



LYTHIC

Engineered Chemicals for Polished Concrete Professionals

LYTHIC

Introduction to Lythic

Colloidal Silica

Densifier

Densifier XL

Protector

SPD Protector

Cleaner

Polished Concrete

Concrete Flooring

Maintenance

www.lythic.com

Lythic discovered reactive Colloidal Silica as a new way to add strength and durability for polished concrete floors and the company was launched in 2004.

In 2013 Lythic and Solomon Colors joined forces to represent Lythic products. The innovative Lythic technology continued to gain national and international success with polished concrete contractors.

Solomon Colors acquired Lythic at the end of 2014. Taking ownership of the technology, manufacturing, sales and marketing.

Lythic is still expanding into new markets and remains the market leader in Colloidal Silica chemistry for polished concrete, concrete densification and dust proofing.



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Introduction to *Lythic*

Colloidal Silica

Densifier

Densifier XL

Protector

SPD Protector

Cleaner

Polished Concrete

Concrete Flooring

Maintenance

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The Heart of Lythic Technology

Colloidal Silica is at the heart of **Lythic** technology. It is a pure silica that reacts with the chemistry of concrete to produce more cementitious material, translating into denser concrete with greater strength.

Concrete is a mixture of Portland cement, water and aggregate. Water reacts with Portland cement (*"cement hydration"*), forming a new substance called CEMENT PASTE. At first, it is soft or liquid, but hardens within a few hours into crystal-like mineral structures. This hardening occurs because of chemical changes, not because of drying.

Cement paste binds the aggregate together to form concrete. The "active ingredients" that do the binding are called CALCIUM SILICATE HYDRATES (*C-S-H*). Concrete strength is determined by the strength of the cement paste. Aggregate adds strength mechanically, but it depends on the paste holding it in place.

CALCIUM HYDROXIDE, commonly called lime, is a by-product of hydration that can make up as much as 25% of the cement paste. It does not add strength, has no beneficial effects and can cause discoloration (*"EFFLORESCENCE"*) or damage under some conditions. Calcium hydroxide is the main cause of concrete dusting.

LYTHIC

Introduction to Lythic

Colloidal Silica

Densifier

Densifier XL

Protector

SPD Protector

Cleaner

Polished Concrete

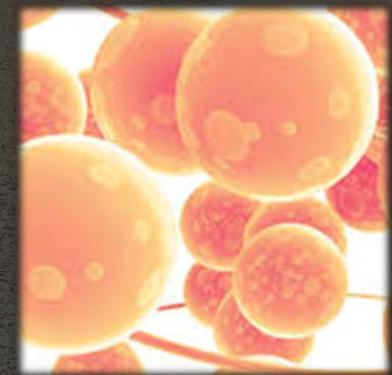
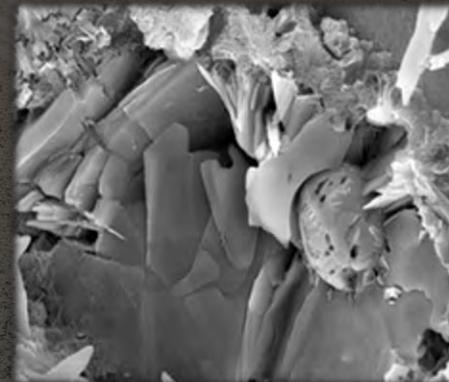
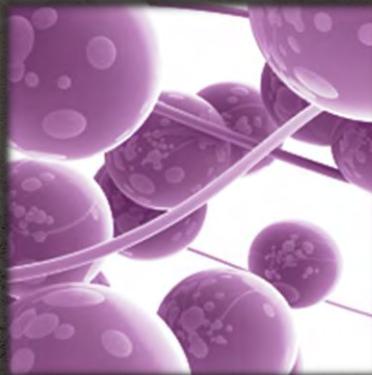
Concrete Flooring

Maintenance

POZZOLANS are substances that react with calcium hydroxide to form additional C-S-H, most of which (*FLY ASH, SILICA FUME*), can only be added to concrete while it is being mixed. Colloidal silica densifiers are pozzolans that can be added to the surface of concrete after it has hardened ("cured"). They penetrate the surface pores of the concrete, react with lime found there to make new C-S-H, hardening the top layer.

Colloidal silica can be added to concrete after it has hardened or while it is fresh. It is virtually pure, nano-scale silica particles suspended in a liquid. It reacts very efficiently and leaves virtually no residue. It bonds to concrete and to itself, achieving a fast buildup of hard material.

Other densifiers are silicates, combinations of silica with mineral salts or metallic hydroxides (*sodium, potassium, or lithium*). They do not react as efficiently as pure nano-sized silica, and the salt residues can create problems. They are also more alkaline (*caustic*) than colloidal silica, making them more dangerous to handle and invoking hazardous waste rules in some locations.



LYTHIC

Introduction to *Lythic*

Colloidal Silica

Densifier

Densifier XL

Protector

SPD Protector

Cleaner

Polished Concrete

Concrete Flooring

Maintenance

www.lythic.com

Lythic Densifier

Lythic Densifier with reactive colloidal silica is 99.5% pure silica, suspended through a proprietary "green" manufacturing process in an ultra-low surface tension liquid, allowing for greater penetration.

It reacts with concrete to increase surface density, making it less permeable to liquids and improving impact and abrasion resistance. Lythic nano-sized silica particles react with lime and bond directly to silica already in the concrete. Silica bonding results in greater hardening than standard densification.

Reactive colloidal silica bonds and hardens decorative cementitious overlays that are low-lime and do not react well with sodium, lithium or potassium silicates.

FEATURES & BENEFITS:

- 5 Nanometer Particle Size
- Deep Capillary Penetration
- Saves time and labor
- No hazardous waste removal
- Prevents dusting and increases durability
- Reacts within minutes
- No surface residue to scrub off
- No whitening when dry
- Low viscosity for quicker penetration
- Safer pH level (less than 10 pH)
- Will not contribute to alkali-silica reaction (ASR)
- Concentrate and ready-to-use formulates

Concrete Condition	Coverage Rate US Gal	Coverage Rate Liter
High Porosity Concrete	250 - 400 sf ²	6.1 - 9.8 m ²
Medium Density Concrete	300 - 500 sf ²	7.4 - 12.3 m ²
Hard Concrete	400 - 600 sf ²	9.8 - 14.7 m ²
High Density Concrete	500 - 700 sf ²	12.3 - 17.2 m ²

LYTHIC

Introduction to *Lythic*

Colloidal Silica

Densifier

Densifier XL

Protector

SPD Protector

Cleaner

Polished Concrete

Concrete Flooring

Maintenance

www.lythic.com

Lythic Densifier XL

Lythic Densifier XL offers the same chemistry as Lythic Densifier with a larger particle size of 50 nanometers.

The larger particle produces a longer reaction time and works well with high porosity concretes.

Paste and cream finishes are becoming more popular Lythic Densifier XL can be used as a spiff coat during the burnishing process without leaving scoping or visible patterns from the tooling.

As with both Lythic Densifier and Densifier XL there is no residue to be removed. Colloidal Silica will penetrate, gel, react and not leave a film.

FEATURES & BENEFITS:

- 50 Nanometer Particle Size
- Near Surface Capillary Penetration
- Saves time and labor
- No hazardous waste removal
- Prevents dusting and increases durability
- Reacts within minutes
- No surface residue to scrub off
- No whitening when dry
- Low viscosity for quicker penetration
- Safer pH level (less than 10 pH)
- Will not contribute to alkali-silica reaction (ASR)
- Concentrate and ready-to-use formulates

Concrete Condition	Coverage Rate US Gal	Coverage Rate Liter
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Lythic Protector

Lythic Protector improves on the effectiveness offered by traditional stain protectors by bonding additional silica to the concrete, further hardening the surface.

Lythic Protector enhances color and creates depth of shine. It cures for foot traffic within hours and improves traction of polished surfaces in both dry and wet conditions.

Lythic Protector is available in Lythic Red Concentrate formula only. Although the product can be used directly as Ready-to-Use or 1:1 dilution depending on the floor condition.

FEATURES & BENEFITS:

- Extends stain resistance
- Enhances color
- Increases shine and reflectivity
- Provides durable traffic-wear resistance
- Improves traction
- works well burnished or not
- Simplifies maintenance
- Concentrate formula
- Multiple applications over prolonged periods

Introduction to *Lythic*

Colloidal Silica

Densifier

Densifier XL

Protector

SPD Protector

Cleaner

Polished Concrete

Concrete Flooring

Maintenance

www.lythic.com

Lythic Protector Formula	Coverage Rate US Gal	Coverage Rate Liter
Mixed 1:1	1200 - 1800 sf ²	37 - 49 m ²
Used As Concentrate	600 - 900 sf ²	18.5 - 24.5 m ²



Lythic SPD Protector

Lythic SPD Protector utilizes new protection technology that achieves resistance to stains, acid etching, and liquid penetration similar to epoxy coatings, while remaining breathable. SPD (*Silica-Polymer-Dispersion*) is a two-part polymer combined with nano-sized colloidal silica.

SPD bonds in very thin coats directly to the concrete, enhancing color, and providing significantly greater protection and longer service life than conventional stain protectors, while retaining the appearance of polished concrete.

FEATURES & BENEFITS:

- High performance coating
- Advanced stain protection
- Elevated chemical resistance
- Durable traffic-wear resistance
- High traction rating from the National Floor Safety Institute
- Dries clear
- Will not yellow over time
- Bonds to highly polished concrete
- Simplifies future maintenance

Introduction to *Lythic*

Colloidal Silica

Densifier

Densifier XL

Protector

SPD Protector

Cleaner

Polished Concrete

Concrete Flooring

Maintenance

www.lythic.com

Lythic SPD Protector	Coverage Rate US Gal	Coverage Rate Liter
One Mixed Gallon	1000 - 1500 sf ²	24.5 - 36.8 m ²
One Kit (2 Gallons Mixed)	2000 - 3000 sf ²	49 - 73.6 m ²

LYTHIC

Introduction to *Lythic*

Colloidal Silica

Densifier

Densifier XL

Protector

SPD Protector

Cleaner

Polished Concrete

Concrete Flooring

Maintenance

www.lythic.com

Lythic Cleaner

Cleaning a concrete floor does more than simply maintain appearance and hygiene; it is vital to the continued performance of the finish. Dirt and grit must be removed so they don't become abrasives that compromise the stain protection layer.

Lythic Cleaner goes beyond cleansing by adding silica to the surface as it cleans. Reactive colloidal silica bonds to concrete, so every cleaning improves resistance to abrasion and liquid penetration. It is chemically matched to Lythic stain protection products for complete compatibility.

Sold as a concentrate, mild but effective, it is ideally suited for everyday use and is the best investment in maintaining a polished concrete floor finish.

FEATURES & BENEFITS:

- Mild, safe, and non-corrosive
- Maintains and replenishes concrete protection
- Adds silica during cleaning
- Removes abrasive materials
- Simplifies maintenance
- Water-based, environmentally friendly
- Improves traction
- Concentrate formula

Concrete Condition	Concentration / Mixing Ratio
Spot Cleaning	Concentrate
Hand Mopping	16:1
Auto Scrubber	32:1
High Density Concrete	500 - 700 sf ²

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Introduction to *Lythic*

Colloidal Silica

Densifier

Densifier XL

Protector

SPD Protector

Cleaner

Polished Concrete

Concrete Flooring

Maintenance

www.lythic.com

Polishing concrete involves three factors:

Mechanical Equipment

Equipment designed for grinding and polishing horizontal surfaces. The correct speed and head pressure is can make all the difference to the overall surface.

Abrasive Tooling

The nature of concrete presents a wide scope of variables in the sand, aggregate, cements and admixtures. Therefore there is equally as many alternative abrasive tools for cutting, grinding, honing and polishing concrete. Finding the right tooling for the concrete condition is essential.

Chemical Enhancement

A polished concrete surface will not stand up to the test of time without the chemical process, protection or cleaners. Lythic Colloidal Silica technology offers the most reactive pure treatment fully engineered systems to ensure long-term service life of polished concrete.



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Introduction to *Lythic*

Colloidal Silica

Densifier

Densifier XL

Protector

SPD Protector

Cleaner

Polished Concrete

Concrete Flooring

Maintenance

www.lythic.com

Industrial Concrete Floors

Untreated industrial concrete floors will always be subject to dusting, wear patterns and other potential surface durability issues.

Preventing future problems starts with Lythic Densifiers as early as the same day of concrete placement or anytime thereafter.

When an concrete surface is hardened using Lythic Colloidal Silica the floor will develop long-term durability, reflectivity and resistance to liquid penetration.

Extending service life, increasing reflectivity and reducing the overall maintenance cost allows owners financial benefits that far out weigh the up front cost of hardening and densification.



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Introduction to *Lythic*

Colloidal Silica

Densifier

Densifier XL

Protector

SPD Protector

Cleaner

Polished Concrete

Concrete Flooring

Maintenance

www.lythic.com

Smart Choice Maintenance

Floor maintenance is something that is overlooked in most cases. General cleaning chemicals are either too aggressive which is harmful to an exposed concrete floor such as polished concrete or chemical hardened industrial floors. Or simply just a fragrant formula water solution.

Lythic Cleaner is a carefully balanced of pH neutral cleansing agents and colloidal silica. Used in concentrate formula for stubborn stains and at 32:1 dilution for daily cleaning.

Lythic Cleaner continues adding reactive colloidal silica to the floor during regular maintenance. Lythic Cleaner will enhance stain resistance, increase reflectivity and overall performance of the floor.



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Project: Under Armour Retail Store #2
Profile: Lythic Polished Concrete Products
Materials: Lythic Densifier
Lythic Protector
Lythic Cleaner

Location: China

Overview: Under Armour is rapidly expanding with retail outlets across the world. The bold and dynamic store designs are aimed to keep visitors entrenched in the shopping experience. At the same time functionality was one of the main design features of the flooring requirements. Long-term durability and easy to maintain was the reason for selecting polished concrete.

Lythic polished concrete products offer a complete flooring solution with unique colloidal silica technology. The 100% reactive silica ensures the concrete is chemically hardened prior to the mechanical polishing process that takes place.

More store to be polished with Lythic technology.



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Project: Dental facility
Profile: Lythic Polished Concrete Products
Materials: Lythic Densifier
Lythic SPD Protector
Lythic Cleaner

Location: USA

Overview: The outline for this project was hygiene. The floor needed to be easy to clean and stain resistant when chemicals are spilt. Lythic SPD Protector offers premium stain protection without looking like a coating has been applied. SPD Protector is a silica polymer dispersion that chemically bonds to polished concrete. The floor was only polished to approximately a 400 grit resin bond before SPD Protector was applied.

When dry the floor was high speed burnished using a 3000 grit burnishing pad. This creates a high gloss finish and produces a stain resistant barrier.

The floor is cleaned daily with Lythic Cleaner which continually adds silica to the floor, increasing shine and protection.





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Project: Dunelm Mills Corporate Office
Profile: Lythic Polished Concrete Products
Materials: Lythic Densifier
Lythic Protector
Lythic Cleaner

Location: Great Britain

Overview: Dunelm Mills is a homeware retailer across the UK with over 100 stores. The new head office facility was inspired by sustainable construction methods. Polished concrete was one of three flooring finishes presented to the client. After a lifecycle cost analysis was broken down, polished concrete was the clients preferred choice.

The floor was cut back to reveal small to medium size aggregate. Then Lythic Densifier was used to harden the concrete before the final polishing stages. Lythic Protector was the applied to help resist stains and increase traction when wet. The Lythic Cleaner is used daily to maintain the shine and keep the surface to the clients satisfaction.



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Project: Noodle Bar Fast Food Outlet #1
Profile: Lythic Polished Concrete Products
Materials: Lythic Densifier
Lythic Protector
Lythic Cleaner

Location: China

Overview: The design team for the Noodle Bar required function, durability, low maintenance in addition to creating a floor that did not look too industrial. They wanted people to feel comfortable during the eating experience.

The floor was highly polished using Lythic Densifier. Afterwards a template was placed over the entire floor allowing the design to be sand-blasted with a light etch. When the template was removed the floor was cleaned and sealed with Lythic Protector. General cleaning is completed daily with Lythic Protector and a high speed burnish.





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Project: Starbucks #2
Profile: Lythic Polished Concrete Products
Materials: Lythic XL Densifier
Lythic Protector
Lythic Cleaner

Location: China

Overview: Mechanically exposed polished concrete is part of the new look for Starbucks locations in China. The design team find the floors attractive and easy to live with.

Lythic polished concrete products are available in concentrated formulas which makes them cost efficient to be shipped anywhere in the World. The pure 100% reactive colloidal silica offers a more sustainable solution compared to traditional densifier such as sodium, lithium or potassium silicates.

For more information regarding colloidal silica versus silicates visit:
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www.lythic.com



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