

# GUIDE SPECIFICATION FOR CEM-KOTE® CW PLUS: CRYSTALLINE WATERPROOFING

## 07 16 00 – Cementitious and Reactive Waterproofing

Specifier Notes: This guide specification is written according to the Construction Specifications Institute (CSI) format. The section must be carefully reviewed and edited by the Architect or Engineer to meet the requirements of the project. Coordinate this section with other specification sections and drawings.

Specifier Notes: CEM-KOTE CW PLUS is a crystalline (capillary) in-depth waterproofing for new or existing water storage facilities and treatment of concrete structures, digesters, clarifiers and utility vaults. CEM-KOTE CW PLUS is suitable for waterproofing of retaining walls, basements, concrete slabs, swimming pools and other concrete structures.

CEM-KOTE CW PLUS is one component (add water only), Portland cement based coating (slurry), containing silica based materials. Under water pressure (negative or positive), the soluble silicate penetrates (due to osmotic pressure) into the substrate, where it reacts with lime and forms insoluble calcium silicate crystals which “plug” the capillary pores and waterproof the concrete while allowing the water vapor to pass.

CEM-KOTE FLEX ST is approved for use in potable water facilities as per ANSI/NSF Standard 61 – Barrier Materials.

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Surface preparation.
- B. Application of a crystalline waterproofing coating.
- C. The general conditions, supplementary conditions and general requirements of this document apply to general contractors, sub-contractors, material suppliers and all other persons furnishing labor and materials under this section.

#### 1.02 WORK INCLUDED

- A. Provide all labor, material, and equipment necessary to apply crystalline coating in application over concrete surfaces as shown on the contract drawings and specified herein.

#### 1.03 RELATED SECTIONS

Specifier Notes: Edit the list of related sections as required for the project. List other sections dealing with work directly related to this section.

- A. Section 03 30 00 – Cast-In-Place Concrete.
- B. Section 03 01 30.61 – Rehabilitation of Cast-in-place Concrete.
- C. Section 07 10 00 – Dampproofing and Waterproofing.

#### 1.04 REFERENCES

- A. ASTM C 109/C 109M - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (use 2 in (50 mm) Cube Specimens).
- B. ASTM C 321 - Standard Test Method for Bond Strength of Chemical-Resistant Mortars.

- C. ASTM C 348 - Standard Test Method for Flexural Strength of Hydraulic Cement Mortars.
- D. ASTM C 596 - Standard Test Method for Drying Shrinkage of Mortar Containing Portland Cement.
- E. ASTM C 944 - Standard Test Method for Abrasion Resistance of Concrete or Mortar Surfaces by the Rotating-Cutter Method.
- F. COE CRD-C 48 - Method of Test for Water Permeability of Concrete; US Army Corps of Engineers.

#### 1.05 QUALITY ASSURANCE

- A. Contractor will provide the proper equipment, manpower, and supervision at the jobsite to install the crystalline waterproofing coating in compliance with the project plans and specifications.
- B. Prepare a site sample approximately 4' x 4' (1200 mm x 1200 mm). This sample will be regarded as the minimum standard of workmanship acceptable for this project.
- C. Installation must be carried out by an experienced contractor with an adequate number of skilled personnel, experienced in the application of the crystalline coating systems.
- D. Maintain a record of the batch numbers of all materials supplied for this project.

#### 1.06 PRE-CONSTRUCTION MEETING

- A. Convene [one] [\_\_\_\_], week [\_\_\_\_] prior to commencing work of this section, in accordance with Section 1.05 - Quality Assurance, meeting with manufacturer's technical representative, General Contractor and Site Engineer to review the installation procedures.

#### 1.07 SUBMITTALS

- A. Comply with Section 01 33 00 - Submittal Procedures.
- B. Submit manufacturer's product data and application instructions.

#### 1.08 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.
- B. Store crystalline waterproofing materials in a clean, dry area protected from direct sunlight, weather and other damage.
- C. Protect materials during handling and application to prevent damage or contamination.

#### 1.09 ENVIRONMENTAL REQUIREMENTS

- A. Do not apply if ambient temperatures cannot be kept above 40°F (5°C) during, and for at least 48 hours before and after application, or when rain is imminent.
- B. Do not apply crystalline waterproofing to frozen or frost filled surfaces.
- C. Protect surrounding surfaces from damage due to work of this trade.

### PART 2 PRODUCTS

## 2.01 MANUFACTURER

- A. W. R. MEADOWS, INC., PO Box 338, Hampshire, Illinois 60140-0338. (800) 342-5976. (847) 683-4500. Fax (847) 683-4544. Web Site [www.wrmeadows.com](http://www.wrmeadows.com).
- B. GEMITE PRODUCTS INC., 1787 Drew Road, Mississauga, Ontario, Canada L5S 1J5. (888) 443-6483. Fax (905) 672-6780. Web Site: [www.gemite.com](http://www.gemite.com).

## 2.02 MATERIALS

- A. Crystalline Waterproofing Coating: CEM-KOTE CW PLUS manufactured by Gemite Products Inc., and distributed by W. R. Meadows.

## 2.03 ACCESSORIES

- A. Hydraulic Cement for stopping active water leaks: MEADOW-PLUG manufactured by W.R. Meadows.
- B. Thin Patching Mortar for thin repairs, including bug holes: MEADOW-PATCH™ T1 manufactured by W.R. Meadows.
- C. General Purpose Structural Repair Mortar for repairs or coves: MEADOW-CRETE® GPS manufactured by W.R. Meadows.
- D. Flexible Cementitious Coating for existing crack repairs: CEM-KOTE FLEX ST manufactured by Gemite Products Inc., and distributed by W. R. Meadows.
- E. Reinforcing Fabric (Non-Woven) for crack treatment: REINFORCING FABRIC NW manufactured by Gemite Products Inc., and distributed by W.R. Meadows.

## PART 3 EXECUTION

### 3.01 EXAMINATION

- A. Examine surfaces to receive the crystalline waterproofing.
- B. Report to owner's representative, in writing, any defects in previously prepared Work, or unsatisfactory site conditions.

Specifier Notes: The concrete surfaces in new construction may have "bug holes", poor compaction areas, "honeycombing", form displacements, and other imperfections. These may have to be repaired/leveled prior to application of the CEM-KOTE CW PLUS. The project specification must identify the responsibility for leveling these imperfections.

- C. Do not begin surface preparation or application until unacceptable conditions have been corrected.
- D. Starting work under this section means acceptance of the surface and previously prepared work.

### 3.02 SURFACE PREPARATION

- A. Thoroughly clean the surface using high-pressure wash with a minimum 34.5 MPa (5,000 psi), or 24.1 MPa (3,500 psi) with sand brought into the nozzle. Alternatively, sandblast the surface.

- B. Ensure all soft concrete surfaces and any bond-inhibiting materials, such as release agents, are removed.

Specifier Notes: CEM-KOTE CW PLUS contains reactive materials that react with lime generated by the hydration reaction of cement and “plug” the capillary porosity, making concrete watertight under water head pressure. CEM-KOTE CW PLUS will not waterproof construction joints, expansion joints, larger dynamic cracks construction joints, poorly consolidated concrete, or penetrations through concrete.

- C. Surface Repair
1. Use thin patching mortar to patch the "honeycombing" and air pockets.
  2. Use polymer modified structural repair mortar for patching in excess of 1/4" (6 mm).
  3. Uneven concrete, due to concrete form misplacement, must be chipped away and surface patched smooth.
  4. Use hydraulic cement mortar to stop any active water leaks.
- D. Treatment of Existing Cracks and All Non-Structural Joints
1. Identify all the existing cracks and joints and apply a thin layer of the flexible cementitious coating approximately 4 1/2" (11.5 cm) wide and 19 mils (0.5 mm) thick by trowel or brush.
  2. Embed the non-woven reinforcing fabric over the entire area of this coating and work in using trowel.
  3. Ensure this coating application totally covers the reinforcing fabric.
  4. Let dry sufficiently and apply an additional coat of this flexible cementitious coating to build up to a total thickness of 38 mils (1.0 mm) over the entire area.
- E. Treatment of Protruding Elements
1. Apply two coats of flexible cementitious coating at a thickness of 63 mils (1.6 mm) to both the concrete surface and protruding element.
  2. Form a 2" x 2" (50 mm x 50 mm) minimum cove, using polymer modified structural repair mortar in the corner.
  3. Allow to polymer modified structural repair mortar to cure.
- F. Treatment of Construction Joints and Tie Holes
1. Prime seal strips/ reglets in pre-formed 1" x 1" (25 mm x 25 mm) cavities with crystalline waterproofing material in slurry consistency.
  2. Fill the area flush with overhead/vertical patching mortar.
- G. Treatment of Inside Corners
1. Install a 2" x 2" cove over the inside corners using polymer-modified structural repair mortar.
  2. Apply a thin layer of flexible cementitious coating approximately 10" wide and 31 mils by trowel or brush.
  3. Embed the woven reinforcing fabric over the entire area of this coating and work in using trowel.
  4. Ensure this coating application totally covers the reinforcing fabric.
  5. Apply an additional coat of this flexible cementitious coating to build up a total thickness of 63 mils over the entire area.

### 3.03 MIXING

- A. Mix the content of the bag, component A, with approximately 1.06 – 1.32 USG (4-5 L) of water.
- B. Use a heavy-duty drill (400 - 600 RPM) with a helix screw or paddle mixer to achieve thorough mixing.
- C. Gradually add the dry material into the water and mix until a smooth and lump free mix is obtained.
- D. Adjust the water for brushable consistency or a stiffer consistency for trowel application.

- E. Ensure that crystalline waterproofing coating is applied within 15 to 20 minutes after mixing.

### 3.04 APPLICATION

- A. Vertical Surfaces
  1. Apply base coat of crystalline waterproofing material in slurry consistency at uniform rate of 1.25 - 1.4 lb/ yd<sup>2</sup> (0.7 - 0.75 kg/m<sup>2</sup>).
  2. Apply using appropriate compressed-air spray equipment, stiff masonry brush or stiff broom.
  3. Apply finish slurry coat of waterproofing mixture at 1.25 - 1.4 lb/ yd<sup>2</sup> (0.7 - 0.75 kg/m<sup>2</sup>) after base coat has reached initial set but is still "green" (tacky).
  4. Apply so that final brush or broom strokes leave parallel, uniform texture.
- B. Freshly Poured Slabs
  1. Dry-sprinkle waterproofing material to freshly poured slabs at a rate of 2.0 lb/ yd<sup>2</sup> (1 kg/ m<sup>2</sup>) and power trowel.
- C. Over Mud Slab/Under Finish Slab
  1. Dry distribute to pre-watered mud slab at a rate of 2.25 lb/ yd<sup>2</sup> (1.2 kg/ m<sup>2</sup>) immediately prior to casting the structural slab.
- D. Existing Slabs
  1. Apply by brush or spray equipment waterproofing material in slurry consistency, in one coat on existing slab.
    - i. For standard applications, apply at rate of 2.0 lb/ yd<sup>2</sup> (1 kg/ m<sup>2</sup>).
    - ii. For applications in contact with salt or wastewater, apply at rate of 2.5 - 2.8 lb/ yd<sup>2</sup> (1.4 - 1.5 kg/ m<sup>2</sup>).
  2. Spread material evenly and work it well into the surface.

### 3.05 CURING

- A. Moist cure crystalline waterproofing for 4 days.
- B. Protect surfaces from rapid drying, rain, and frost.

### 3.06 PREPARATION FOR DECORATION, COATING, AND TILING

- A. Cure surfaces, treated with crystalline waterproofing, for 4 weeks, if these are to be coated, painted or tiled.
- B. At the end of the curing period, saturate surfaces with water and neutralize with a 1:8 solution of muriatic acid.
- C. Rinse waterproofed areas thoroughly with water.

### 3.07 ADJUSTING

- A. Following application and completion of related work, as required, but well prior to completion of entire project, fill tanks to capacity and allow to stand not less than 2 weeks
- B. If any leaks appear during this period, drain tanks. Notify Owner prior to draining tanks.
- C. Stop leakage due to curing and shrinkage cracks by installing plugs, seal-strips and additional surface treatment at no additional cost to the Owner
- D. Following repairs re-test by refilling tank and allow standing not less than 1 week.
- E. Follow this procedure until all leakage is eliminated.

- F. Thoroughly rinse all tanks and reservoirs with water and with 100 ppm chlorine water solution.

3.08 SITE CLEANUP

- A. Remove all excess and waste materials from the jobsite in accordance with contract provisions.
- B. Ensure all surrounding areas where the material has been applied are free of debris.

END OF SECTION