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CCS™ Binder, InsulPOX™

Low Modulus Toughened Insulating Polymer Concrete (IPC)

CCS Binder, InsulPOX is a three-component, trowelable, low modulus, toughened polymer overlay formulated specifically for exterior applications where thermal insulation is required including trench floors and walls and sumps in LNG terminals. The cured product has excellent resistance to abrasion as well as thermal and mechanical shocks and can withstand foot traffic. Its long cure cycle, tolerance of surface dampness, resistance to most solvents make it ideally suited for a variety of installations or repairs. InsulPOX can be pre-cast into 0.75-1" thick panels for faster installation on vertical surfaces and has excellent compressive strength for an insulating polymer. The neat resin material **Meets ASTM C881, Type III, Grade 1.**

Features

Non-flammable polymer
Long working time allows easy placement
Does not embrittle; stays tough and flexible
Withstands thermal and mechanical shock
Environmentally safe - No VOC solvents

Features CCS Binder, InsulPOX is a three-component polymer concrete overlay. Its low thermal conductivity provides excellent insulating properties in cryogenic applications such as secondary containment for LNG leaks or spills. InsulPOX contains UV stabilizers and flame-retardant additives that render it nonflammable.

Limitations Minimum installation temperature is 40 °F. Maximum thickness of approx. 2" per lift. Do not add solvents or otherwise thin this material. Applying this material on a grade greater than 1% can lead to self-leveling. Not suitable for heavy equipment traffic.

Packaging & Color: Standard package sizes of Part A + Part B are 7.93 gallons combined. Part C is packaged in a 50 lb. sack per unit. Standard mix color is concrete tan/grey.

Chemical Resistance: It has limited resistance to hydrocarbon solvents and acids and very good resistance to alkalis. Performance is a function of the specific chemical and concentration, ambient and solution temperatures, exposure times and housekeeping procedures. For information on specific chemicals and exposure conditions, contact ChemCo Systems.

Surface Preparation: Concrete surfaces may be dry or damp and must be sound and free of all bond-inhibiting substances. Prepare surfaces in accordance with *ASTM D 4259* or *ACI 503R* and ChemCo Systems' specific recommendations. Cleaned concrete surfaces should have a minimum strength of 250 psi in direct tension. Steel surfaces should be cleaned to white metal according to SSPC SP 5. For substrates with potential moisture vapor transmission, consider pretreating with CCS MVR Primer.

Mixing: CCS InsulPOX is a three-component system. The resin to hardener (Part A : Part B) mix ratio is 2:1, by volume. Read safety data sheet (SDS) information before handling the product. Wear proper PPE which includes but is not limited to safety glasses, rubber gloves and N95 facemask when handling the materials. Premix the individual components before drawing from bulk packaging. Transfer appropriate quantities of Part A & Part B into a mixing container. Blend thoroughly using a Jiffy mixer blade attached to a low speed (350 - 750 rpm) electric or pneumatic drill and add Part C ceramic microspheres while mixing at a low speed with a mortar mixer or by hand. Continue blending at a low speed for 1-2 minutes after all of the Part C is added. Mix only epoxy quantities that can be installed before the pot life of the mixed material expires.

Installing: Apply the epoxy insulating polymer concrete overlay to the clean, sound substrate. The polymer concrete may be rodded, tamped, screeded or troweled into place. Clean application tools frequently. Additional troweling 2 hours (depending on temperature) after initial mixing (post installation) is recommended to allow air entrained during mixing to escape. Blowing forced hot air (150-200 ^{o}F) over the curing polymer will facilitate the escaping of entrained air. Allow to cure for at least 8 hours post installation (depending on ambient temperature) prior to allowing foot traffic on the surface. A trial application is strongly recommended prior to final installation on a project in order to evaluate the nature of the material as it interacts with the substrate. If heavy foot traffic is anticipated, sand may be broadcasted to provide slip resistance. Consult ChemCo Systems for sand application guidelines.

Notes: In exterior applications over concrete, the optimum time period to install the overlay is late afternoon or evening during a period of declining substrate temperatures. In very hot climates, it is best to apply at night. If there is moisture vapor drive through the underlying substrate, this may cause pinholes in the epoxy insulating polymer concrete. Precast panels of InsulPOX can be installed using CCS Bonder Paste LWL as a trowel applied paste between the substrate and the InsulPOX panel.

Clean up: Excess mixed product is best removed from the work area and tools before it hardens. Use of rags and solvents such as acetone or heavy-duty detergents facilitate cleaning. Cured product may be removed from tools by soaking in an epoxy stripper.

Handling and Toxicity: This bulletin does not accompany the product when sold. For hazard warnings, safe handling and first aid instructions, CAREFULLY READ THE MATERIAL SAFETY DATA SHEETS AND CONTAINER WARNING LABELS.
Part A: Liquid epoxy resin, HMIS Health Hazard Rating - 2 (Moderate Hazard). Warning! Causes eye and skin irritation. May cause allergic skin reaction. Harmful if swallowed. Avoid contact with eyes, skin and clothing. Wash thoroughly after handling. Avoid prolonged or repeated contact with skin.
Part B: Liquid epoxy hardener, HMIS Health Hazard Rating - 3 (Serious Hazard). Contains alkaline amines. Danger! Causes severe eye and skin burns. May cause allergic skin and respiratory reaction. Combustible, corrosive. Do not get in eyes or skin or on clothing. Avoid breathing vapor. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling. Keep away from heat and open flame.
Part C: Ceramic microspheres, may contain small quantities of crystalline silica. Use N95 facemask when handling.

TYPICAL PROPERTIES (1)

Property (2)		Test Method	Value
Mix Ratio, A:B:C	by vol		use entire kit
	by wt		100:44:96.7
Color:	Part A	VISUAL	Milky Liquid
	Part B		Milky Liquid
	Part C		Concrete Grey/Tan
	Mixed		Concrete Grey/Tan
Weight per Gallon, lb:	Part A	ASTM D 1475	9.34
	Part B		8.03
	Mixed A+B		8.90
Viscosity, cp:	Part A	ASTM D 2393	425
	Part B		350
	Mixed		400
Gel Time, 1 quart, hours		ASTM D 2471	4.5
Tensile Strength, psi (3)		ASTM D 638	2,200
Tensile Modulus, psi (3)		ASTM D 638	16,000
Elongation at Break, % (3)		ASTM D 638	60
Compressive Strength, psi (3)		ASTM D695	1,750
Bond Strength to		ASTM D 4541	
ASTM C109: Cement Mortar, dry (neat epoxy)			500 (3)
ASTM C109: Cement Mortar, damp (neat epoxy)			430 (3)
Cured InsulPOX, roughened surface, dry (full, mixed system)			70
ASTM C109: Cement Mortar, dry (full, mixed system)			90
Thermal Conductivity, at -260 ^{o}F		ASTM F433	0.043 Btu/hr/ft/^{o}F
(approx. boiling point of LNG)			0.074 W/m/K
Flammability	Mixed A+B+C	ASTM D635	Not Flammable
Density	Mixed A+B+C	ASTM D792	0.768

(1) The properties listed are typical and descriptive of the product and should not be used for specification purposes. For specification preparation, consult ChemCo Systems.

(2) Cure schedule, 7 days at 73° ± 4 F and test temperature, 73° ± 4 F.

(3) Neat resin, no aggregate or Part C added.

(4) Compressive strength of cement mortar, 4500 psi.

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