



# Densifier XL

## Technical Information Sheet

Rev: TIS-LY-DEN-XL-2013-05

*Colloidal Silica is at the heart of Lythic technology.*

It is a substance that reacts with the chemistry of concrete to produce more cementitious material, which translates into higher performance concrete.

\*Issued May, 2013. Subject to change. Contact Solomon/Brickform for most up-to-date information

**SPECIFICATION: Section 03 35 00 Concrete Finishing**

<b>001: PRODUCT DESCRIPTION</b> .....	p1
<b>002: FEATURES &amp; ADVANTAGES</b> .....	p1
<b>003: SUSTAINABILITY</b> .....	p2
<b>004: MATERIALS PACKAGING</b> .....	p2
<b>005: COVERAGE RATES</b> .....	p2
<b>006: SAFETY PRECAUTIONS</b> .....	p2
<b>007: MIXING &amp; DILUTION</b> .....	p2
<b>008: EQUIPMENT</b> .....	p2
<b>009: PRE-APPLICATION</b> .....	p2
<b>010: PROJECT TESTING</b> .....	p3
<b>011: APPLICATION GUIDELINES</b> .....	p3
<b>012: NEXT STEPS</b> .....	p3
<b>013: LIMITATIONS &amp; IMPORTANT NOTES</b> .....	p3
<b>014: LYTHIC DENSIFIER XL USED IN CONJUNCTION WITH</b> .....	p4
<b>015: PHYSICAL PROPERTIES</b> .....	p4
<b>016: STORAGE &amp; SHELF LIFE</b> .....	p4
<b>017: WARRANTY</b> .....	p4
<b>018: FIRST AID</b> .....	p4

**001: PRODUCT DESCRIPTION**

**Lythic Densifier XL** with reactive colloidal silica is a densifier/hardener for concrete, used to improve the performance and appearance of concrete floors. **Lythic Densifier XL** is designed specifically for treating extremely porous or deteriorated concrete. It increases surface hardness, compressive strength, abrasion-resistance, and liquid penetration-resistance. It can be used in the concrete polishing process to yield a glossy, reflective appearance similar to terrazzo or polished natural stone, even on softer slabs that do not respond properly to conventional densifiers. **Lythic Densifier XL** reduces dusting, efflorescence and ASR. It is a zero-VOC, non-toxic, safe-to-handle liquid that does not require scrubbing in, removal, or hazardous residue disposal, and does not leave discoloring mineral salt deposits on concrete.

**Lythic Densifier XL** is 99.5% pure silica in nano-scale particles, suspended in an ultra-low surface-tension liquid using a proprietary, "green" manufacturing process. **Lythic Densifier XL** features substantially larger silica particle-size than standard **Lythic Densifier**, although the particles are still nano-scale. It reacts with calcium hydroxide (*aka lime*) in the concrete matrix to create additional calcium silicate hydrates (*CSH*), the active binder in cement paste, which becomes a permanent part of

the concrete. This new CSH increases the density of the concrete surface. Colloidal silica is unique among densifiers in that it also bonds to silica in concrete, and bonds to itself, enabling it to build up density in a way that silicate densifiers cannot.

**Lythic Densifier XL** may be helpful in restoring slabs that have suffered certain types of chemical deterioration sometimes referred to as bi-carbonation or cold-weather carbonation.

**Lythic Densifier XL** is used in concrete polishing to harden the surface and to close the pore structure, enabling the concrete to take a better polish and help resist liquid penetration. **Lythic Densifier XL's** unique ability to build up surface density creates more polishable material. It increases durability of polished concrete surfaces, enhances reflectivity and extends the overall lifecycle of the finished floor. It is compatible with integral color, dyes, and shake-on hardeners, and will protect color appearance by reducing efflorescence. It can be applied on any concrete surface to achieve a more durable finish that resists spills and wear-damage.

**Lythic Densifier XL** is a zero-VOC, environmentally responsible product that may help qualify for LEED credits for Indoor Environmental Quality (*EQ Credit 4.2: Low-Emitting Materials*).

**002: FEATURES & ADVANTAGES**

**Lythic Densifier XL** can be applied to any new or cured concrete surface to increase hardness and abrasion resistance, and prevent dusting.

**Lythic Densifier XL's** larger particle size can optimize performance on porous or deteriorated concrete. **Lythic Densifier XL** can be used in conjunction with **Lythic Densifier** and other Lythic products as described in Section 014.

**Lythic Densifier XL** works well with colored concrete. It minimizes efflorescence that can dull color. Unlike some silicate densifiers that can contribute to alkali-silica reaction (*ASR*), **Lythic Densifier XL** reduces the risk of ASR.

Because it bonds to silica in cementitious materials, **Lythic Densifier XL** can work with low-lime decorative cementitious overlays that do not react well with sodium, lithium, or potassium silicate densifiers, although porosity is usually not a problem with these overlays.

Unlike silicate densifiers, **Lythic Densifier XL** contains no significant proportion of mineral salts that can discolor concrete. It is fast-reacting, and does not require scrubbing-in or extensive reacting time. There is nothing to scrub off and no hazardous waste disposal.

**Lythic Densifier XL** provides multiple advantages and benefits:  
 ◇ Hardens surface

- ◊ Enables concrete to take a polish
- ◊ Bonds to silica in concrete and to itself for density build-up
- ◊ Makes surface less permeable, increases resistance to liquid penetration, staining
- ◊ Increases surface compressive strength
- ◊ Increases impact resistance
- ◊ Increases abrasion resistance
- ◊ Prevents dusting
- ◊ Slows surface damage and extends service life of older slabs
- ◊ Works with low-lime decorative cementitious overlays
- ◊ Does not yellow or whiten concrete.
- ◊ Safe to handle – lower pH than silicates
- ◊ Fast reacting – one hour or less
- ◊ No overnight curing
- ◊ No scrubbing-in
- ◊ No residue removal
- ◊ No hazardous waste disposal
- ◊ Water-based

**003: SUSTAINABILITY**

Exposed concrete, such as a polished concrete floor, is an inherently sustainable flooring solution that is durable, and offers a very long service life with only simple maintenance. It lowers materials and energy-consumption by eliminating the need for frequently-replaced floor covering materials. In many situations, the concrete itself is already installed, further reducing materials-consumption. Exposed concrete floors require minimal, low-impact maintenance, thereby lowering maintenance energy-consumption and eliminating harsh chemicals and solvents used to strip and wax some floor coverings.

**Lythic Densifier XL** has specific sustainability benefits:

- ◊ Zero-VOC formula
- ◊ Concentrate to lower environmental impacts, shipping and storage costs. (*Reduced Carbon Footprint*)
- ◊ No hazardous waste

**004: MATERIALS PACKAGING**

**Lythic Densifier XL** is packaged as a concentrate, minimizing shipping and handling expense.

Packaging Detail:

- ◊ 1 gallon / 3.78 liter container ..... concentrate
- ◊ 5 gallon / 18.92 liter bucket ..... concentrate

**Lythic Densifier XL** concentrate is intended to be diluted with water before use. *\*(See section 007: Mixing & Dilution)*

**005: COVERAGE RATES**

**Lythic Densifier XL** will yield different coverage results depending on the porosity of the floor. Test on a small sample area to determine appropriate application rate and technique before applying to entire project area. *\*(See section 010: Project Testing)*

Use these coverage rates as a starting point to determine necessary application rate:

- ◊ High Porosity Concrete ..... 250 - 400 sf/gal (6.1 – 9.8 m<sup>2</sup>/L)
- ◊ Medium Density Concrete .. 300 - 500 sf/gal (7.4 – 12.3 m<sup>2</sup>/L)
- ◊ Hard Concrete ..... 400 - 600 sf/gal (9.8 – 14.7 m<sup>2</sup>/L)
- ◊ High Density Concrete ..... 500 - 700 sf/gal (12.3 – 17.2 m<sup>2</sup>/L)

The coverage rates are based on a mixed ready-to-use (RTU) gallon of **Lythic Densifier XL**. *\*(See section 007: Mixing & Dilution)*

*\*Important: (See the coverage chart on page 4)*

**006: SAFETY PRECAUTIONS**

WARNING: FOR PROFESSIONAL USE ONLY. BEFORE USING PRODUCT, READ MATERIAL SAFETY DATA SHEET (MSDS) AND INSTRUCTIONS ON PACKAGING. ALKALINE CONCENTRATE: CONTACT CAN DAMAGE EYES, SKIN AND OTHER BODY TISSUES. HANDLE WITH CARE. EYE AND SKIN IRRITANT. DIGESTIVE TRACT IRRITANT; DO NOT TAKE INTERNALLY. KEEP OUT OF REACH OF CHILDREN. SPRAY MIST IS RESPIRATORY TRACT IRRITANT. USE ONLY WITH ADEQUATE VENTILATION. Do not breathe vapors or spray mist. Avoid contact with eyes, skin, clothing. Observe appropriate safety and jobsite controls. Wear appropriate protection including eye protection and chemical-resistant gloves. Ensure fresh air-flow during application and until dry. If you experience headaches, dizziness, eye watering, or if air monitoring shows vapor/mist levels above applicable limits, wear a properly fitted P100/organic vapor respirator (NIOSH TC-84A approved), used according to manufacturer's directions, during application and drying. SLIP/FALL DANGER: During application of **Lythic Densifier XL** and until dry, treated surface will be slippery. Use extreme care when walking on wet **Lythic Densifier XL**.

**007: MIXING & DILUTION**

**Lythic Densifier XL** is shipped as a concentrate. Before use, it must be diluted with clean potable water in a ratio of 1:1.

- 1 - Before opening **Lythic Densifier XL** container, shake to agitate the concentrate.
- 2 - Pour one part **Lythic Densifier XL** concentrate into mixing container or directly into sprayer.
- 3 - Add one part clean potable water to make **Lythic Densifier XL** Ready-to-Use (RTU) mixture.
- 4 - Mix for 30 seconds using low-to-medium speed drill and mixing paddle, or shake sprayer for 60 seconds, until mixture is homogeneous and uniform.

the immediate work at hand, and only making as much **Lythic Densifier XL** RTU mixture as needed. Left over RTU mixture can be stored in an air-tight container, and needs to be used within 2 months after being mixed from concentrate, or the stated expiration date, whichever comes first. Manufacturing date can be found within the batch number on the original packaging. Over prolonged periods of time, RTU mixture may settle. Before using RTU mixture, agitate container to mix contents.

*\*Important: The water used to dilute **Lythic Densifier XL** concentrate must be clean potable water. Any contaminants in the water could reduce the shelf life of RTU mixture.*

#### 008: EQUIPMENT

Apply using a low-pressure pump sprayer. Automatic low-pressure sprayers can also be used for larger projects.

#### 009: PRE-APPLICATION

Advanced planning is critical to all successful concrete work, including the use of **Lythic Densifier XL**.

- ◇ Any adjacent areas, surfaces, or objects not intended to be treated with **Lythic Densifier XL** should be protected from overspray or drift with plastic sheeting or other proven protective material.
- ◇ Surface must be clean and structurally sound, and must be clear of membrane forming curing compounds, oils, dust and other surface contaminants that will prevent **Lythic Densifier XL** from having full contact with the concrete. Do not use acidic or aggressive detergents when cleaning before or after application of **Lythic Densifier XL**. Use **Lythic Cleaner** or other pH neutral cleanser.
- ◇ Measure area (*square feet/m<sup>2</sup>*) that will require **Lythic Densifier XL**.
- ◇ Mix an appropriate quantity of **Lythic Densifier XL** for job-size, per instructions in Section 007: Mixing & Dilution, using estimated coverage rates in Section 005: Coverage Rates or the coverage chart on page 4.
- ◇ Check that sprayers and tips are in working order.
- ◇ Designate trained operator(s) to apply **Lythic Densifier XL** throughout project, to ensure consistent application.

#### 010: PROJECT TESTING

To assure that performance and slip-resistance specifications are met, and that desired appearance is achieved, test a sample area of each slab to be treated, using the proposed treatment methods and techniques, coverage rates, and equipment, with the work performed by the same installation personnel who will do the project. Test section should be large enough to properly represent the overall slab. Specific to **Lythic Densifier XL**, check whether coverage rate is appropriate, that concrete accepts the product, and that product is reacting with slab.

*NOTE:* Grinding and polishing operations may significantly alter slip-resistance of surface. To determine that safe levels of wet and dry slip-resistance are achieved, it is necessary to apply the complete treatment, including the protection layer. **Lythic Protector** and **Lythic Protector SPD** increase slip resistance.

#### 011: APPLICATION GUIDELINES

**Lythic Densifier XL** can be applied to new or existing concrete. Application may vary depending on the type of project and other jobsite specifics. The information provided is best practice guidelines for **Lythic Densifier XL**. Every project will present variables that may require adjustment of application procedures during the job. These guidelines are based on terminology used within the concrete and flooring industry sector.

*\*(See coverage chart on page 4)*

#### 011-A - GENERAL APPLICATION INSTRUCTIONS

- 1 - Agitate **Lythic Densifier XL** RTU mixture before pouring into sprayer.
- 2 - Pour **Lythic Densifier XL** RTU mixture into sprayer. Keep sprayer pressure at optimized level, allowing even distribution when applying to concrete surface.
- 3 - Spray apply **Lythic Densifier XL**, holding spray tip 12-24 inches above surface and moving in a circular motion to achieve even distribution. Spray enough to form an even sheen and ensure complete saturation of surface.
- 4 - Apply **Lythic Densifier XL** until the surface is at the point of saturation.
- 5 - Keep the surface wet for 10 to 15 minutes, applying additional **Lythic Densifier XL** only as needed. Areas of higher porosity will require more **Lythic Densifier XL**.
- 6 - Allow surface to dry completely before further operations commence.

#### 011-B - DIAMOND GRINDING / POLISHING

As part of concrete polishing, **Lythic Densifier XL** is typically applied after the initial diamond cutting stages or surface stock removal is completed, and prior to the higher levels of diamond polishing. In most instances, it is used after to 200-grit to 400-grit steps. See coverage chart for application stages on page 4.

#### 012: NEXT STEPS

Polishing or other treatments can begin when **Lythic Densifier XL** has dried. Concrete intended to be left exposed should be protected with **Lythic Protector**, **Lythic SPD Protector** or other appropriate to the finish installed, as the final step of treatment. Exposed concrete should be cleaned with **Lythic Cleaner** or other pH neutral cleaners. Avoid acidic cleaners and detergents containing hydroxides or sulfates as these may etch or dull the surface.

**013: LIMITATIONS & IMPORTANT NOTES**

- ◇ **Lythic Densifier XL** densifies and hardens concrete surfaces, but should not be confused with concrete sealers; it will not seal or prevent staining.
- ◇ Floors treated with **Lythic Densifier XL** should not be cleaned with citric or abrasive cleaning fluids. Medium to long-term exposure to aggressive cleaning products will cause damage. **Lythic Cleaner** or other pH neutral cleansers or should be used for continuous maintenance of concrete that has been treated with **Lythic Densifier XL**.
- ◇ During application of **Lythic Densifier XL** and until dry, treated surface will be slippery. Use extreme care when walking on wet **Lythic Densifier XL**.
- ◇ Jobsite samples are strongly recommended prior to application of all Solomon/Brickform and Lythic products.

**014: LYTHIC DENSIFIER XL USED IN CONJUNCTION WITH:**

- ◇ **Lythic DAY1** .....(Troweling aid and curing agent)
- ◇ **Lythic Densifier** .....(Smaller particle densifier)
- ◇ **Lythic Protector** .....(Color enhancer & stain reducer)
- ◇ **Lythic SPD Protector** .....(Color enhancer & stain protection)
- ◇ **Lythic Cleaner** .....(Colloidal silica cleaning agent)
- ◇ **CONTRAZZO** .....(Polished concrete overlay system)
- ◇ **Pro-Dye** .....(Penetrating colorant concentrate)

*\*Other Solomon/Brickform products can be used in conjunction with **Lythic Densifier XL***

**015: PHYSICAL PROPERTIES**

- Appearance ..... milky white liquid
- Drying Time ..... 20 min to 1 hour
- VOC Content ..... 0 g/l (VOC-free)
- Active Ingredients ..... 100% of total solid
- pH ..... approx 9.5
- Freeze point ..... 32°F / 0°C
- Shelf Life ..... 24 months

**016: STORAGE & SHELF LIFE**

**Lythic Densifier XL** should be kept in the original container when

possible, with the lid fastened tightly. **Lythic Densifier XL** concentrate has an optimized shelf life of 24 months from the date of manufacture. This date is available on the batch reference number on the original container.

Storage of RTU mixture: see Section 006: Mixing & Dilution

Keep in a cool, dry place raised off the floor. Keep in temperature range of 40–100°F or 4–38°C.

**\*Important: Do Not Allow to Freeze**

**017: WARRANTY**

**Lythic Densifier XL** is intended for use by licensed contractors and installers, experienced and trained in the use of these types of products. It is warranted to be of uniform quality, within manufacturing tolerances. The manufacturer has no control over the use of this product, therefore, no warranty, expressed or implied, is or can be made either as to the effects or results of such use. In any case, the manufacturer’s obligations shall be limited to refunding the purchase price or replacing **Lythic Densifier XL** proven defective. The end user shall be responsible for determining product’s suitability and assumes all risks and liability.

**018: FIRST AID**

**Ingestion:** Not expected to be toxic. Never give an unconscious person anything to ingest. If swallowed, immediately give two glasses of water, **DO NOT INDUCE VOMITING**. Seek medical attention if ill effects develop.

**Inhalation:** May cause irritation. Remove to fresh air and provide oxygen. If not breathing, give artificial respiration. Seek medical attention if irritation persists.

**Eye Contact:** Flush with plenty of water for at least 15 minutes. Seek medical attention if irritation persists.

**Skin Contact:** May cause irritation. Wash affected area with soap and water. Remove contaminated clothing and shoes. Seek medical attention if irritation persists.

In most cases, medium-to-high density and polished concrete should be treated with standard **Lythic Densifier**. **Lythic Densifier XL** performs most efficiently on porous and damaged concrete. In circumstances where you wish to apply **Lythic Densifier XL** to harder slabs, use these rates as a starting point:

Concrete Condition	Diamond Stage/Stages			Possible Applications	Coverage Per Application
Ultra Soft Condition Concrete	50-80 Grit	80-100 Grit	100-200 Grit	3 Coat Application	250 - 400 ft per Gallon
Soft Condition Concrete	80-100 Grit		120-200 Grit	2 Coat application	250 - 400 ft per Gallon
Normal Condition Concrete	80-200 Grit			1 Application	300 - 500 ft per Gallon
Hard Condition Concrete	80-200 Grit			1 Application	400 - 600 ft per Gallon
High Density Concrete	100-400 Grit			1 Application	500 - 700 ft per Gallon