

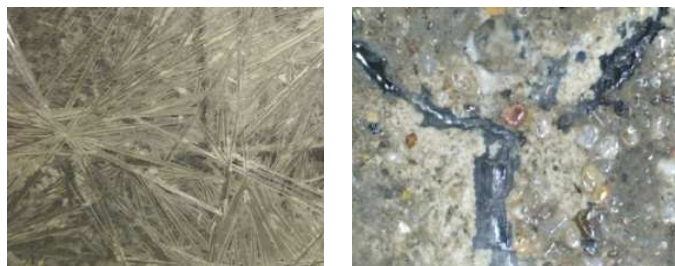


# CHEM-CRETE® PAVIX® CCC100

**Concrete Protection Against Water, Moisture & Ice and Durability Solution by Pore Blocking and Lining Using Topical Treatment for Green & Cured Concrete for Airports, Highways & Bridges Structures**

## PRODUCT DESCRIPTION

Chem-Crete® PAVIX® CCC100, is a patented Dual-Crystalline, penetrating concrete and masonry sealer. 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. It is designed to protect surfaces from the delaminating effects of water, moisture saturation, freeze/thaw, Alkali Silica Reactions (ASR), chloride-ion penetration and ice adhesion. PAVIX is ideal for exterior or interior concrete and masonry surfaces and can be applied to both positive or negative hydrostatic pressure sides of concrete. PAVIX enhances concrete sustainability, significantly reduces maintenance costs and increases concrete and masonry life cycles.



## FIELDS OF APPLICATION

- Airports
- Tunnels
- Ports
- Concrete rail ties
- Retaining walls
- Parking surfaces & structures
- Highways
- Bridge structures
- Concrete structures
- Sidewalks & drives
- Precast & tilt concrete

## FEATURES, ADVANTAGES & BENIFITS

- Can be used on green (fresh) and cured concrete.
- Provides long-lasting internal waterproofing and moisture blocking from positive and negative sides.
- Reduces water permeability through concrete by 2-3 orders of magnitudes when tested @ 200 psi (1.38 MPa) according to CRD-48-92.
- Provides concrete surface with Hydrophobicity characteristics: Excellent water-repelling properties that help prevent water, jet fuel, and oil from wetting and saturating concrete surfaces: PAVIX increases water contact angle for concrete surfaces by greater than 90°, see Fig. 1).

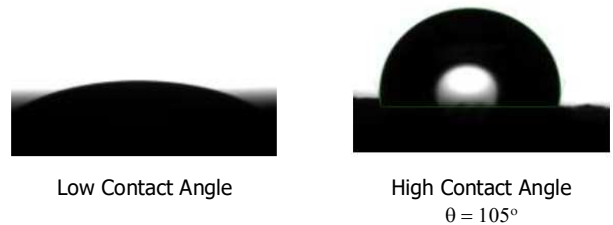


Fig. 1: Water contact angles ( $\theta$ ) for concrete surfaces comparing control (left) & PAVIX-treated (right) using TX-DOT pavement mix design at w/c=0.47

- Reduces damages from Alkali-Silica Reactions (ASR) and silicate dusting (see Table 1).

**Table 1:** Percentage reduction in length change due to ASR according to ASTM C1567 using Iowa DOT C4-WRC20 concrete mix design at various w/c ratios

Type of Aggregate	w/c ratio		
	0.39	0.43	0.47
Non-Reactive (Ames Mine)	43	42	26
Reactive (Platte River)	28	20	24

- Reduces ice adhesion (shear testing) by up to 90% (see Fig. 2) and hence reduces the consumption of deicing salts by 50-60%.

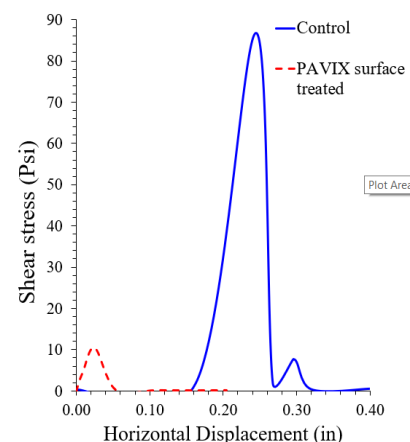


Fig. 2: Ice Adhesion Test Results comparing control (blue) & PAVIX-treated (red) using TX-DOT pavement mix design at w/c=0.43 using Modified Direct Shear Apparatus (Geocomp SHERA-Trac-II)

- Reduces damage caused by repeated freezing & thawing cycles (see Fig. 3).

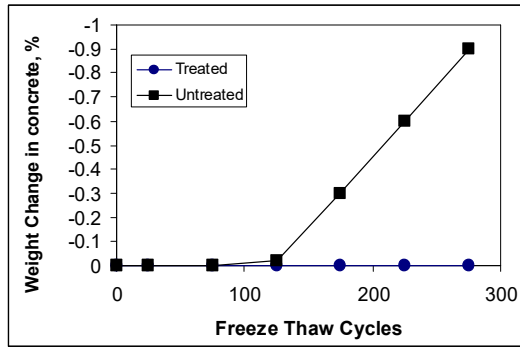


Fig. 3: ASTM C666-97: Freezing & thawing effect on treated & untreated when PAVIX applied on cured concrete samples

- Reduces penetration of chloride ions from de-icing salts & increases concrete electrical resistivity by a percentage over 90% (see Table 2).

**Table 2:** Total charge passed & percentage reductions from results using ASTM C1202 on Iowa DOT C4-WRC20 Concrete Mix Design with w/c ratio=0.4

Parameter	Control	PAVIX @ NaCl Side	PAVIX @ NaOH Side	PAVIX @ Both Sides (NaOH & NaCl)
Charge Passed (Coulombs)	646	13	18	60
% Reduction		98%	97%	90%

- Minimizes concrete scaling due to freezing and thawing in the presence of deicing chemicals (see Fig. 4-a & Fig. 4-b).

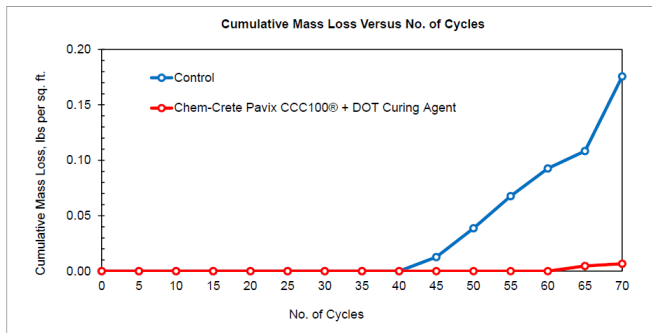


Fig. 4-a: ASTM C672-98: scaling resistance when PAVIX is applied on green concrete surfaces exposed to deicing chemicals, this test shows 94% reduction in mass loss at 70 Freeze-Thaw cycles.



Control sample without PAVIX and curing compound      Sample with PAVIX and curing compound

Fig. 4-b: concrete lab samples show scaling effect on PAVIX treated and untreated concrete surfaces after 70 cycles of freezing & thawing

- Protects reinforcing steel bars against corrosion without negative effects on existing steel cathodic protection.
- Self-healing: seal cracks up to 1/16<sup>th</sup> inch (1.5 mm).
- Prevents or minimizes early joint failure or deterioration.
- Maximizes joint sealant adhesion by reducing moisture content.
- Helps concrete stay whiter & brighter (Albedo Surface).
- Eliminates fungal and microbial growth according to anti-fungal and microbial test method MIL-SDD810G.
- Increases concrete density of high porosity concrete specimen by 6-7 % (TX DOT mix-design, w/c=0.5 using ASTM C642-9).
- Increases coating adhesion by 13% (ASTM D7234 using high porosity, moderate-strength laboratory concrete specimen, w/c=0.48).
- 100% green, environmentally friend, safe & non-toxic.
- Can be applied vertically, horizontally and overhead.

## PACKAGING

Product	Packaging
CHEM-CRETE PAVIX CCC100	1 GAL (3.79 LITER) JUG
	5 GAL (18.9 LITER) PAIL
	55 GAL (208 LITER) DRUM
	275 GAL (1040 LITER) TOTE

## TECHNICAL DATA

### Physical Properties @ 77 °F (25 °F)

Specific Gravity	1.1 – 1.2
Viscosity	2.4 centipoises
Freezing Point	25°F (-3.89°C)
Boiling Point	219°F (104°C)
Color	Clear
Environmental Hazards	None
Drying Time @ 77°F (25°C)	2 – 3 hours
Odor	None
Toxicity	None
Fumes	None
Flammability	None

**Product Performance:** PAVIX 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 D7234 Pull-Off Adhesion Strength of Coatings on Concrete.

- ❑ ASTM D4541-95 Pull-Off Strength of Coatings Using Portable Adhesion Testers.
- ❑ ASTM C1583 Bond Strength or Tensile Strength of Overlay Materials by Direct Tension.
- ❑ ASTM F609-96 Standard Test Method for Using a Horizontal Pull Slipmeter (HPS).
- ❑ ASTM E303-93 Measuring Surface Frictional Properties Using the British Pendulum Tester.
- ❑ ASTM D7234 Standard Test Method for Pull-Off Adhesion Strength of Coatings on Concrete Using Portable Pull-Off Adhesion Testers.
- ❑ 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

**Limitations:** Do not apply PAVIX 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.

### **Application:**

**Fully cured or existing concrete:** Repair and seal joints, cracks, and voids greater than 1/16<sup>th</sup> inch prior to application. Concrete surfaces must be clean and sound prior to application of the product. 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 ft<sup>2</sup>/gal (3.7-4.9 m<sup>2</sup>/liter) in one coat.

### **Green/Plastic Concrete:**

1. Only consider an application when concrete finishing is completed and the disappearance of bleed water.
2. Concrete should not be in duress and should be curing normally.
3. Apply PAVIX uniformly and at an average coverage rate of 200 ft<sup>2</sup>/gallon (4.9 m<sup>2</sup>/L).
4. DO NOT allow the PAVIX to puddle or pool.
5. Application of membrane forming curing compound within 20 minutes from the initial PAVIX application.
6. Apply the membrane curing compound at manufacturer's recommended coverage rate.

## CLEANING

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

## STORAGE

PAVIX must be stored under room temperature. Cold temperatures may cause the product to crystallize. Shelf life is two years in its original unopened packaging. Do not allow product to freeze.

## 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 direct contact with skin should be washed thoroughly with clean running water and soap.

Always wear protective goggles and gloves. In case of eye contact, flush for 15 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 Inc. 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 Inc. is not under any circumstances liable to connection with the use of information. As International Chem-Crete Inc. has no control over the use to which others may put its products, it is recommended that the products be tested to determine the suitability for specific applications and/or our information is valid in particular circumstances. Responsibility remains with the architect or engineer, contractor and owner of the design, application, and proper installation of each product. Specifier and user shall determine the suitability of the product for specific application and assume all responsibility in connection therewith. AM010322-01

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