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Guide Specification

SECTION 09 96 35

CHEMICAL-RESISTANT COATINGS

(ChemXP-VE Flake)

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Two-component, inert-flake filled, vinyl ester resin based, coating/lining system, for steel and concrete.

1.2 RELATED REQUIREMENTS

- A. Section 03 30 00 – Cast-in-Place Concrete.

1.3 REFERENCE STANDARDS

- A. ASTM International (ASTM) (www.astm.org):
 1. ASTM C 531 – Standard Test Method for Linear Shrinkage and Coefficient of Thermal Expansion of Chemical-Resistant Mortars, Grouts, Monolithic Surfacing, and Polymer Concretes.
 2. ASTM D 638 – Standard Test Method for Tensile Properties of Plastics.
 3. ASTM D 790 – Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.
 4. ASTM D 1475 – Standard Test Method for Density of Liquid Coatings, Inks, and Related Products.
 5. ASTM D 2196 – Standard Test Methods for Rheological Properties of Non-Newtonian Materials by Rotational Viscometer.
 6. ASTM D 4060 – Standard Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser.
 7. ASTM D 4263 – Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method.
 8. ASTM D 4541 – Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers.

9. ASTM D 7234 – Standard Test Method for Pull-Off Adhesion Strength of Coatings on Concrete Using Portable Pull-Off Adhesion Testers.
10. ASTM E 96 / E 96M – Standard Test Methods for Water Vapor Transmission of Materials.

B. International Organization for Standardization (ISO) (www.iso.org):

1. ISO 8501 – Preparation of steel substrates before application of paints and related products — Visual assessment of surface cleanliness.

C. SSPC: The Society for Protective Coatings (SSPC) (www.sspc.org):

1. SSPC-SP 5/NACE No.1 – White Metal Blast Cleaning.
2. SSPC-SP 10/NACE No. 2 – Near-White Blast Cleaning.

D. US Environmental Protection Agency (EPA) (www.epa.gov):

1. EPA Method 24 – Determination of Volatile Matter Content, Water Content, Density, Volume Solids, and Weight Solids of Surface Coatings.

1.4 PREAPPLICATION MEETINGS

- A. Convene preapplication meeting 2 weeks before start of application of coating/lining system.
- B. Require attendance of parties directly affecting work of this Section, including Contractor, Architect, applicator, and manufacturer's representative.
- C. Review materials, moisture testing of concrete, protection of in-place conditions, surface preparation, application, protection, and coordination with other work.

1.5 SUBMITTALS

- A. In accordance with Division 01.
- B. Product Data: Submit manufacturer's product data, including surface preparation and application instructions.
- C. Samples: Submit manufacturer's sample of each color available.
- D. Manufacturer's Certification: Submit manufacturer's certification that materials comply with specified requirements and are suitable for intended application.
- E. Manufacturer's Project References: Submit manufacturer's list of successfully completed coating/lining system projects, including project name and location, name of architect, and type and quantity of coating/lining systems furnished.
- F. Applicator's Project References: Submit applicator's list of successfully completed coating/lining system projects, including project name and location, name of architect, and type and quantity of coating/lining systems applied.
- G. Warranty Documentation: Submit manufacturer's standard warranty.

1.6 QUALITY ASSURANCE

- A. Manufacturer's Qualifications: Manufacturer regularly engaged, for a minimum of 10 years, in the manufacturing of coating/lining systems of similar type to that specified.
- B. Applicator's Qualifications:
 - 1. Applicator regularly engaged, for a minimum of 5 years, in application of coating/lining systems of similar type to that specified.
 - 2. Employ persons trained for application of coating/lining systems.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Delivery Requirements: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name, manufacturer, and batch number.
- B. Storage and Handling Requirements:
 - 1. Store and handle materials in accordance with manufacturer's instructions.
 - 2. Keep materials in manufacturer's original, unopened containers and packaging until application.
 - 3. Store materials in clean, dry area indoors.
 - 4. Store materials out of direct sunlight.
 - 5. Keep materials from freezing.
 - 6. Protect materials during storage, handling, and application to prevent contamination or damage.

1.8 AMBIENT CONDITIONS

- A. Do not apply coating/lining system under ambient conditions outside manufacturer's limits.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: Tennant Coatings Inc., which is located at: 701 N. Lilac Dr.; Minneapolis, MN 55440; Toll Free Tel: 800-228-4943; Email:request info (Coatings@tennantco.com); Web:http://www.tennantcoatings.com
- B. Substitutions permitted in accordance with Division 01.
- C. Single Source: Provide materials from single manufacturer.

2.2 COATING/LINING SYSTEM

- A. Coating/Lining System: "ChemXP-VE Flake".
 - 1. Description: Two-component, inert-flake filled, vinyl ester resin based, coating/lining system, for steel and concrete.
- B. System Components:

1. Primer: "ChemXP-VE Primer".
2. Basecoat: "ChemXP-VE Flake".
 - a. Color: [Industrial Gray] [Off White].
3. Topcoat: "ChemXP-VE Flake".
 - a. Color: [Industrial Gray] [Off White].

C. Properties:

1. VOC Content, EPA Method 24: 1.27 lbs per gal (152 g/L).
2. Density, ASTM D 1475: 9.57 plus or minus 0.25 lbs per gal (1.15 kg/L).
3. Viscosity (Brookfield), ASTM D 2196: 3,250 plus or minus 250 cps.
4. Modulus of Elasticity (Bend Test), ASTM D 790: 435,000 psi (2,500 to 3,500 MPa).
5. Tensile Strength, ASTM D 638: 2,500 to 3,000 psi (17 to 20 MPa).
6. Abrasion Resistance, ASTM D 4060: 70 mg.
7. Adhesion Strength, Concrete, ASTM D 7234: Exceeds concrete strength.
8. Minimum Adhesion Strength, Steel, ASTM D 4541: 1,000 psi (7 N/mm²).
9. Linear Coefficient of Thermal Expansion, ASTM C 531: 15 to 17 x 10⁻⁶ in/in/degree F (27 to 30 x 10⁻⁶ cm/cm/degree C).
10. Water Vapor Permeability, ASTM E 96, Procedure E: 0.0014 perm-inch.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine surfaces to receive coating/lining system.
- B. Verify surfaces are structurally sound.
- C. Notify Architect of conditions that would adversely affect application or subsequent use.
- D. Do not begin surface preparation or application until unacceptable conditions are corrected.

3.2 PREPARATION

- A. Protection of In-Place Conditions: Protect surfaces not to receive coating/lining system from contact with coating/lining system materials.
- B. Surface Preparation – Carbon Steel:
 1. Prepare steel surfaces in accordance with manufacturer's instructions.
 2. Immersion or Frequent Spillage Conditions: Abrasive blast to white metal in accordance with SSPC-SP 5/NACE No.1 or ISO 8501, SA 3.
 3. Fumes or Occasional Spill Exposure and Dry Environments: Abrasive blast to near-white metal in accordance with SSPC-SP 10/NACE No. 2 or ISO 8501, SA 2.5.
 4. Minimum Surface Profile: 3 mils (75 microns).
- C. Surface Preparation – Concrete:
 1. Prepare concrete surfaces in accordance with manufacturer's instructions.
 2. Minimum Compressive Strength: 3,500 psi (25 N/mm²).
 3. Minimum Surface Strength:
 - a. For Coating Application: 200 psi (1.4 N/mm²).

- b. For Lining Application: 300 psi (2.1 N/mm²).
- 4. Ensure concrete is thoroughly cured and dry at time of application.
- 5. Residual Moisture Content: Maximum 4 percent.
- 6. Use plastic sheet test method in accordance with ASTM D 4263 to ensure concrete is moisture free.
 - a. If moisture is detected, repeat test until dry.
- 7. Abrasive Blast or Mechanically Abrade Surfaces to Remove:
 - a. Loose, delaminated, and damaged concrete.
 - b. Dirt, dust, debris, oil, grease, curing agents, bond breakers, paint, coatings, sealers, silicones, and other surface contaminants which could adversely affect application of coating/lining system.

3.3 APPLICATION

- A. Apply coating/lining system in accordance with manufacturer's instructions at locations indicated on the Drawings.
- B. Ensure surfaces are dry, clean, and prepared in accordance with manufacturer's instructions.
- C. Mixing:
 - 1. Mix material components together in accordance with manufacturer's instructions.
 - 2. Mix only enough material that can be applied within working time.
- D. Apply coating/lining system materials to obtain consistent mil thickness.
- E. Primer:
 - 1. Apply primer to prepared surfaces in accordance with manufacturer's instructions at 2 to 5 mils (50 to 125 microns) DFT.
 - 2. Steel Surfaces: Apply primer after abrasive blast cleaning and before formation of rust bloom.
 - 3. Allow primer to cure before application of basecoat.
- F. Basecoat: Apply basecoat in accordance with manufacturer's instructions at 15 to 20 mils (375 to 500 microns) DFT, with target of 18 mils (450 microns) DFT.
- G. Topcoat: Apply topcoat in accordance with manufacturer's instructions at 15 to 20 mils (375 to 500 microns) DFT, with target of 18 mils (450 microns) DFT.
- H. Total Applied Thickness, 2-Coat System: 30 to 40 mils (750 to 1,000 microns) DFT, with target of 36 mils (900 microns) DFT.

3.4 PROTECTION

- A. Allow coating/lining system to cure in accordance with manufacturer's instructions before placing in service.
- B. Protect completed coating/lining system from damage during construction.

END OF SECTION