

#### 1.5 PROJECT CONDITIONS

- A. Conduct moisture vapor emission, relative humidity and alkalinity testing within temperature and conditions as recommended per ASTM F-1869, ASTM F-2170 and ASTM F-710 standards, respectively, when required by product manufacturer, or desired by owner at their expense. Moisture levels do not dictate how product is applied.
- B. Environmental Limitations: Comply with concrete moisture vapor control system manufacturer's written instructions for substrate temperature, ambient temperature, humidity, ventilation, and other conditions affecting system installation.
- C. Close spaces to traffic during application of concrete moisture-vapor control system and for not less than 12 hours afterwards, unless manufacturer recommends longer period.

#### 1.6 WARRANTY

- A. Limited Warranty: Written warranty as provided by manufacturer for product defects which will result in secondary damages to finished flooring system. Warranty is to include replacement of finish flooring material, flooring adhesive, concrete moisture vapor control system and all associated labor costs in areas where product defects lead to secondary damage to flooring materials.

1. Warranty Period: Minimum 10 years. Coverage includes the following:

- a. Warranty to be signed by manufacturer for material defects.
- b. Warranty to be signed by certified applicator for workmanship.

### **PART 2 - PRODUCTS**

#### 2.1 CONCRETE VAPOR EMISSION CONTROL SYSTEM

- A. Products: Subject to compliance with requirements, provide one of the following Systems:
  - 1. Advanced Moisture Control, Inc., [www.vaporsafe.com](http://www.vaporsafe.com), (714) 856-8030  
Vapor Emission Control System: "Vapor-Green® FC"
- B. Moisture Vapor Control System: Two-component, resin based, membrane-forming synthetic polymer chemistry capable of meeting specified performance requirements:
  - 1. Microbial Resistance: Polymer formulation shall be resistant to the growth of mold, mildew and micro-organisms.

2. Environmental Properties: Non-corrosive, non-marine pollutant, non-flammable, water-miscible, water clean-up and shall not produce harmful fumes or vapors when in a wet mixed or unmixed state.
3. Compatibility: All floor finishes, adhesives and primers.
4. Physical properties, acceptable test methods and minimum values:
  - a. Concrete Adhesion: ASTM D-4541 Min. 500 psi
  - b. Permeability Reduction: ASTM E-96 Min. 85% Reduction
  - c. Alkali & Acid Resistance: ASTM D-1308 14pH, No effect
  - d. Volatile Organic Content: EPA Method 24 70 g/liter or less
  - e. Relative Humidity: ASTM F-2170 Resistant to 100%
  - f. Vapor Emission Reduction: ASTM F-1869 3.0 Pounds or less
5. Acrylic, latex, silicate formulations, moisture tolerant adhesives, solvent-reactive epoxy, water based materials and single-component composition products are not acceptable.

## 2.2 MOISTURE AND ALKALINITY TESTING

- A. Calcium Chloride, Relative Humidity and pH Testing kits (if required).
  1. Moisture-Vapor Emission: Prepackaged anhydrous calcium chloride test kits conforming to requirements of ASTM F-1869.
  2. Alkalinity: Concrete pH test using calibrated digital 1 – 14 wide range pH meter to determine alkalinity level in accordance with ASTM F-710.
  3. Relative Humidity: Relative humidity concrete moisture testing equipment that conforms to ASTM F-2170 standard.

## 2.3 ACCESSORY MATERIALS

- A. Cement Overlay: Portland cement-based cement compound, compatible with flooring adhesive for scheduled finish flooring material, and applied to areas as recommended by moisture control manufacturer. Gypsum based products are not acceptable. Minimum underlayment cured strength: 4000 psi.
  1. Use cement compound manufacturer recommended primer on all overlyaments or underlayments where self-leveling compounds are used.
  2. Feathering compounds used over minor imperfections such as shrinkage cracks and rough textures may not require a primer. Consult moisture sealer manufacturer and/or compound manufacturer prior to application.
  3. Direct bonding of certain types of floor covering to sealer may be permitted. Consult with moisture sealer manufacturer on requirements for surface profile and adhesive types prior to application.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Pre installation Moisture Testing: Conduct pre installation concrete moisture vapor emission, relative humidity and alkalinity testing of existing concrete slabs on all interior concrete slab areas to receive finish flooring if desired.
  - 1. Use an ICRI (International Concrete Repair Institute) certified moisture testing agency for independent 3<sup>rd</sup> party testing if required by manufacturer of moisture vapor emission and alkalinity control system or desired by owner at their expense.
- B. Examine concrete substrates, with Certified Applicator present, for compliance with requirements for installation of concrete moisture vapor and alkalinity control system. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.2 PREPARATION**

- A. Surface Preparation: Prepare concrete slab surfaces to receive system treatment by mechanical means as recommended by manufacturer of moisture control system (no exceptions). Acid etching is not allowed. The following surface preparation methods are compatible for Vapor-Green<sup>®</sup> FC moisture control products:
  - 1. Dust-free, high pressure hydro blasting using self-contained, truck mounted recovery system that extracts water and debris.
  - 2. Diamond grinding using a #20 to #40 grit stone is preferred. Profiled surface must be clean, scratch-resistant and absorbent to water.
  - 3. Shot-blasting following International Concrete Repair Institute (ICRI) profiles. Shot blast to ICRI Profile 1 to 3, depending on surface condition.
- B. Ensure Clean Surfaces: Vacuum slab surface thoroughly or use of an industrial auto-scrubber to remove any remaining dust.
- C. Crack and Joint Preparation: Use a Portland based cementitious compound for cracks and control joints. Follow specifications for treating expansion joints as recommended by cement compound product manufacturer and architect. Treat surface irregularities after application of moisture vapor emission control system with approved manufacturers cement underlayment or patching material.

### **3.3 APPLICATION**

- A. Coordinate work of Sections 09 65 00 Resilient Flooring, 09 68 16 Sheet Carpet or other applicable floor covering sections after 12 to 24 hours curing of moisture sealer or as otherwise recommended by moisture sealer manufacturer.
- B. Apply system in accordance with manufacturer's written instructions. Saturate concrete surfaces until finish is solid and opaque with no visible crowning.
  - 1. Apply vapor barrier by squeegee and roller application to saturate concrete surfaces. Back roll material until uniform.

2. Conform with manufacturer's requirements for coverage rates and application as needed to meet specified performance requirements.
- C. After application and curing of moisture-vapor control material, and post-installation moisture testing if desired, install primer and cement overlay at areas to receive resilient finish flooring materials. Install to minimum thickness required to provide a substrate suitable to receive finish flooring as necessary.

### 3.4 FIELD QUALITY CONTROL

- A. Conduct post-installation moisture testing for moisture-vapor emissions and alkalinity, if desired by Owner and at Owner's time and cost, at areas receiving concrete moisture vapor control system. Verify the following results:
1. Maximum moisture levels of 3.0 lbs per 1000 sq ft per 24 hours or less.
  2. Surface pH values at 8.0 or below.
- B. If test results do not meet specified levels when applied properly at manufacturer's recommended rates, apply additional moisture vapor emission control material or take other corrective action as recommended by manufacturer of concrete moisture vapor control system to meet requirements at no additional cost to Owner.

NOTE: When Vapor-Green FC is installed by Certified Applicator, post-testing verification is unnecessary, Manufacturer and Applicator warrant proper performance.

### 3.5 PROTECTION

- A. Protect moisture vapor control system and cementitious underlayment where installed, from damage by any source including condensation or water spillage prior to installation of finish flooring materials.

END OF SECTION 09 61 05#