Pavement Technology, Inc. 800-333-6309 www.pavetechinc.com

Litho1000Ti® pollution-reducing concrete sealer/hardener

Litho1000Ti® pollution-remediating concrete sealer/hardener waterproofs and restores aging and newer concrete, sealing it against chloride ion penetration, deicing salts, sea-water environments and freeze/thaw cycling, while improving its durability and reducing vehicular exhaust pollutants. Its air-purifying surface perpetually regenerates itself throughout the life of the concrete, resisting weathering, stain and traffic-related wear while contributing to compliance with U.S. EPA's stringent new National Ambient Air Quality Standard (NAAQS). Technical assistance is available from the manufacturer and its trained field representatives.

Markets

- Bridges
- DOTs
- Urban/Suburban Municipalities and Counties
- Airports

Compatible Substrates

Concrete surfaces of any age, including:

- Pavements
- Bridge Decks
- Parapet Walls
- PCC Paving
- Parking Decks
- Pre-Cast Concrete
- Vertical Cast-in-Place Concrete

Benefits

- Seals and waterproofs concrete surfaces, significantly reducing the concrete's permeability and sorptivity
- Improves the hardness of the concrete aggregate and paste matrix
- Provides a self-cleaning, self-regenerating, air-purifying surface that removes nitrogen oxides (NO_X), volatile organic compounds (VOCs) and other airborne pollutants from the atmosphere for the life of the structure
- Increases the surface durability of pavements and bridge decks
- Contributes to the higher abrasive value of exposed aggregate
- Will not impede the bonding properties of joint sealants, patching materials, lane markers or paint striping
- Will not stain, discolor or darken concrete, alter or coat its surface texture or alter its skid number (SN) rating
- Compatible with traffic paint, striping, cementitious toppings, joint sealants, crack repair processes and typically applied paint and coating systems

How It Works

Litho1000Ti concrete sealer/hardener is a water-based lithium silicate with titanium dioxide added in a proprietary formula in solution to remediate airborne pollutants. It requires no mixing or diluting and contains no VOCs or solvents.

The proprietary Litho1000Ti formulation chemically alters the absorptive aggregate of concrete to increase its durability. Unlike topical sealers that merely coat the top surface of the concrete, the lithium silicate in Litho1000Ti sealer/hardener reacts with the hydrating cement to produce additional gel products near the concrete surface. These added gel products create an in-depth seal by filling the concrete capillaries that would otherwise allow water to penetrate through the concrete surface.

As an added benefit, the gel delivers photocatalytic titanium dioxide (TiO_2) deep into the concrete structure. The resulting air-purifying surface reduces pollutants related to vehicular exhaust. As surface layers deteriorate through exposure to weather and traffic, submerged layers of TiO_2 are newly exposed, perpetuating the air purification process.

How to Apply

Temperature

Apply only when ambient temperature is above freezing. Product that has frozen will not function properly and must be discarded.

Surface Preparation

Surface must be clean and dry.

Application Method/Rate

Litho1000Ti sealer/hardener is available in 55 gallon drums and 275 gallon totes and shall be spray applied to obtain uniform coverage over the concrete.

- Most concrete surfaces, such as bridge decks and pavements, require two equal applications of Litho1000Ti sealer/hardener. Typical application range is between 90 and 150 square feet per gallon – 2 coats required.
- Pre-cast concrete and vertical cast-in-place concrete require a single spray coat. Typical application range is between 125 and 200 square feet per gallon – 1 coat required.

After application, rinse equipment clean with water. No special maintenance of treated concrete is required.

Other Considerations

- Store in a cool, dry area out of direct sunlight.
- Keep in tightly secured containers to prevent evaporation and contamination.
- Six month shelf life
- Do not freeze

Limited Warranty

Pavement Technology, Inc. (PTI) warrants its products to be of the highest quality. Refund of purchase price or replacement of product shall constitute the limit of PTI's liability. PTI makes no other warranties, express or implied, with respect to the products or any service and disclaims all other warranties, including any warranty of merchantability and fitness for particular purpose. This limited warranty may not be modified by reps of PTI, its distributors or dealers.

(continued)

Specifications/Testing

Litho1000Ti pollution-remediating sealer/hardener testing has been performed to prove its superior performance and to ensure a close and consistent correlation between laboratory and field results.

AASHTO T 259 Test: Chloride Ion Penetration Resistance

(Salt Water Ponding – 90 days)

Average Absorbed Chloride Content (lbs/cu.yd.)

Sample Depth	Linseed	Litho1000Ti	Improvement
1/16-1/2 in.	4.98	2.50	49.8%
1/2-1 in.	0.34	0.04	88.2%

ASTM C 501 Test: Relative Resistance To Wear

(Nominal 3000 psi concrete after 1000 revolutions)

Specimen	Avg. Abrasive Wear Index	Avg. Depth of Wear	Avg. Absolute Weight Loss
Treated	27.4	.026 in.	3.227 gm
Untreated	19.9	.033 in	4.525 gm
Improvement	37.7%	21.2%	28.7%

ASTM C 131 Test: Abrasion Resistance

(Los Angeles Abrasion Test)

(Limestone aggregate soaked in Litho1000Ti)

Sample	Untreated	Litho1000Ti 1 hour	Litho1000Ti 24 hours
100 rev. loss	6.1%	3.9%	3.9%
500 rev. loss	27.5%	23.2%	22.6%

HYDROSTATIC PRESSURE TEST

(Applied Pressure: 100 psi – 24 hour duration)

Property	Untreated	Treated with Litho1000Ti
Absorption	120 ml	7 ml

ASTM C 882 Test:

Epoxy-Resin System Bond Strength To Concrete

Test results shall demonstrate bond strength of treated samples equal to untreated samples used as a control.

ASTM C 672 TEST: Scaling Resistance

(Non-Air Entrained Concrete after 50 Freeze/Thaw Cycles)

	Untreated	Treated with Litho1000Ti
Scaling	Light to Moderate (2+)	None (0)

ASTM C 1202-94/AASHTO T 277 Test:

Rapid Chloride Permeability (28 Days)

Total charge passed (Coulombs)

Sample	Unsealed	Treated with Litho1000Ti
1	3999	2000
2	4027	2914
3	3981	3012
Average	4002	2971

Average Improvement 26%

AASHTO T 161/ASTM C 666

Test: Rapid Freeze/Thaw Cycle Resistance

Cycles	Untreated	Treated with Litho1000Ti
146	Slight	None
237	Slight	None
490	Slight	None

ASTM C 944-12 Test:

Abrasion Resistance Of Hardened Concrete & Mortar

(6 in. x 8 in. specimen, air cured, sand blasted, 22.0 lb. load)

Property	Untreated	Treated with Litho1000Ti
Abrasion Loss (110 day)	14.0 gm	10.1 gm

AASHTO T 2590 Test: Depth Of Penetration

*Depth of penetration shall be a minimum of 1/8 in. as demonstrated by successful testing in accordance with **AASHTO T 2590** - based on unbraided specimens.*

Specifications/Testing[1]

The Texas A&M Transportation Institute, using samples of Litho1000Ti concrete sealer/hardener, studied the application of this Ti-enhanced formulation to concrete pavement surfaces to impart air pollution remediation properties. The objective of this experimental program was to evaluate the effectiveness of photo catalytic concrete samples for removing atmospheric NOx gases. For this purpose, several factors were tested, such as the concentration of TiO_2, the curing method, and the mix design. Specimens were prepared with two different mix proportions by varying the w/cm (0.42 and 0.48). Results showed that after 30 days, the samples treated with Litho1000Ti concrete sealer/hardener had NOx reductions ranging from 32 to 42 percent. In addition, samples with higher w/cm values had better performance in removing NOx, while the NOx reduction efficiency of the control sample was negligible.

1 Laboratory Investigation of the Effect of TiO2 Topical Treatments on Concrete Specimens (Phase I) - Texas A&M Transportation Institute, September 2018..

Safety Guidelines

Contractors shall follow all stipulated application requirements.

Manufacturer and National Distributor

Pavement Technology, Inc., Westlake, OH

Patents: US 9,493,378 B2

Made and Sourced in America

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