



# Densifier

## Technical Data Sheet

CODE: Xtreme Hard

**Colloidal Silica** is at the heart of concrete technology. It is a substance that reacts with the chemistry of concrete to produce more cementitious material, which translates into higher performance concrete.

\*Updated May 2018. Subject to change. Contact XtremeHardDensifier.com.

**SPECIFICATIONS** | Concrete Polishing

### PRODUCT DESCRIPTION

Xtreme Hard Densifier with reactive colloidal silica is a densifier/hardener for concrete, used to improve the performance and appearance of concrete floors. It increases surface hardness, compressive strength, abrasion resistance, and liquid penetration-resistance. It is an integral part of the concrete polishing process, which can yield a glossy, reflective appearance similar to terrazzo or polished natural stone. Xtreme Hard densifier 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.

Xtreme Hard Densifier is 99.5% pure silica in nano-scale particles, suspended in an ultra-low surface-tension liquid using a proprietary, "green" manufacturing process. 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.

Xtreme Hard Densifier is used for 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. Xtreme Hard Densifiers polish and help resist liquid penetration. Xtreme Hard Densifiers unique ability to build up a 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.

Xtreme Hard Densifier 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).

### FEATURES & ADVANTAGES

Xtreme Hard Densifier can be applied to any new or cured concrete surfaces to increase hardness and abrasion resistance, and prevent dusting.

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

Because it bonds to silica in cementitious materials, Xtreme Hard Densifier works with low-lime decorative cementitious overlays that do not react well with sodium, lithium, or potassium silicate densifiers.

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

Xtreme Hard Densifier 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

### 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 material 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 floor coverings.

Xtreme Hard Densifier has specific sustainability benefits:

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



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## MATERIALS PACKAGING

Xtreme Hard Densifier 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

Xtreme Hard Densifier concentrate is intended to dilute with water before use. \*(See section: Mixing & Dilution)

## COVERAGE RATES

Xtreme Hard Densifier 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: 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 m2/L)
- Medium Density Concrete ..... 300 – 500 sf/gal (7.4 – 12.3 m2/L)
- Hard Concrete ..... 400 – 600 sf/gal (9.8 – 14.7 m2/L)
- High Density Concrete ..... 500 – 700 sf/gal (12.3 – 17.2 m2/L)

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

## 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 breath vapors or spray mist. Avoid contact with eyes, skin, and clothing. Observe appropriate safety and jobsite controls. Wear appropriate protection including eye protection and chemical-resistant gloves. Ensure fresh airflow 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 manufacturers directions, during application and drying. SLIP/FALL DANGER: During application of Xtreme Hard Densifier and until dry, treated surface will be slippery.

Use extreme care when walking on wet Xtreme Hard Densifier:

## MIXING & DILUTION

Xtreme Hard Densifier is shipped as a concentrate. Before use, it must be diluted with clean potable water in a ratio of 4:1.

1. Before opening Xtreme Hard Densifier container; shake to agitate the concentrate.
2. Pour one part Xtreme Hard Densifier concentrate into mixing container or directly into sprayer.
3. Add **four parts** clean potable water to make Xtreme Hard Densifier 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.

We recommend calculating the quantity of material needed for the immediate work at hand, and only making as much Xtreme Hard Densifier RTU mixture as needed. Left over RTU mixture can be stored in an airtight container; and needs to be used within 2 months after being mixed from concentrate, or the stated expiration date, which 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 Xtreme Hard Densifier concentrate must be clean potable water. Any contaminates in the water could reduce the shelf life of RTU mixture.

## EQUIPMENT

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

## PRE-APPLICATION

Advanced planning is critical to all successful concrete work, including the use of Xtreme Hard Densifier:

Any adjacent areas, surfaces, or objects not intended to be treated with Xtreme Hard Densifier 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 that form curing compounds, oils, dust and other surface contaminants that will prevent Xtreme Hard Densifier from having full contact with the concrete. Do not use acidic or aggressive detergents when cleaning before or after application of Xtreme Hard



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Densifier: Use Xtreme Hard Cleaner or other pH neutral cleaner.

Measure area (square feet/m<sup>2</sup>) that will require Xtreme Hard Densifier:

Mix an appropriate quantity of Xtreme Hard Densifier for job-size, per instructions in Section: Mixing & Dilution, using estimated coverage rates in Section: Coverage Rates or the coverage chart on page 4.

Check that sprayers and tips are in working order.

Designate trained operator(s) to apply Xtreme Hard Densifier throughout project, to ensure consistent application.

### PROJECT TESTING

To assure that performance and slip-resistant 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 Xtreme Hard Densifier, 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 are achieved, it is necessary to apply the complete treatment, including the protection layer: Xtreme Hard Protector and Xtreme Hard Protector SPD increase slip resistance.

### APPLICATION GUIDELINES

Xtreme Hard Densifier 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 Xtreme Hard Densifier. 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:

#### General Application Instructions

1. Agitate Xtreme Hard Densifier RTU mixture before pouring into sprayer.
2. Pour Xtreme Hard Densifier RTU mixture into sprayer. Keep sprayer pressure at optimized level, allowing even distribution when applying to concrete surface.
3. Spray apply Xtreme Hard Densifier, 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 Xtreme Hard Densifier until the surface is at the point of saturation.

5. Keep the surface wet for 10 to 15 minutes, applying additional Xtreme Hard Densifier only as needed. Areas of higher porosity will require more Xtreme Hard Densifier.

6. Allow surface to dry completely before further operations commence.

#### Diamond Grinding / Polishing

As part of concrete polishing, Xtreme Hard Densifier 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 200-grit to 400-grit steps. See coverage chart for application stages on page 4.

#### New (Green) Concrete

Xtreme Hard Densifier can be applied within 1 to 3 days after the concrete placement, when the peak of hydration and outgassing has slowed enough to allow sufficient penetration. Application at this stage dramatically increases abrasion resistance, will help to prevent dusting and ASR, and will improve overall surface performance. Slab must be clean and free of all contaminants such as curing compounds, bond breakers, release oils, dust and debris, etc. Apply per instructions in 011-A General Application Instructions steps 1-4. Allow to dry. No cleaning, flooding, neutralizing, or rinsing is necessary.

### NEXT STEPS

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

### LIMITATIONS & IMPORTANT NOTES

Xtreme Hard Densifier densifies and hardens concrete surfaces, but should not be confused with concrete sealers; it will not seal or prevent staining.

Floors treated with Xtreme Hard Densifier should not be cleaned



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with citric or abrasive cleaning fluids. Medium to long-term exposure to aggressive cleaning products will cause damage. Xtreme Hard Cleaner or other pH neutral cleaners should be used for continuous maintenance of concrete that has been treated with Xtreme Hard Densifier.

During application of Xtreme Hard Densifier and until dry, treated surface will be slippery. Use extreme care when walking on wet Xtreme Hard Densifier.

Jobsite samples are strongly recommended prior to application of all Xtreme Hard products.

### XTREME HARD DENSIFIER USED WITH

- Xtreme Hard Protector ..... (Color enhancer & stain reducer)
- Xtreme Hard Cleaner ..... (Colloidal silica cleaning agent)
- Xtreme Colors ..... (Penetrating colorant concentrate)

### PHYSICAL PROPERTIES

- Appearance ..... milky white liquid
- Drying Time ..... 20 minutes to 1 hour
- VOC Content ..... 0 g/l (VOC-free)
- Active Ingredients ..... 100% of total solid
- pH ..... Approx. 9.5
- Freeze point ..... 32 degrees F / 0 degrees C
- Shelf Life ..... 5 years

### STORAGE & SHELF LIFE

Xtreme Hard Densifier should be kept in the original container when possible, with the lid fastened tightly. Xtreme Hard Densifier concentrate has an optimized shelf life of 5 years from the date of manufacture. This date is available on the batch reference number on the original container.

Storage of RTU mixture: see Section: Mixing & Dilution

Keep in a cool, dry place raised off the floor. Keep in temperature range of 40-38 C

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

### 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 VOMITTING. Seek medical attention if it effects develop.**

**Inhalation:** May cause irritation. Remove to fresh air and provided 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 medial attention if irritation persists.

The chart offers generalized guidelines of application rates and recommended diamond-grit stages for application of Xtreme Hard Densifier, according to the condition of the slab. High porosity or heavily damages concrete could require multiple applications of Xtreme Hard Densifier.

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| 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  |