

INSULPOX™

 ChemCo Systems

Epoxy Cryogenic Insulating Polymer Concrete (IPC)

Boil off hazard reduction for cryogenic
secondary containment in LNG trenches
and sumps



INSULPOX™

ABOUT

InsulPOX is a high-performance epoxy insulating polymer concrete (IPC) composite overlay for cryogenic secondary containment in LNG terminals, dike walls, sumps, and floors.

It is formulated for exterior applications where thermal and trench insulation is required including trench floors and walls and sumps in LNG terminals as well as containment trenches for other cryogenic liquefied gases and sumps. InsulPOX can be employed to reduce asphyxiation risk and cold cloud concerns in liquid oxygen, nitrogen, argon, helium and hydrogen in tight site applications.

FEATURES

- Does not embrittle; stays tough and flexible
- Environmentally safe - 0 VOC solvents
- Excellent resistance to abrasion
- Excellent thermal and mechanical shock resistance
- Long working time allows easy placement
- Non-flammable, UV resistant polymer
- Provides seamless installation
- High compressive strength IPC supports light vehicles
- Can be used to repair other cryogenic insulating materials
- Availability in custom sized precast panels can speed up installation

WHY INSULPOX™

Slows evaporation of spilled LNG by reducing the heat transfer of underlying concrete.

Lowers the airborne concentration of evaporated vapors to avert explosive levels.

Protects concrete from cracking and flexing due to exposure to -260°F (-160°C) LNG liquid.

Protects reinforcing steel from cryogenic embrittlement.

Provides thermal shock protection for concrete and steel, as well as reduces vaporization of liquid hydrocarbons and radiant heat during potential fires.

TECHNOLOGY

Durable, flexible, UV stable, nonflammable epoxy insulating polymer concrete (IPC) system is filled with lightweight ceramic nanospheres and applied in a thickness of ¾-2" (2-5 cm) on concrete.

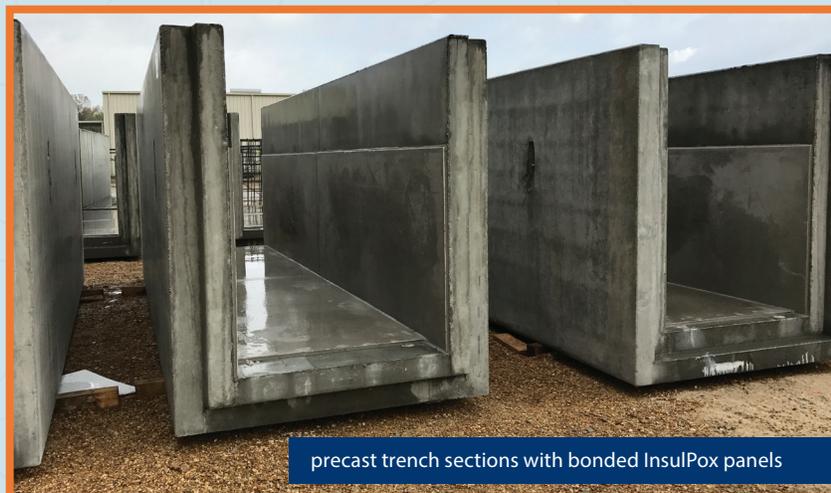
Low modulus epoxy IPC provides toughness and durability.

—It won't shatter when subjected to mechanical or thermal shocks.

Can be installed quickly in 4'x8' precast panels or hand placed in horizontal and formed in vertical applications.



4'x8' panels ready for shipment



precast trench sections with bonded InsulPox panels



CHEMICAL RESISTANCE

InsulPOX 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.

INDEPENDENT LAB TESTING

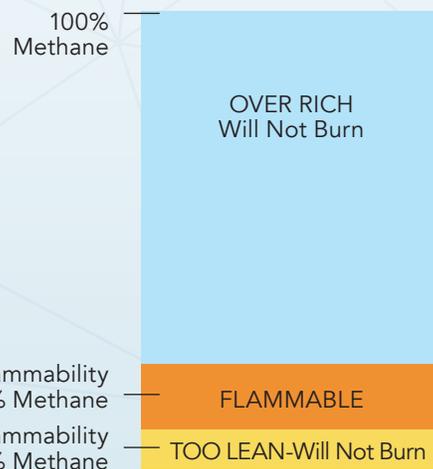
Although we believe our standards and practices produce premium quality products, we use independent testing quality to add assurances to our manufactured products.

LNG vapor has a limited flammability range

The physical and chemical properties of LNG render it safer than other commonly used hydrocarbons.

Lack of oxygen prevents fuel concentrations above the upper flammability limit from burning. An example would be a secure storage tank with and LNG vapor concentration at or near 100 percent methane.

Fuel concentrations below the lower flammability limit cannot burn because too little methane is present. An example would be leakage of small quantities of LNG in a well-ventilated area.



TYPICAL PROPERTIES⁽¹⁾

PROPERTY ⁽²⁾	TEST METHOD	VALUE
Tensile Strength⁽³⁾	ASTM D638	2,200 psi (15.2 MPa)
Tensile Modulus⁽³⁾	ASTM D638	6,000 psi (41.4 MPa)
Elongation at Break⁽³⁾	ASTM D638	60%
Compressive Strength⁽⁴⁾	ASTM D695	5,900 psi (40.7 MPa)
Flexural Strength⁽⁴⁾	ASTM D790	1776 psi (12.2 MPa)
Flexural Modulus⁽⁴⁾	ASTM D790	119800 psi (826 MPa)
Bond Strength to:	ASTM D7234	
Cement Mortar, dry (neat epoxy)		500 psi (3.45 MPa)
Cement Mortar, damp (neat epoxy)		430 psi (2.96 MPa)
Thermal Conductivity, at -260°F (-160°C) (approx. boiling point of LNG)	ASTM F433	0.043 Btu/hr/ft ² /°F 0.074 W/m/K
Flammability (A+B+C)	ASTM D635	Not Flammable
Gel Time, 1 quart	ASTM D2471	4.5 hours
Density (A+B+C)	ASTM D792	0.768

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

(2) Cure schedule, 7 days at 73° ± 4°F (23°C ± 1°C) and test temperature, 73° ± 4°F (23°C ± 1°C).

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

(4) Composite system, including Parts A, B and C

(5) Compressive strength of cement mortar, 4500 psi (31 MPa).



credit: Freeport LNG Development, L.P.

About ChemCo Systems

At ChemCo Systems, we believe that expertise makes all the difference to our customers.

Our staff engineers and chemists average over 25 years of industry experience and many participated in the original development of structural adhesives for concrete repair and restoration. Our team of chemical engineers, chemists, scientists, and technical staff work closely to support field applications.

ChemCo Systems manufactures a diverse selection of polymer systems for use in construction applications. Our products are designed to install, protect or repair architectural and structural concrete, steel, wood as well as both carbon and glass fiber composite systems. Over 100 ChemCo products are available for: structural crack repair, anchor bolts, coatings and sealants, machine bases, old-to-new pours, seismic upgrades, plate bonding reinforcement, spall and void repair, underwater (marine) waterproofing with PU chemical grouts and extreme environments. ChemCo offers custom formulation, compounding, toll manufacturing, and product testing services using ASTM, ACI, ICRI and AASHTO standards.

ChemCo Systems' extensive products are manufactured in strategic locations across the United States including the U.S. Gulf Coast. We manufacture and store an inventory of raw materials and finished goods to serve contractors' needs quickly.

