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DENSIFIERS & SEALERS

PENTRA-SIL 244+

SALT PROTECTION & DUST PROOFER - HARDENER, SEALER, DENSIFIER

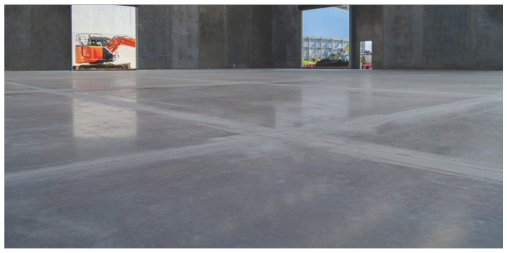
PENTRA-SIL 244+ is a clear, odourless V.O.C. compliant, water-based, environmentally safe to use salt protectant and dust proofer that hardens, seals, and densifies concrete and masonry surfaces. Pentra-Sil 244+ reacts chemically with siliceous materials to provide a permanent hydrophobic surface that protects and preserves concrete surfaces and a variety of masonry substrates without altering the natural appearance and texture.

USES

- Park Garages
- Stadiums
- Buildings
- Marinas
- Sea Walls
- Dams
- Bulkheads
- Loading Docks
- Foundations
- Bridge Decks
- Highway Sound Barriers
- Brick
- Stone Veneers
- Cast-in-place Concrete
- Precast
- Overpass Tunnels
- Pedestrian Walkways
- Driveways
- Pavement
- Monuments

SALT & MOISTURE EXPOSED AREAS

- Adobe
- Granite
- Natural Stone
- Sandstone
- Clay Brick
- Mortars
- Limestone
- Terracotta
- Architectural Concrete
- Cast-in-place Concrete
- Concrete Masonry Units
- Exposed Aggregate Substrates
- Portland Cement Stuccos
- Precast Prestressed Concrete Products
- Stamped/Coloured Concrete
- Acid Stained Concrete
- Terazzo



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PRODUCT DESCRIPTION

Pentra-Sil (244+)™ Salt Protection & Dust Proofer - Hardener, Sealer, Densifier is a clear, odourless V.O.C. compliant, water-based, environmentally safe to use salt protectant and dust proofer that hardens, seals, and densifies concrete and masonry surfaces. Pentra-Sil 244+ reacts chemically with siliceous materials to provide a permanent hydrophobic surface that protects and preserves concrete surfaces and a variety of masonry substrates without altering the natural appearance and texture.

Pentra-Sil 244+ is in a class of its own. It provides all the protection of a high-end penetrating water repellent sealer and offers all the benefits of a surface hardener, sealer, densifier.

Pentra-Sil 244+ Salt Protectant, Hardener, and Sealer is a patented surface treatment that both penetrates and seals by reacting chemically with the concrete surface, forming a clear, dense, and durable inorganic topical surface layer that is breathable, abrasion-resistant, and hydrophobic.

Pentra-Sil 244+ forms an effective chloride ion screen providing superior protection against water and water-carried salts that cause erosion, deterioration and corrosion. Pentra-Sil seals micro-channels making concrete harder, stronger, more abrasion resistant, dustproof, and easier to maintain. Substrates become resistant to staining, spalling, weathering, efflorescence, water intrusion, fungi and mildew, deterioration, freeze-thaw scaling and reinforcing steel corrosion. Pentra-Sil 244+ will also harden the surface and is extremely abrasion resistant, providing the ability to maintain a salt ion screen and water repellent characteristics even through regular maintenance, pressure washing, pedestrian and traffic wear. The permanent bond lasts longer than silanes, reduces maintenance costs, and looks better over time.

Pentra-Sil 244+ can be used as an interior or exterior treatment for both horizontal and vertical concrete and masonry. It is perfect for parking garages, bridge decks, exterior concrete, integrally coloured concrete and acid stained concrete.

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DENSIFIERS & SEALERS

PENTRA-SIL 244+

KEY FEATURES & BENEFITS

- Provides Maximum water repellency combined with hardening, densifying and sealing characteristics to provide longterm protection against staining and deterioration
- Chloride-Ion Protection: Pentra-Sil 244+ meets industry standards (NCHRP 244) for protecting concrete against chloride intrusion. (90%+ effectiveness)
- Sealing: As Pentra-Sil 244+ penetrates the micro-channels in concrete, it reacts to form insoluble silicate structures that seal the concrete. This helps protect the concrete from water penetration and makes it more resistant to many types of chemicals.
- Hardening and Dust Proofing: Pentra-Sil 244+ hardens the concrete making it stronger and more abrasion resistant. It also dust proofs the concrete, so particles of concrete will not circulate within a building creating a health and maintenance problem.
- Environmentally Safe: Pentra-Sil 244+ contains no carcinogens and minimal VOC's. The application is fast and the floor is ready to use within hours.
- Economical: Pentra-Sil 244+ incorporates the hardening of a densifier with the chloride protection of a silane, all in a single, permanent application. Epoxies, urethanes, and acrylics all need to be regularly stripped and re-applied.
- ASR Protection: Alkali-Silica Reaction (ASR) is a worldwide problem that occurs when the alkali in the large and fine aggregates reacts with the silica in the cement and with water to form an expansive gel, which can break concrete apart. Other chemical hardeners use potassium or sodium compounds, which can raise alkalinity and contribute to ASR. Pentra-Sil 244+ uses exclusive lithium technology that does not contribute to the alkalinity and can even help prevent surface ASR.
- Surfaces treated with Pentra-Sil will maintain their natural appearance, vapor permeability, slip resistance and other surface characteristics.
- Seals micro-channels in concrete against water and chemical attack that cause corrosion and deterioration.
- Helps reduce damaging ASR alkali-silica reactions in the surface layer of concrete substrates.
- Testing demonstrates that Pentra-Sil provides unsurpassed water repellency from salt and water intrusion.
- Creates a stronger, more impenetrable, and better-looking finish that is dust-proof and resistant to staining and deterioration.
- Penetrates deep inside the concrete capillaries (3-5 mm in densely finished concrete) chemically reacting with the free-lime, forming a permanent insoluble bond within the concrete.
- Forms a protective surface layer that is breathable, dense and abrasion resistant.
- Protection from acid rain, waterborne chemicals and freeze-thaw damage.
- Protects coloured concrete from weathering and efflorescence.
- Reduces maintenance, cleaning costs and repairs.

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DENSIFIERS & SEALERS

PENTRA-SIL 244+

OTHER USES

Top protective surface guard for polished floors that provides superior stain resistance, chemical resistance, water repellency and enhanced surface sheen. When polished, surfaces treated with Pentra-Sil 244+ become brilliantly glossy, and durable, extending the life of concrete floors.

Used as a protective surface treatment, Pentra-Sil 244+ provides maximum performance on floors that have already been treated with Pentra-Sil Nano Lithium (NL) Concrete Hardener, Sealer, and Densifier.

Excellent colour enhancer and sealer for acid stained or integrally coloured concrete, pavers, block and roof tiles.

UNIQUE CHEMISTRY See Table 1.

(For visual descriptions of magnified views.)

Pentra-Sil 244+ formulation is a colourless Nano Lithium silicate that is crosslinked with a proprietary silane technology that allows it to chemically react with siliceous materials and free-lime, forming extremely strong tri-calcium silicate compounds. Its unique penetrating chemistry forms an insoluble, permanent bond creating a hydrophobic, abrasion and chemically resistant surface for architectural concrete and masonry substrates.

Pentra-Sil's 244+ technology's unique atomic structure (Particle Size) and lower viscosity to conventional treatments provide superior penetration within the capillary channels providing a more consistent and uniform cure. The Advanced Nano Lithium (NL) will not absorb water or affect alkalinity and is suitable for both interior and exterior applications on new or existing concrete.

Because both the Nano Lithium and the Silane molecules are very small, Pentra-Sil 244+ is able to penetrate deeply into the concrete pores where it forms a barrier against water and water-borne salts that can cause reinforcing steel corrosion. It also helps substantially reduce efflorescence by preventing the large salt particulates from leaching and migrating to the surface with wet/dry cycles. By further reducing moisture permeation and water in the wall system, there is less likelihood of soluble salts in the concrete of being dissolved and brought to the surface. Reducing the moisture penetration also lessens the possibility of fungi and mildew in or on the wall or floor.

TABLE.1

Maginification x200
Untreated

Maginification x200
Treated

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DENSIFIERS & SEALERS

PENTRA-SIL 244+

UNIQUE CHEMISTRY

The Most Significant Advance in Chemical Concrete Sealer and Hardening Technology in Fifty Years. Pentra-Sil™ Nano Lithium (NL)™ is a patented Lithium Silicate compound that cures at room-temperature into an inorganic, clear, glass-like compound that is insoluble and extremely hard. The technology is unsurpassed by alternative technologies and is the superior surface treatment for concrete floors.

Pentra-Sil penetrates deeper than sodium or potassium- based sealers, but more importantly, Pentra-Sil penetrates more evenly throughout the surface matrix of the concrete, with substantially better particle distribution during absorption. See Table 2a.

By nature, sodium and potassium react violently in concrete. These rapid reactions create uneven clumps of untreated calcium throughout the surface layer. These clumps form weak, erratic bonds that can allow water to enter the substrate over time contributing to reduced life cycle from potential surface wear and tear, dusting, staining, chemical deterioration or environmental erosion. Furthermore, the sodium and potassium bonds are soluble, and actually, attract moisture and expand, which can lead to surface crazing (among other causes). See Table 2b.

The Nano-Lithium chemistry engineered into Pentra-Sil buffers these reactions, allowing the Nano Lithium to react more entirely with the calcium compounds -creating denser, harder bonds and leaving far fewer untreated calcium molecules protecting against mechanical wear and chemical attack. The Nano Lithium bond is insoluble, so it will not attract and absorb moisture, leaving the surface more stable and less likely to craze. See Table 2c.

TABLE.2a

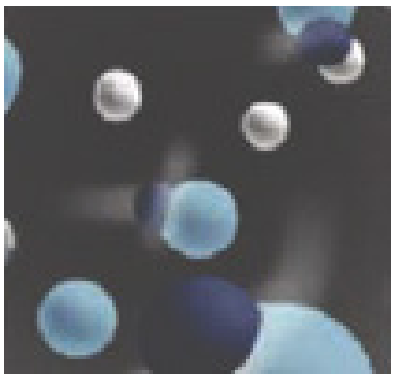


TABLE.2b

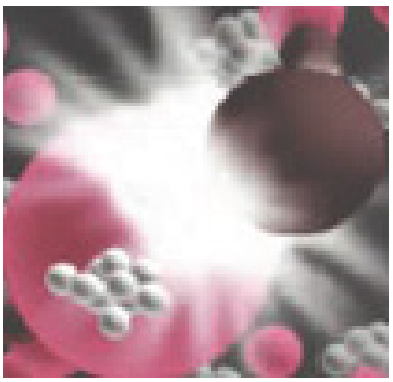
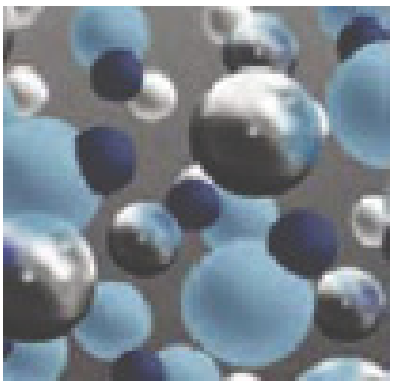


TABLE.2c



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CHEMICAL RESISTANCE

Pentra-Sil treatments provide enhanced chemical resistance on the following, but not limited to:

Table I ACI Standard 302.1R-89 Chemical hardeners can be used to increase concrete resistance to chemicals Including, but not limited to the following:

- Aluminum sulfate
- Ammonium chloride
- Barium hydroxide
- Beef fat
- Calcium hydroxide
- Calcium nitrate
- Carbon dioxide
- Carbonic acid
- Castor oil
- Coal-tar oils
- Cottonseed oil
- Creosote
- Cresol
- Distillers slop
- Ethylene glycol
- Ferric chloride
- Ferric sulfate
- Ferrous chloride
- Ferrous sulfate
- Fish oil
- Fruit juices
- Glucose
- Glycerine
- Hydrogen sulfide
- Iodine
- Lactic acid, 25%
- Lead refining solutions
- 10%Lignite oils
- Machine oils
- Magnesium chloride
- Magnesium sulfate
- Manganese sulfate
- Manure
- Mash fermenting
- Mercuric chloride
- Mercurous chloride
- Mine water, waste
- Mineral oil
- Molasses
- Mustard oil
- Nickel sulfate
- Oleic acid, 100%
- Olive oil
- Paraffin
- Phenol, 25%
- Phosphoric acid, 85%
- Pickling brine, 10%
- Poppy seed oil
- Potassium aluminum sulfate, 10%
- Potassium carbonate
- Potassium chloride
- Potassium dichromate
- Potassium persulfate
- Potassium sulfate
- Rapeseed oil
- Sea water
- Silage
- Sodium bromide
- Sodium carbonate
- Sodium chloride
- Sodium dichromate
- Sodium nitrite
- Sodium sulfate, 10%
- Sodium sulfite, 10%
- Sodium thiosulfate
- Soybean oil
- Sugar
- Sulfite liquor
- Tallow and tallow oil
- Tannic acid
- Tanning liquor, 10%
- Tobacco
- Walnut oil
- Zinc chloride
- Zinc sulfate

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LIMITATIONS

- Pentra-Sil 244+ is designed to react with acidic or alkaline siliceous substrates. The active ingredients in the sealer treatment may not chemically react with neutral pH or acidic substrates.
- Not suitable for asphalt surfaces
- Do not apply to glazed brick or tiles
- Pentra-Sil will not bridge water intrusion of visible cracks of 10 mils (.25 mm) or larger and is not designed for use on surfaces experiencing hydrostatic pressure.
- The sealer is not intended to serve as a waterproofing material
- Do not use below grade or for extension below grade

APPLICATION PROCEDURE & INSTRUCTIONS

(Always test each concrete surface for suitability and desired results. Let surface dry before inspection and approval of the desired application.)

Mix well before using. Application by spray, roller or brush to new or old concrete. Surfaces to receive Pentra-Sil 244+ should be clean and free of all foreign materials such as bond breakers, curing agents, form release oils, grease, dust, construction laitance, drywall residue etc. We don't recommend citrus cleaners for concrete, but if a d-Limonene (citrus) based cleaner is used, the surface must be neutralised using a high pH detergent (i.e. TSP, Tide, Cascade etc.) before applying Pentra-Sil 244+. All standing water should be removed before application.

Horizontal Application: Use an airless, or HVLP sprayer to apply Pentra-Sil 244+ to form an even, glistening sheen. Apply enough Pentra Sil 244+™ to keep the surface wet for 20 minutes If areas dry out before that, apply more product. Apply when surface and air temperatures are 40˚F to 100˚F (4˚C to 38˚C).

Vertical Application: Apply from the bottom up using a low pressure, 10 – 25 psi (68.9 – 172 kPa) sprayer with a fan-type nozzle. Flood surface until excess runs down 6" to 8" (152 – 203 mm) below spray pattern nozzle or sponge surfaces sufficiently to create a uniform wet-look. Proper quantity on horizontal surfaces is indicated when the solution stands for a few seconds before completely penetrating. For maximum penetration and desired coverage rates, a wet-on-wet application is recommended; retreat within three to five minutes after initial application. A brush or roller can be used. When a brush or roller is used, repeated applications should be made until the surface retains moisture for a minute or so before solution disappears. Distribute any pools of material with a broom.

Because the porosity of substrates and application conditions can vary greatly, Convergent Concrete is not responsible for any shortfalls or excess consumption based on the estimated yield and coverage rates noted above. For precise rates of consumption, a pre-application field test should be performed.

Make certain the most current version of the Pentra-Sil Product Datasheet and MSDS are being used.

Proper application is the responsibility of the user. Field visits by Convergent Concrete personnel are for the purpose of making technical recommendations only and not for supervising or providing quality control on the job site.

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FINAL RESULTS

Typical drying time is 1-2 hours for both vertical and horizontal surfaces.

Floors are ready for traffic and use when dry. Sanding or polishing will only wear down the protective surface and is not recommended for industrial applications unless it is being used as a surface enhancer for polished concrete acting as polishing agent.

A light lithium residue may form on the surface after the surface is dry. This is excess Pentra-Sil 244+ that was not absorbed and can be removed with a stiff broom, power sweeper or floor machine (if required). Water repellency and hardness continue to develop for up to seven days following the application; however, significant results should be visible within 24 hours.

On smooth concrete, for an immediate shine, allow the Pentra-Sil 244+ to dry overnight and then polish with a high-speed propane buffer equipped with black pad, followed by a red pad. Or run an auto-scrubber over the surface with nylo-grit or strato-grit brushes and vacuum going (but no water). Buffing with a black pad followed by a red pad will make smooth surfaces shine more quickly.

Second applications are rarely needed; however, if concrete is very porous or if a quicker sheen is desired, you may apply a second, very light application. Lightly mist the surface with Pentra-Sil 244+, spread evenly with a lamb's wool applicator or soft broom, and let dry.

Proper application is the responsibility of the user. Field visits by Convergent Concrete personnel are for the purpose of making technical recommendations only and not for supervising or providing quality control on the job site.

CLEAN UP

Use water to clean tools and equipment. Pentra-Sil treatments are environmentally friendly and require no special or hazardous disposal methods.

MAINTENANCE

Routine sweeping, mopping, washing and mechanical scrubbing of floors with neutral pH cleaners/water is recommended.

DO NOT USE acidic or citrus cleaners to maintain the floor. Although Pentra-Sil is chemically resistant and helps reduce staining, acidic and citrus cleaners may etch the surface causing a residual stain. Regular maintenance will improve surface shine. This will prolong the life of the floor surface and over time will increase the sheen. Wipe up any chemical spills as soon as possible.

Wait 6-12 hours after application before painting, line- stripping, or applying resilient tile, and conduct an adhesion test. For line-stripes, we recommend lithium Transil® Traffic Marking and Safety Paint™. Use a stiff broom or power sweeper to remove dirt and dust from the surface. Please consult the manufacturer to inquire about surface preparation and recommendations. Always test adhesion and performance for suitability and desired results before application.