CEM-KOTE™ FLEX CR
Flexible, Hydrogen-Sulfide-Resistant, Cementitious Waterproofing

DESCRIPTION
CEM-KOTE FLEX CR is a highly flexible, fiber-reinforced, hydraulic cement based material. It is a two-component system consisting of dry Component A and liquid Component B. For additional tensile strength, it may be reinforced with REINFORCING FABRIC HD™.

USES
The primary use of CEM-KOTE FLEX CR is in waterproofing and protection of concrete structures exposed to sulfuric acid (generated by microbiological oxidation of hydrogen sulfide). This includes concrete structures in wastewater treatment facilities (digesters, sludge tanks and clarifiers), manholes, and sewer systems. It is also used in waterproofing and restoration of concrete structures in thin sections, where superior flexibility, chemical resistance, and breathability are required. It protects and waterproofs structures subjected to various chemicals, such as concrete floors, tanks and secondary containment structures. It also provides excellent protection for concrete against carbonation.

For wastewater treatment facilities, three systems are available:

System #1 CEM-KOTE FLEX ST
Used in all open concrete structures (hydrogen sulfide is escaping directly to air), such as channels, clarifiers, and other open concrete structures.

Two coats of CEM-KOTE FLEX ST
Total minimum thickness: .08” (2 mm)

System #2: CEM-KOTE FLEX CR
Used in closed structures (hydrogen sulfide cant escape to air) and when the hydrogen sulfide concentration is between 20 - 50 PPM. Application include closed sludge tanks, digesters, pumping/lift stations and other "closed" concrete structures.

Two coats
First coat: CEM-KOTE BARRIER COTE 100 [min. .04” (1 mm) thick]
Second coat: CEM-KOTE FLEX CR [min. .04” (1 mm) thick.

System #3
Used in closed structures; when hydrogen sulphide concentration is higher than 50 PPM. It is also used in protection of concrete in chemical storage tanks, secondary containment structures and floors. Note: Some new treatment technologies may result in much higher H2S concentrations than 50 PPM.

Three coats
First coat: CEM-KOTE BARRIER COTE 100 [min. .04” (1 mm) thick
Two coats of GEM-COTE EP 100 (100% solids epoxy) minimum total thickness [.02” (0.5 mm)]

FEATURES/BENEFITS
- Excellent resistance to sulfuric acid (MIC generated).
- Good chemical resistance.
- Long term crack resistance.
- Superior freeze/thaw resistance.
- Excellent bond to clean substrate.
- Self-curing.
- Breathable.
- Very low shrinkage.
- Vermin proof.
- Easy application.

PACKAGING
CEM-KOTE FLEX CR dry Component A is packaged in 35.3 lb. (16 kg) bags and liquid Component B is packaged in 1.3 gal. (4.9 L) plastic jugs.
COVERAGE
CEM-KOTE FLEX CR yields 0.37 ft³ (10.4 L) and covers approx. 112 ft² at 40 mils (10.4 m² at 1 mm) thickness per kit, when applied in one coat. In applications (e.g., elevated floors) where CEM-KOTE BARRIER COTE 100 is not used, apply two coats of CEM-KOTE FLEX CR. The coverage is 73.6 ft² at 60 mils (6.5 m² at 1.6 mm) thickness per kit applied in two coats. The actual coverage will depend on surface roughness and the thickness applied. The applicator must carry out a test application to determine the actual coverage for the given substrate and application thickness.

SHELF LIFE
When stored in a dry area, the material has a shelf life of one year. The liquid Component B must not freeze.

TECHNICAL DATA

<table>
<thead>
<tr>
<th>Property</th>
<th>Non-Reinforced</th>
<th>Reinforced</th>
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<tbody>
<tr>
<td>Ultimate Tensile Stain</td>
<td>20 - 25%</td>
<td>25 - 30%</td>
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<tr>
<td>(ASTM D412 Mod.) at 68° F</td>
<td>(20° C)</td>
<td></td>
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<tr>
<td>Ultimate Tensile Stress</td>
<td>145 - 188 psi</td>
<td>(290 - 362 psi)</td>
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<tr>
<td>(ASTM D412 Mod.) at 68° F</td>
<td>(1.0 - 1.3 MPa)</td>
<td>(2.0 - 2.5 MPa)</td>
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<tr>
<td>(20° C)</td>
<td></td>
<td></td>
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<tr>
<td>Crack Spanning (Gemite ISO TP 005) at 68° F (20° C)</td>
<td>0.5 mm (20 mls)</td>
<td>1.6 mm (63 mls)</td>
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<tr>
<td>Water Vapor Permeance</td>
<td>350 ng/Pa.s.m²</td>
<td>(6.42 perms)</td>
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<td>(ASTM E96), wet cup, 1.6 mm Thick</td>
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<tr>
<td>Salt Scaling Resistance ASTM 672</td>
<td>Excellent</td>
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<tr>
<td>Chemical Resistance</td>
<td>No deterioration or delamination</td>
<td>8% weight increase after 140 days exposure</td>
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<tr>
<td>Sulfuric acid, pH 1 - sewer test chamber, 1 year exposure</td>
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<tr>
<td>Sulfuric acid 5% - Gemite ISO TP 24</td>
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<tr>
<td>Hydraulic Impermeability</td>
<td>Water head &gt;130’</td>
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<tr>
<td>TTP 1411 (negative side), 2mm thickness</td>
<td>(&gt;39.8 m)</td>
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A high porosity concrete block coated with a CEM-KOTE FLEX CR "burst" at 130’ (39.8 m) water head pressure with CEM-KOTE FLEX CR shows no signs of wetness.

CEM-KOTE FLEX CR exhibits a high resistance to majority of mineral acids in moderate concentrations for shorter periods of time. It is highly resistant to concentrated salt solutions and caustic environments.

APPLICATION

Surface Preparation ... Remove all deteriorated and loose concrete, form release agents, oil, grease, laitance, dust, dirt and efflorescence by dry or wet sandblast or shotblast to achieve surface CSP #3 as per the ICRI (International Concrete Repair Institute). Repair deeper areas using GEM-PLAST TC or FIBRE-PATCH OV. The proper surface preparation is essential for a successful waterproofing using CEM-KOTE FLEX CR/CEM-KOTE BARRIER COTE 100.

Reinforcing Steel ... Remove all loose rust from any exposed reinforcing steel and apply two coats of FIBRE-PRIME rustproofing.

Crack Treatment ... All cracks must be treated before application of CEM-KOTE FLEX CR or CEM-KOTE BARRIER COTE 100. Contact W. R. MEADOWS for advice specific to the application.

Mixing ... Mixing of CEM-KOTE FLEX CR and CEM-KOTE BARRIER COTE 100 is identical. Thoroughly mix liquid component B prior to its use. Use a clean paddle, helix mortar mixer, or heavy duty drill (400 - 600 rpm) with a mixing paddle. Pour approximately 80% of the component B into the mixer, gradually adding the dry material into the liquid and mix until a smooth and lump-free mix is obtained. Add the remaining liquid (as required) for given application consistency. A small amount of water can be added at higher ambient temperatures, if required.
Application Method ... Apply CEM-KOTE BARRIER COTE 100 a minimum of 0.04” (1 mm) thick to a saturated surface damp surface. Trowel or brush apply first coat of CEM-KOTE BARRIER COTE 100 and second coat of CEM-KOTE FLEX CR to a minimum 0.06” - 0.12” (1.6 - 3 mm) (60 - 120 mils) total thickness. Both materials can be spray applied using a hopper gun or positive displacement (moyno or carrousel) pump with a suitable plastering spray nozzle. The second coat must be applied into a green first coat, usually within 10-15 minutes, depending on temperature and relative humidity. The delayed application of the second coat could result in its debonding. Time the application of second coat to assure that the first is not disturbed.

Reinforcing Fabric ... When using REINFORCING FABRIC HD throughout the entire area, first apply a thin layer of CEM-KOTE BARRIER COTE 100 by brushing or spraying. When spraying, brush each coat to eliminate all pinholes. Embed REINFORCING FABRIC HD into the first coat and follow with a second coat of CEM-KOTE FLEX CR. REINFORCING FABRIC HD must be fully covered. The total minimum applied thickness of CEM-KOTE BARRIER COTE 100 and CEM-KOT FLEX CR, including REINFORCING FABRIC HD, must be 0.08” (2 mm) (80 mils).

Curing ... Cure CEM-KOTE FLEX CR by air drying for a minimum of three days prior to continuous exposure to water. Protect fresh applications from rain, strong wind, and intense sunlight for 12 hours. When working under tarps at freezing temperatures, use electrical heaters to prevent carbonation of the material.

Cleanup ... All tools must be cleaned with water immediately after use. Cured material can only be removed mechanically.

PRECAUTIONS
Some maintenance may be required depending upon the type of chemical environment and the length of exposure. Do not apply CEM-KOTE FLEX CR when the temperature is expected to be below 40° F (4° C) within 48 hours or when rain is imminent. Follow hot weather concreting procedures when applying CEM-KOTE FLEX CR at temperatures above 77° F (25° C). Not designed for heavy traffic areas. Skin might be sensitive to hydraulic cement or the liquid additive. Recommended use of rubber gloves. Avoid contact with eyes and prolonged contact with skin. If contact occurs, flush immediately with water. Seek medical advice if irritation occurs. Harmful if digested. Keep product out of reach of children. For industrial use only. Consult SDS for additional information.

LEED INFORMATION
May help contribute to LEED credits:
- EAp2: Minimum Energy Performance
- EAc2: Optimize Energy Performance
- MRc9: Construction and Demolition Waste Management

CEM-KOTE FLEX CR is manufactured by:
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Web: www.gemite.com

For most recent data sheet, further LEED information, and SDS, visit www.wrmeadows.com.
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