

Section 03050: CRYSTALLINE WATERPROOFING ADMIXTURE

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Crystalline and corrosion protection admixture for concrete mix.
- B. Related Sections: Sections related to the section include:
 - 1. Concrete: Division 03 Concrete Sections.

1.2 REFERENCES

- A. General: Standards listed by reference, including revisions by issuing authority, form a part of this specification section to extent indicated. Standards listed are identified by issuing authority, authority abbreviation, designation number, title, or other designation established by issuing authority. Standards subsequently referenced herein are referred to by issuing authority abbreviation and standard designation.
- B. ASTM International:
 - 1. ASTM C39 Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
 - 2. ASTM C666 Standard Test Method for Resistance of Concrete to Rapid Freezing and Thawing.
- C. American Concrete Institute (ACI):
 - 1. ACI 308 Standard for Curing Concrete.
- D. US Army Corps of Engineers (USACE):
 - 1. CRD C-48 Permeability of Concrete.

1.3 SYSTEM DESCRIPTION

- A. Performance Requirements: Provide concrete concentrate admixture which has been manufactured and added to concrete mix at time of concrete batching to maintain performance criteria stated by manufacturer without defects, damage or failure.
 - 1. Coordinate and schedule addition of concrete admixture with concrete batching.

1.4 SUBMITTALS

- A. General: Submit listed submittals in accordance with Conditions of the Contract and Division 01 Submittal Procedures Section.
- B. Product Data: Submit manufacturer's product data for specified products.
- C. Quality Assurance Submittals: Submit the following:
 - 1. Test Reports: Certified test reports showing compliance with specified performance characteristics and physical properties.
 - 2. Certificates: Product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
 - 3. Manufacturer's Instructions: Manufacturer's application instructions.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Manufacturer capable of providing field service representation during construction and approving application method.

CRYSTALLINE WATERPROOFING ADMIXTURE

- B. Regulatory Requirements:
 - 1. Approvals:
- C. Preinstallation Meetings: Conduct preinstallation meeting to verify project requirements, substrate conditions, manufacturer's installation instructions and manufacturer's warranty requirements. Comply with Division 01 Project Management and Coordination (Project Meetings) Section.

1.6 DELIVERY, STORAGE & HANDLING

- A. General: Comply with Division 01 Product Requirements Sections.
- B. Ordering: Comply with manufacturer's ordering instructions and lead time requirements to avoid construction delays.
- C. Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
- D. Storage and Protection: Store materials protected from exposure to harmful weather conditions and at temperature and humidity conditions recommended by manufacturer. Store PENETRON® products dry at a minimum temperature of 40 degrees F (4 degrees C).

1.7 WARRANTY

- A. Project Warranty: Refer to Conditions of the Contract for project warranty provisions.

PART 2 - PRODUCTS

2.1 CONCRETE CONCENTRATE ADMIXTURE

- A. Manufacturer: ICS PENETRON® International Ltd.
 - 1. Contact: 45 Research Way, Suite 203, East Setauket, New York 11733. Telephone: (631) 941-9700, Fax: (631) 941-9777; E-mail: info@penetron.com; website: www.penetron.com
- B. Product(s): PENETRON ADMIX™
 - 1. PENETRON ADMIX™: Integral waterproofing admixture included in the concrete mix at the time of batching.
 - 2. Product(s) Testing: Provide concrete concentrate to comply with ACI 308, ASTM C39, ASTM C666, USACE CRD C-48-73, NCHRP 244 and AASHTO-T 277, and the following attributes:
 - Permeability:** USACE CRD C-48 – Can withstand 232 PSI (514 feet of head water pressure or 157m) or 1.54 MPa (16 Bar) with no measurable leakage.
 - Chemical Resistance:** Resistant to alkaline and acid conditions of pH range 3 – 11 in constant contact.
 - Freeze/Thaw Durability:** ASTM C666 – Relative durability of 97.4%.
 - Compressive Strength:** ASTM C39 Compressive Strength of Cylindrical Concrete Specimens. Compressive strength increases of greater than 6% at 28 days.
 - Chloride Resistance:** As per AASHTO-T 277, a very low 750 coulombs of charges passed across the PENETRON ADMIX™ treated sample as compared to 4130 coulombs of charge for the untreated sample. As per NCHRP 244, a reduction of greater than 89% in the first 1 inch of concrete and greater than 95% in the 1 – 2" concrete depth.

CRYSTALLINE WATERPROOFING ADMIXTURE

2.2 PRODUCT SUBSTITUTIONS

- A. Substitutions: No substitutions permitted.

2.3 RELATED MATERIALS

- A. Related Materials: Refer to other sections listed in Related Sections paragraph herein for related materials.

2.4 MIXES

- A. Mixing: Mix proprietary materials in accordance with manufacturer's instructions, including product data and product technical bulletins.
 - 1. Batch Mix: Add proprietary admixtures to concrete mix at time of concrete batch mixing. The sequence of procedures for addition will vary according to the type of batch plant operation and equipment.

2.5 SOURCE QUALITY

- A. Source Quality: Obtain concrete concentrate admixture products from a single manufacturer.

PART 3 - EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

- A. Compliance: Comply with manufacturer's product data, including product technical bulletins, product catalog installation instructions and product carton instructions for installation.

3.2 APPLICATION PROCEDURES

- A. Add PENETRON ADMIX™ to concrete mix at time of batching. The sequence of procedures for addition will vary according to the type of batch plant operation and equipment. Contact admix manufacturer to review your particular requirements:
 - 1. Ready-Mix Plant, Dry Batch Operation: Add PENETRON ADMIX™ in powder form to the drum of the ready-mix truck. Drive the truck under the batch plant and add 60 - 70% of the required water along with 300 - 500 lb (136 - 227 kg) of aggregate. Mix the materials for 2 - 3 minutes to ensure the PENETRON ADMIX™ is distributed evenly throughout the mix water. Add the balance of materials to the ready-mix truck in accordance with standard batch practices.
 - 2. Ready-Mix Plant, Central Mix Operation: Mix PENETRON ADMIX™ with water to form a very thin slurry (i.e., 40 lb (18 kg) of powder mixed with 6 gal (22.7 L) of water). Pour the required amount of material into the drum of the ready-mix truck. The aggregate, cement and water should be batched and mixed in the plant in accordance with standard practices (taking into account the quantity of water that has already been placed in the ready-mix truck). Pour the concrete into the truck and mix for at least 5 minutes to ensure even distribution of the PENETRON ADMIX™ throughout the concrete.
 - 3. Precast Batch Plant, Pan-Type Mixer: Add PENETRON ADMIX™ to the rock and sand, then mix thoroughly for 2 - 3 minutes before adding the cement and water. The total concrete mass should be blended using standard practices. Obtain a homogeneous mixture of PENETRON ADMIX™ with the concrete; do not add dry Admix powder directly to wet concrete as this may cause clumping and thorough dispersion will not occur.

CRYSTALLINE WATERPROOFING ADMIXTURE

4. **Setting Time and Strength:** The setting time of concrete is affected by the chemical and physical composition of ingredients, temperature of the concrete and climatic conditions. Retardation of set may occur when using PENETRON ADMIX™. The amount of retardation will depend upon the concrete mix design and the dosage rate of the Admix. However, under normal conditions, PENETRON ADMIX™ will provide a normal set concrete. Concrete containing PENETRON ADMIX™ may develop higher ultimate strengths than plain concrete. Trial mixes should be carried out under project conditions to determine setting time and strength of the concrete.
- B. **Related Products Installation:** Refer to other sections listed in Related Sections paragraph herein for related products installation.
 1. **Concrete Installation:** Refer to Division 03 Sections for concrete installation.

3.3 PROTECTION

- A. **Protection:** Protect installed product and finish surfaces from damage during construction.

END OF SECTION