

SECTION 09 97 23.17

CORROSION INHIBITOR COATING OF CONCRETE SURFACES

08/16

PART 1 GENERAL

1.1 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-03 Product Data

Vapor Phase Corrosion Inhibitor

Ionic Corrosion Inhibitor

Surface Sealant

Manufacturer's Storage and Handling Instructions

SD-07 Certificates

Manufacturer's Certificate

SD-08 Manufacturer's Instructions

Safety Data Sheets (SDS)

1.2 REGULATORY REQUIREMENTS

1.2.1 Environmental Protection

Submit an environmental protection plan for the corrosion inhibitor system application project that addresses all requirements of the SDS for the products utilized and assures compliance with all applicable regulations.

1.3 DELIVERY, STORAGE, AND HANDLING

Deliver corrosion inhibitor products in sealed and properly labeled containers. Store and handle products in accordance with the manufacturer's instructions. Submit manufacturer's storage and handling instructions as part of the product data submittal.

1.4 SAFETY METHODS

Comply with all applicable OSHA and local authority standards for personal protection, including the required record keeping and training. Submit compliance plan as part of the Health and safety plan submittal.

1.5 ENVIRONMENTAL CONDITIONS

1.5.1 Weather and Substrate Conditions

Consider present and forecasted weather conditions for each structure

prior to product application. Do not apply inhibitor system if rain is forecasted during the application or within 4 hours after the application is completed. The substrate temperature, air temperature, humidity and other environmental conditions must be within the limits recommended by the manufacturer for proper application. Document all relevant environmental conditions and include in the Daily Checklist submittals.

1.6 EQUIPMENT, TOOLS, AND MACHINES

Apply the inhibitor system utilizing methods, tools, and equipment approved by the manufacturer. Application equipment may include brushes, rollers, power rollers, spray equipment, squeegees, brooms, and pressure injection systems. Include the proposed application equipment and methods in the Corrosion Inhibitor Selection and Application Plan submittal.

1.7 SEQUENCING AND SCHEDULING

1.7.1 Structure Repair Areas Prior To Inhibitor System Application

Repair damaged and delaminated concrete areas and cracks in accordance with Section 03 01 00 REHABILITATION OF CONCRETE.

1.7.2 Surface Preparation of Concrete

Remove all existing coatings, laitance, contaminants, and any other substances that could interfere with the inhibitor penetration. Select removal methods appropriate for the structure and materials to be removed. Include proposed removal methods in the Corrosion Inhibitor Selection and Application Plan submittal.

1.7.3 Corrosion Inhibitor Selection and Application Plan

Prepare and submit a specific plan for structure corrosion inhibitor system application areas included in the project. At a minimum, include the product selections, structure areas to be treated, surface preparation requirements, application methods, application sequence and timing, and application rates. Submit the Corrosion Inhibitor Selection and Application Plan for review by the Designer of Record.

1.7.4 Corrosion Inhibitor Application

Apply the corrosion inhibitor system in accordance with the approved plan. Monitor and record the quantity of inhibitor applied to the surface, application method, surface temperature, and any other data or observations required by the plan. Inspect the surface for residue upon completion of the inhibitor application to ensure all of the inhibitor has penetrated the concrete surface. Apply a light spray of water if necessary to aid inhibitor penetration. After the corrosion inhibitor application and penetration is complete clean the concrete surface of any remaining residue in accordance with the manufacturer's recommendations.

PART 2 PRODUCTS

2.1 SYSTEM DESCRIPTION

The corrosion inhibitor system will consist of an organic vapor phase inhibitor, an ionic inhibitor or a combination of both inhibitors. Apply the organic vapor phase inhibitor first when a combination of inhibitors is utilized. In addition to the inhibitor system a reactive silicone

surface sealant or surface protection coating will be applied. Submit a list of proposed products for the corrosion inhibitor system application. Include product Safety Data Sheets (SDS), warranty information and the manufacturer's recommended special application procedures for extreme temperatures in the submittal.

2.2 MATERIALS

2.2.1 Penetrating Vapor Phase Corrosion Inhibitor

A solution of organic amine carboxylate compounds that migrate in the gas phase through the cement pores to form a corrosion inhibiting film on the reinforcing steel surface.

2.2.2 Penetrating Ionic Corrosion Inhibitor

A solution containing chemically reactive water-soluble inorganic silicates designed to act as an anodic inhibitor on the surface of the reinforcing steel.

2.2.3 Surface Sealant

A chemically reactive water dispersion of a silane/siloxane mixture that forms an insoluble cross-linked silicone membrane within the concrete matrix.

PART 3 EXECUTION

3.1 DAILY CHECKLISTS

Complete a checklist for each day of work on the structures included in the project. Record, at a minimum, the following information on the daily checklist: concrete surface temperature immediately prior to and after inhibitor application, or every 2 hours if there is a possibility of extreme temperature; concrete surface cleaning and preparation equipment and methods; concrete relative moisture immediately prior to inhibitor application; time of application and application equipment for each component; rate of application of each component; extent of surface treated; application method utilized; and any other requirements identified in the Corrosion Inhibitor Selection and Application Plan.

3.2 SURFACE PREPARATION

Examine all surfaces for cleanliness prior to application. Clean surfaces of visible contamination, coatings, sealants, debris, oils and fuels, and other similar materials. Treatment areas may be damp but no water ponding is permitted on flat horizontal surfaces. Measure and record concrete surface temperature immediately prior to inhibitor application. Do not apply inhibitor if concrete surface temperature is below 2 degrees C. Consult the manufacturer for special application procedures if the concrete surface temperature is in excess of 38 degrees C. Submit the special application procedures to the Designer of Record for review prior to application. Prepare the concrete surface for inhibitor application in accordance with the manufacturer's recommendations. Provide protection for equipment and structures in close proximity to the inhibitor application area to guard against overspray or product spillage. Use plastic sheeting to protect glass and decorative structure components and equipment from unintended inhibitor contact.

3.3 APPLICATION OF VAPOR PHASE CORROSION INHIBITOR

Apply the vapor phase inhibitor to the structure surface at the rate identified utilizing the methods, tools and equipment identified in the Corrosion Inhibitor Selection and Application Plan. Verify that the recommended amount of inhibitor has penetrated the structure surface. Multiple applications may be required to achieve the recommended application rate. Do not overspray or allow the inhibitor product to be lost due to run off. Replace any lost product with sufficient additional product to achieve the recommended application rate. Apply a light spray of water to the treated surface after each application to assist the inhibitor penetration into the concrete. Inspect the treated surface following application. Minimal to no residue should remain following the application. Clean the concrete surface of any residue in accordance with the manufacturer's recommendations.

3.4 APPLICATION OF IONIC CORROSION INHIBITOR

Apply the ionic inhibitor to the structure surface at the rate identified utilizing the methods, tools and equipment identified in the Corrosion Inhibitor Selection and Application Plan. Verify that the recommended amount of inhibitor has penetrated the structure surface. Multiple applications may be required to achieve the recommended application rate. Do not overspray or allow the inhibitor product to be lost due to run off. Replace any lost product with sufficient additional product to achieve the recommended application rate. Inspect the treated surface following application. Minimal to no residue should remain following the application. Clean the concrete surface of any residue in accordance with the manufacturer's recommendations.

3.5 APPLICATION OF COMBINED VAPOR PHASE AND IONIC CORROSION INHIBITOR SYSTEM

Apply the vapor phase organic inhibitor first when a combination of vapor phase and ionic inhibitors are used together on the same structure. Follow the manufacturer's recommendations regarding the time period between application of the vapor phase inhibitor and the ionic phase inhibitor. Utilize the application specifications identified above for each type of inhibitor.

3.6 APPLICATION OF SURFACE PROTECTION COATING

3.6.1 Surface Sealant

Prepare the concrete surface in accordance with the manufacturer's recommendations. Apply surface sealants to the structure surface at the rate identified utilizing the methods, tools and equipment identified in the Corrosion Inhibitor Selection and Application Plan. Verify that the recommended amount of sealant has penetrated the structure surface. Multiple applications may be required to achieve the recommended application rate.

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