



Real Science.
Real Results.

PlusTi™
Smog Eating Roads

A Better Way to Get There

Pavement Technology, Inc.

800-333-6309

www.pavetechinc.com

Litho1000^{Ti}® pollution-reducing concrete sealer/hardener

The PlusTi™ family of smog-eating road penetrants includes Litho1000^{Ti}® pollution-reducing concrete sealer/hardener. This concrete sealer/hardener reduces the capillaries to minimize water absorption, 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, reducing vehicular exhaust pollutants and mitigating Urban Heat Island Effect (UHI). Its air-purifying surface regenerates itself, 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.

- Bridges
- DOT Roadways
- Airports
- Urban/Suburban Municipalities and Counties

Markets

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

Compatible Substrates

Concrete surfaces of any age, including:

Benefits

- Seals and reduces the capillaries of 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 and heat-reducing surface that removes nitrogen oxides (NO_x), volatile organic compounds (VOCs) and other airborne pollutants from the atmosphere surrounding the structure
- Increases the surface durability of pavements, runways and bridge decks
- Contributes to the higher abrasive value of exposed aggregate



PlusTi Litho 1000^{Ti}® concrete sealer/hardener application

- Provides a quick-drying super-hydrophilic surface
- Creates a UV-protected pavement that meets USGBC LEED for Urban Heat Island mitigation
- Captures and removes up to 60% of toxic airborne vehicular emissions
- 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

PlusTi Litho1000^{Ti} concrete sealer/hardener is a water-based lithium silicate with photocatalytic-grade titanium dioxide added in a proprietary formula in solution to remediate airborne pollutants and reduce UHI. It requires no diluting and contains no VOCs or solvents.

The proprietary PlusTi concrete sealer/hardener 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 PlusTi concrete 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 PlusTi concrete sealer/hardener delivers photocatalytic titanium dioxide (TiO₂) 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 TiO₂ 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

PlusTi concrete sealer/hardener is available in 55 gallon drums and 250 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 PlusTi concrete 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

(continued)

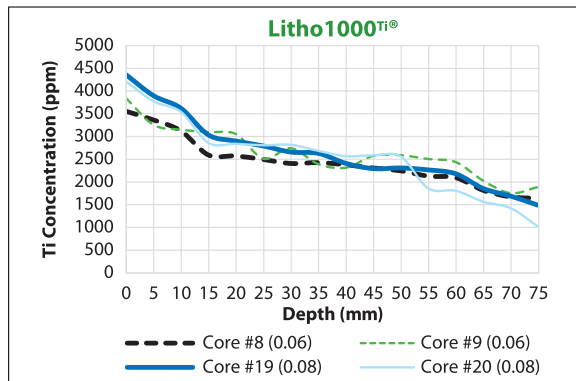
Limited Warranty

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.

Specifications/Testing¹

Litho1000TM pollution-remediating sealer/hardener testing has been conducted to prove its superior performance and to ensure a close and consistent correlation between laboratory and field results.

TiO₂ Penetration Orlando International Airport



Source: Texas A&M Transportation Institute (TTI)

Depth of Penetration

Samples treated with Litho1000TM concrete sealer/hardener showed both high concentrations of photocatalytic grade TiO₂ at the surface and well below wearing-course depth.²

TiO₂ Impact on Skid Resistance and Hydrophilic Implications

Litho1000TM

Location / Rate gsy	Pre-Application	Post 20 Minutes	Post 24 Hours
Indian Trail WB / 0.03	43	41	44
Indian Trail WB / 0.06	43	47	50

Source: International Cybernetics Corp.

NO_x Reduction Orlando International Airport and Charlotte County (FL)

Site	NO Reduction Efficiency (%)				
	Control Sample	A.R.A.-1 Ti* Sample A	A.R.A.-1 Ti* Sample B	Litho1000 TM Sample A	Litho1000 TM Sample B
Orlando International	NEGL	45%	43%	53%	57%
Charlotte Co. (FL)	NEGL			42%	46%

Compound	NO Reduction Efficiency (%)			
Application Rate		0.04 gsy	0.06 gsy	0.10 gsy
Litho1000 TM	NEGL	46%	55%	48%

Source: Texas A&M Transportation Institute (TTI)

NO_x Reduction Efficiency

Results showed that the samples treated with Litho1000TM concrete sealer/hardener had NO_x reductions ranging from 40 to near 60 percent. In addition, samples with higher w/cm values had better performance in removing NO_x, while the NO_x reduction efficiency of the control sample was negligible.³

Solar Reflectance

(a) Orlando International Airport and (b) Charlotte County (FL)

Compound/Substrate	Solar Reflectance Index Value (SRI)					
Application Rate (a)	Control Sample	Control Sample	0.10 gsy	0.10 gsy	0.08 gsy	0.08 gsy
Litho1000 TM / Concrete	24	24			38	38
Application Rate (b)	Control Sample	0.03 gsy	0.06 gsy			
Litho1000 TM / Concrete	25	41	46			

Source: Texas A&M Transportation Institute (TTI)

Solar Reflectance Value

Results showed that the samples treated with Litho1000TM concrete sealer/hardener had SR value improvements ranging from 55 to 85 percent, placing all Litho1000TM treated concrete surface courses well above USGBC LEED for UHI.^{4 5 6}

1 The Texas A&M Transportation Institute, using samples of Litho1000TM 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 NO_x gases. For this purpose, several factors were tested, such as the concentration of TiO₂, 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 Litho1000TM concrete sealer/hardener had NO_x reductions ranging from 32 to 42 percent. In addition, samples with higher w/cm values had better performance in removing NO_x, while the NO_x reduction efficiency of the control sample was negligible.

2 Zollinger DG and Joshaghani A, Texas A&M Transportation Institute, Follow-up, May 2019.

3 Zollinger DG and Joshaghani A, Laboratory Investigation of the Effect of TiO₂ Topical Treatments on Concrete and Asphalt Samples, Texas A&M Transportation Institute, September 2018.

4 Japanese Industrial Standard (JIS) TR Z 0018 Photocatalytic Materials – Air Purification Test Procedure.

5 Zollinger DG and Joshaghani A, Solar Reflectance Analysis of TiO₂ Penetrant Treatments on Concrete and Asphalt Samples, Texas A&M Transportation Institute, August 2019.

6 U.S. Green Building Council USGBC, LEED V4 Heat Island Reduction (HIR) via Solar Reflectance Index (SRI) > 50% 29, www.usgbc.org.

Safety Guidelines

Contractors shall follow all stipulated application requirements.

Manufacturer and National Distributor

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Patents: US 9,493,378 B2



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