## SECTION 09 61 43

#### WATER VAPOR EMISSION CONTROL SYSTEMS

#### PART 1 - GENERAL

- 1.01 DESCRIPTION
  - A. The work of this Section includes retaining and paying for an independent Testing Laboratory to perform moisture vapor emission testing on concrete slabs to receive cork tile flooring, resilient flooring, carpet, and epoxy terrazzo and for applying a vapor emission control system treatment when testing reveals vapor emission levels exceeding specified maximums.
  - B. Related Sections:
    - 1. Cork tile flooring is specified in Section 09 62 29.16.
    - 2. Resilient tile flooring is specified in Section 09 65 19.
    - 3. Epoxy-resin terrazzo flooring is specified in Section 09 66 23.16.
    - 4. Tile carpeting is specified in Section 09 68 13.

## 1.02 SUBMITTALS

- A. Product Data: Furnish product data on treatment materials proposed for use, test reports, and application instructions.
- B. Test Diagram: Prepare a moisture report of each test area. Include name of company performing the test; types of testing instruments used; floor plan of building with each test location identified; starting date, time, and beginning weight; estimate of building temperature; stopping date, time, and ending weight; and computed pounds of emission, including equations.
- C. Warranty.

### 1.03 QUALITY ASSURANCE

- A. Installer: Manufacturer's trained personnel or factory-trained authorized installer. Installer shall have a minimum of 5-years documented experience in the installation of concrete vapor emission control systems.
- B. Manufacturer: Minimum 5-years experience producing moisture vapor control emission products.
- 1.04 PROJECT CONDITIONS
  - A. Maintain temperature range of 55-deg. F. and 85-deg. F. for 72-hours prior to, during, and after application.
- 1.05 WARRANTY
  - A. Warranty failure of finish flooring system due to concrete water vapor emission to the installed system for a period of 15-years from date of Substantial Completion. Include replacement of finish flooring material, and re-application of adhesive, vapor emission control system. This warranty shall be in addition to and not a limitation of other rights the County may have against the Developer Design/Builder under the Contract Documents.
- PART 2 PRODUCTS
- 2.01 APPROVED MANUFACTURERS
  - A. Synthetics Intl. "Synthetic 30", Diamond Stone Products or approved equal.

#### 2.02 MATERIALS

- A. Material: Two-component waterborne polymer designed to penetrate concrete slabs and seal cracks, joints, and slab imperfections. The resins allow the polymers to saturate porous concrete and embed a dense, high compressive film strength within the concrete to restrict water vapor emission, alkalinity migration and 100-percent relative humidity transfer.
  - 1. Water Vapor Transmission Rate, ASTM E96:
    - a. Grains/sq. ft./hour: 0.6.
    - b. Pounds/1000-sq. ft./24-hrs: 2.0.
  - 2. Water Vapor Permeance, ASTM E96: 1.4-perm (inch-pound).
  - 3. Pull-off Concrete Adhesion, ASTM D4541: Minimum 225-psi.
  - 4. Alkali Resistance 30-day Exposure, ASTM D1308: 14pH.
  - 5. EPA Method 24 Volatile Organic Compound (VOC): 62 g/liter.
  - 6. California Department of Health Services Section 01350 Emission Testing Results: Standard Classroom & Office Space: Pass. No formaldehyde or other CREL VOCs detected.
- B. Testing Equipment: Manufacturer's standard.

## PART 3 - EXECUTION

- 3.01 EXAMINATION
  - A. Vapor Emission Testing:
    - 1. Perform pre-installation testing of the concrete slab by a calcium chloride test prior to the application of specified water vapor emission control system treatment. Testing shall be performed by a qualified testing personnel and Testing Laboratory.
    - 2. Perform three tests for the first 1,000-sq. ft. of flooring and one additional test for each additional 1,000sq. ft. of flooring. Conduct around the perimeters of the room, at columns and where moisture may be evident.
      - a. Moisture: Perform ASTM F1869 anhydrous calcium chloride testing on clean concrete slabs; free of curing, sealing, adhesive residue, water and surface contaminates in a area 20-inches by 20-inches 24-hours before test kits are installed.
      - b. Alkalinity: Perform ASTM F710 alkalinity testing during retrieval of moisture tests, directly inside dome area by placing several drops of manufacture provided solution to concrete surface. Wait 60-seconds and apply digital LCD pH meter. Record results to the nearest hundredth on final test report.
      - c. Temperature, Humidity and Surface Thermometer: Document temperature, humidity and surface temperature at installation and retrieval of moisture kits on final testing report. Note dew point temperature for control barrier installations.
    - 3. Tests shall determine the change in weight of moisture-absorbing anhydrous calcium chloride and the results shall represent the amount of moisture transmitting out of the concrete slab area. The value shall be expressed in pounds and shall be equivalent to the weight of the water that is emitted from a 1,000-sq. ft. concrete slab area in a 24-hour period of time.
  - B. Unless more restrictive emission levels are required by finish flooring manufacturer, if calcium chloride testing reveals water vapor emission levels greater than 3-pounds per 1,000-sq. ft. for cork tile flooring, resilient flooring, and epoxy-resin terrazzo flooring and 5-pounds per 1,000-sq. ft. for adhesively-applied carpet, apply sealer in accordance with manufacturer's instructions.

### 3.02 SURFACE PREPARATION

- A. Concrete shall cure for 48-hours and be structurally sound, clean, free of dust, grease, oil, existing coatings, paint marks, carbonated layers and other potential contaminants.
- B. Concrete shall be heavily profiled in accordance with the International Concrete Surface Repair Institute to a Concrete Surface Profile (CSP) #4.
- C. Profile edges, joints and cracks clean with a diamond crack chasing blade, removing fill.
- D. Acid etching, sanding discs or grinding surfaces are not acceptable.
- E. Vacuum entire surface with an industrial unit. Do not use clean sweep agents.

### 3.03 MIXING

A. Mix in accordance with manufacturer's instructions.

## 3.04 APPLICATION

- A. Pre-dampen concrete with clean water using an airless sprayer.
- B. Allow surface to dry for 20-minutes and broom areas that puddle.
- C. Pour product on concrete and scrub into surface with a nylon broom.
- D. While wearing spike shoes re-apply product after 40-minutes.
- E. Spread evenly over entire surface following rates recommended by manufacturer based on slab vapor emission levels. Apply multiple coats if required by slab vapor emission levels.

#### 3.05 CRACK AND JOINT TREATMENT

A. Cracks and joints less than 1/8-inch wide may be sealed during application. Re-seal cracks that remain exposed after application with additional product for greater crack bridging in accordance with manufacturer's instructions.

### 3.06 CEMENT PATCHING/LEVELING

- A. Allow material to cure for a minimum of 12- to 24-hours before using a cement product to smooth uneven floor transitions.
- B. Apply a non-porous primer to secure cement products.

# END OF SECTION