

CHEM-CRETE® MARINASEAL™ Topical Treatment of Marine Structures for Protection and Durability Solution by Pore Blocking and Lining Against Water, Moisture & Ice

PRODUCT DESCRIPTION

CHEM-CRETE[®] MARINASEAL[™] (MARINASEAL), is a patented Dual Crystalline penetrating sealer for protection and durability solution of Marine structures. It is a water-based and environmentally friendly waterproofing product that combines hygroscopic and hydrophilic crystals for pore-blocking function and hydrophobic material for pore lining. MARINASEAL is a colorless and fast curing product that is applied on surfaces of concrete structures. Its low viscosity allows it to penetrate effectively into Marine and hydrostructures where it reacts yielding an exceptional performance. The produced crystals restrict water permeation through pores via the pore blocking mechanism. Under wet/damped conditions, and upon contact with moisture, the hygroscopic property of the crystals provides a continual crystal growth towards the source of moisture, resulting in permanent moisture blocking at source. Simultaneously, the hydrophilic behavior allows the crystals to swell and fill the pores preventing moisture from passing through. Under dry conditions, the crystals release the moisture in a desorption process that makes the crystals shrink to their original size. The swelling/shrinking process of the crystals will allow treated structures to continually breath. For partially wet concrete surfaces, MARINASEAL provides the treated surface with an excellent water-repelling (hydrophobic) feature that prevents water and contaminants from penetrating into cementitious structures and reduce ice adhesion (iceophobic).



Through these distinguished combined mechanisms, MARINASEAL protects concrete surfaces from the delaminating effects of water, moisture saturation, salts, chloride ions, freeze/thaw cycles and other water-related problems. It provides a solution to all moisture related problems, common wear impacts and wind driven erosion. It solves problems associated with see salts and minerals and dusting. MARINASEAL enhances structural sustainability,

dramatically reduces its maintenance costs and positively affects concrete life cycle.



FIELDS OF APPLICATION

- SEA PORTS
- SEA WALLS
- PIERS
- UNDERWATER TUNNELS

FEATURES, ADVANTAGES & BENIFITS

MARINASEAL has the following advantages

- □ 100% green, environmentally friendly, safe & non-toxic.
- □ Non-film forming surface treatment and can be applied vertically, horizontally and overhead.
- Provides long-lasting internal waterproofing and moisture blocking and hence solves many types of water-associated problems in marine structures.
- Reduces water permeability through concrete structures by 2-3 orders of magnitudes when tested @ 200 psi (1.38 MPa) according to CRD-48-92.
- □ Self-healing: seal cracks up to 1/16th inch (1.5 mm).
- Reduces damage caused by repeated freezing and thawing cycles and minimizes concrete scaling (see Fig.2).



Fig. 1: ASTM C666-97: Freezing & thawing effect on treated & untreated when MARINASEAL is applied on cured concrete samples

- Reduces penetration of chloride ions from de-icing salts & increases concrete electrical resistivity by a percentage over 90%.
- □ Protects reinforcing steel bars against corrosion without negative effects on existing steel cathodic protection.
- □ Increases the density of high porosity concrete by 6-7 % (TX DOT mix-design, w/c=0.5 using ASTM C642-9).
- Reduces damages from Alkali-Silica Reactions (ASR) and silicate dusting
- Decreases surface abrasion.
- Decreases Sulfate attack
- □ Decreases carbonation.
- Provides concrete surface with hydrophobicity characteristics which reduce the absorption of sea water and minimizes surface wetting by sea water, and other contaminants.

PACKAGING

Product	Packaging
CHEM-CRETE MARINASEAL	1 GAL (3.79 LITER) JUG
	5 GAL (18.9 LITER) PAIL
	55 GAL (208 LITER) DRUM
	265 GAL (1000 LITER) TOTE

TECHNICAL DATA

Physical Properties @ 77 °F (25 °F)

Viscosity	< 8 centipoises
Freezing Point	25°F (-3.89°C)
Boiling Point	219°F (104°C)
Color	Clear
Environmental Hazards	None
Drying Time	2 – 3 hours
Odor	None
Toxicity	None
Fumes	None
Flammability	None

Product Performance: MARINASEAL is tested according to the following test standards:

- CRD-48-92 US Army Corps of Engineers Standard Test Method for Water Permeability of Concrete
- □ ASTM D6489-99 Determining the Water Absorption of Hardened Concrete Treated with a Water Repelling Coating.
- □ ASTM C642-97 Standard Test Method for Density, Absorption, and Voids in Hardened Concrete.
- ASTM C642-97 Density, Absorption, and Voids in Hardened Concrete.
- ASTM C1202-91 Electrical Indication of Concrete's Ability to Resist Chloride Ion Penetration.
- □ AASHTO T260 Sampling and Testing for Chloride Ion in Concrete and Concrete Raw Materials.
- AASHTO T277 Electrical Indication of Concrete's Ability to Resist Chloride Ion Penetration.
- □ AASHTO T259-00 Resistance of Concrete to Chloride Ion Penetration.
- □ ASTM C1218 Water-Soluble Chloride in Mortar and Concrete.
- □ ASTM C672-98 Scaling Resistance of Concrete Surfaces Exposed to Deicing Chemicals.
- □ ASTM C457-98 Microscopical Determination of Parameters of the Air- Void System in Hardened Concrete.
- MIL-STD-810G Fungal Resistance According to Test Method Standard for Environmental Engineering Considerations and Laboratory Tests.
- ASTM C666-97 Resistance of Concrete to Rapid Freezing & Thawing.
- ASTM C1567 Standard Test Method for Determining the Potential Alkali-Silica Reactivity of Combinations of

Cementitious Materials and Aggregate (Accelerated Mortar-Bar Method)

APPLICATION DATA

Fully cured or existing concrete: Repair and seal joints, cracks, and voids greater than 1/16th inch prior to application. Concrete surfaces must be clean and sound prior to application of the MARINASEAL. Proper cleaning will open the surface pores and capillaries to enhance the penetration process. Compressed air can be used to remove dust and loose particles from the surface. Flushing the area to be treated with water can improve the cleaning process. However, for heavily contaminated areas special concrete cleaning agents such as Chem-Crete CONCLEAN CCC060 can be used to remove dirt, grease, and oil from those areas.

Coverage: Apply at an average coverage rate of 150-200 ft²/gal $(3.7-4.9 \text{ m}^2/\text{liter})$ in one coat.

Green/Plastic Concrete:

- 1. Only consider an application when concrete finishing is completed and no bleed water is present.
- 2. Concrete should not be in duress and should be curing normally.
- 3. Apply MARINASEAL uniformly and at an average coverage rate of 200 ft²/gallon (4.9 m²/L).
- 4. DO NOT allow the MARINASEAL to puddle or pool.
- Application of membrane forming curing compound within 20 minutes of MARINASEAL application.
- 6. Apply the membrane curing compound at manufacturer's recommended coverage rate.

Limitations: Do not apply MARINASEAL in the following cases:

- □ If concrete surface temperature falls below 40°F (5°C).
- □ If the area has been previously treated with sealing agents unless the sealers are removed by chemical or mechanical means.

CLEANING

All tools and equipment must be cleaned with clean water immediately after use.

STORAGE

Two-year shelf life when stored in its original, unopened container in a cool, dry place. Always agitate the product before using. DO NOT ALLOW PRODUCT TO FREEZE. Repeated freezing and thawing may cause damage to the product.

SAFETY PRECAUTIONS

As with all construction chemical products, adequate precautions and care must be taken during usage and storage. Avoid direct contact with foodstuff, eyes, skin, and mouth. Any contacted areas should be washed thoroughly with clean running water and soap. Always wear protective goggles and gloves. In case of eye contact, flush for fifteen minutes with warm water. If eye irritation persists, seek medical attention. In case of ingestion or swallowing, drink 2 glasses of clean water and seek medical attention. **KEEP OUT OF REACH OF CHILDREN.**

TECHNICAL ASSISTANCE

Please contact International Chem-Crete Corporation for Technical Personnel.

WARRANTY

LIMITED WARRANTY: International Chem-Crete warrants that, at the time and place we make shipment, our materials will be of good quality and will conform to our published specifications in force on the date of acceptance of the order.

DISCLAIMER: The information contained herein is included for illustrative purposes only, and to the best of our knowledge, is accurate and reliable. International Chem-Crete cannot, under any circumstances, make any guarantee of results or assume any obligation or liability in connection with the use of this information.

As International Chem-Crete has no control over product usage, it is recommended that the product be tested to determine suitability for a specific application and/or that our information is valid in a particular circumstance. Responsibility remains with the architect or engineer, contractor and owner for the design, application and proper installation of each product. Specifier and user shall determine the suitability of products for specific application and assume all responsibilities in connection therewith. Any liability is limited to the replacement of material if proven faulty. AM010125-1

Manufactured By:



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