



Pentra-Sil^{AE} (NL) Concrete Chemical Hardener, Sealer and Densifier

Convergent Group S.A. Chemical Concrete Treatments

Po Box 1 – Rue de Mesnil 34
B-5670 Viroinval
Belgium - Europe
Office: +32 60 390 752
Fax: +32 60 390 751
www.convergent-group.com



(Patented) Nano Lithium™ (NL)
Concrete Floor Treatments

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PRODUCT DESCRIPTION

Pentra-Sil^{AE} (NL) Concrete Chemical Hardener, Sealer and Densifier is a patented Nano Lithium™ surface treatment that both penetrates and seals by reacting chemically to the concrete surface forming a clear, dense, durable and hard inorganic topical surface layer that is breathable, abrasion-resistant, and extremely hard. It is excellent for concrete floors needing long-term protection against heavy wear and abuse, moisture, dirt and grime buildup, as well as protection against alkalinity and efflorescence (salt residue.) Pentra-Sil^{AE} (NL) is a colorless, odorless water-based solution that is V.O.C. compliant and environmentally safe to use.

KEY BENEFITS

Penetrates deep inside the concrete capillaries chemically reacting with the free lime forming a permanent insoluble bond with the concrete.

Forms a protective surface layer that is breathable, dense and abrasion resistant.

Creates a stronger, more impenetrable, and better-looking finish (satin – glossy) that is dust-proof, resistant to staining and deterioration.

Reduces maintenance, cleaning costs and costly repairs.

UNIQUE CHEMISTRY

Pentra-Sil's unique reactive chemistry forms an insoluble bond with the free lime forming an extremely strong Tri-calcium silicate compounds that bind together micro particles (lime and fine aggregate) forming a non-expansive gel that rapidly cures into inorganic cement that is stronger, more durable than the cement itself. Pentra-Sil's unique atomic structure (Particle Size) and lower viscosity to conventional treatments provides superior penetration within the capillary channels providing a more consistent and uniform cure. The patented Advanced Nano Lithium (NL) technology will not absorb water or effect alkalinity

Table 1.



Magnification 200X
Untreated



Magnification 200X
Treated

and is suitable for both interior and exterior applications on new or existing concrete.

Treated surfaces maintain the sheen even against pedestrian and traffic wear and regular maintenance. Floors last longer and cost less to maintain and aesthetically look better over time. In fact, the surface sheen increases with age and regular maintenance from a satin to a glossy clear finish.

See Table 1. (For visual descriptions of magnified views.)

ADVANTAGES

- Molecular size of Lithium provides for deeper penetration more permanent protection.
- Non-soluble / Non-expansive Lithium will not absorb water or cause the floor to sweat (SSF).
- Will not scratch or peel.
- Chemically reacts with concrete to produce insoluble calcium silicate hydrate making it harder and less permeable.
- Reduces dusting for cleaner and safer environments.
- Easy one coat application. No water wash required.
- Can be applied on fresh, newly troweled concrete and tilt-up construction slabs.
- Curing compounds can be applied on top of treated surfaces to provide ultimate hydration without discoloring or whitening the surface.
- Does not contain sodium or potassium salts that may contribute to surface crazing, efflorescence, and surface ASR.
- Provides high reflectivity (surface sheen) that beautifies concrete and holds up to heavy traffic and improves aseptically over time.
- Treated surfaces require no waxing and provide immediate sheen that improves over time with normal wear and maintenance.
- Water based, contains no solvents, low order. Low VOC content, < 50g/L.
- Permanent and durable surface resists marks, improves traction, and helps prevent waterborne contaminants for staining.
- Makes concrete easier to clean, creating an environment that is less susceptible to the proliferation of harmful bacteria.
- Prevents efflorescence and the leaching of lime.
- USDA approved for incidental food contact.
- Extends the life expectancy, and integrity of the floor lasting longer than other floor sealer, hardener, or densifier technology.
- Little or no downtime.

PACKAGING

15 L Plastic Basket	16 Kg
25 L Plastic Pail	26 Kg
220 L Drum	235 Kg.
1000 L tote (IBC)	1160 Kg.

Primary Industrial Markets Served

Industrial & Manufacturing

Manufacturing plants
Warehouse storage facilities
Distribution centers
Food processing plants
Textile mills
Wastewater treatment plants
Pharmaceutical
Electronic
Cold Storage / Freezers
Beverage processing
Chemical processing
Electronics

Transportation

Parking garages
Aircraft hangars
Automotive dealerships
Parking decks
Transportation terminals
Vehicle maintenance areas

Commercial & Institutional

Business office buildings
Cafeterias/restaurants
Correctional institutions
Retail & shopping centers
Schools/education facilities
Sports & entertainment venues
Stadiums

Health Care

Hospitals
Animal holding facilities
Health care facilities
Veterinary clinics

Common Areas

Aisleways/corridors
Chemical areas
Clean rooms
Cold storage
Kitchens
Laboratories
Loading docks
Lobby areas
Mechanical rooms
Mezzanines
Restrooms & shower areas

USE & TECHNICAL SPECIFICATIONS

COVERAGE / TREATMENT YIELD*

Steel Troweled 1 liter per 9.8 to 13.5m²
Broom Finished 1 liter per 6 to 8.5m²

*Coverage rate will vary with each concrete quality

DRYING TIME

1-2 hours

PHYSICAL PROPERTIES

Form	Clear, pale light green, water-based solution
Total Solids	16%
Active Ingredients:	100% of total solids
Specific Gravity:	1.11
pH	11.0
Flash Point:	N/A
V.O.C. Content 50<gms/L	0 lbs/gal or 0 g/L per gallon of coating
Freeze point	32F(0)
Slip Resistance	Does not change floor friction coefficient*
Depth of Surface Penetration	2-8mm
Shelf Life	1 year in factory sealed container

*Must employ all recognized slip and fall prevention techniques

COMPLIANCES

Recommended for use on concrete classes both new and existing surfaces as noted in ACI Standard 302.1R-89

Safe for use in Food & Drug Processing Industries

FRICTION TEST DATA

Pentra-Sil treatments exhibit properties and characteristic indicated in table 1

Friction
This series of tests were conducted according to ASTM C-1028-96 guidelines. All samples had a machine trowel finish. The Pentra-Guard sample was also polished with diamond discs up to 1000 grit.

RESULTS:

Dry untreated specimen = 0.710
Wet untreated specimen = 0.480

Pentra-sil treated specimen	
Dry = 0.710	Wet = 0.470

INTERPRETATION:

The dynamics of friction on concrete are very complex. This testing can only be interpreted to mean that Pentra-sil products do not significantly alter the friction qualities of the surface they are applied to. All standard methods for accident prevention must be used in situations where slip and fall or traction concerns exist.

Abrasion resistance (ASTM C 779*)

Taper Abrader

ASTM E96 Standard Test Methods for Water Vapor Transmission of Materials

ACI Standard 302.1R-89

Pentra-Sil treatments provide enhanced chemical resistance on the following, but not limited to: (see Table 1)

LIMITATIONS

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

This information contained herein, is to the best of our knowledge and belief, accurate and is to be used as a guide to product selection. However, since the conditions of handling, installation and use are beyond our control, we make no guarantee of results. When in doubt, please test first.

- Pentra-Sil is not suitable for asphaltic or non cementitious surfaces or painted surfaces
- Pentra-Sil will not bridge or fill cracks and will not salvage honeycombed or structurally unsound surfaces.
- Pentra-Sil is not recommended for plastic concrete or mortar or resin-based terrazzo mixes.
- Do not allow Pentra-Sil to dry on terrazzo (resin-based) floors except as indicated in application instructions.
- Do not allow Pentra-Sil to come in contact with any glass, fabric, metal, or painted surfaces. Immediately wipe contaminated surfaces with a clean water-saturated cloth, then wipe dry with a second clean cloth.
- For subsequent coatings applications, perform proper surface preparation and consult the coating manufacturer for more instructions.

CUSTOMER SERVICE:

(+32 60 390 752) to verify the most current versions or visit our website:

www.convergent-group.com

APPLICATION PROCEDURES & INSTRUCTIONS

Application by spray, roller or brush to new or old concrete

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

NEW CONCRETE

Pentra-Sil may be applied to newly installed concrete immediately after final trowel.

Thoroughly clean the substrate so it is free of all foreign materials such as bond breakers, curing agents, form release oils, dust, construction laitance, drywall residue etc. Use an airless, or HVLP sprayer to apply Pentra-Sil so as to form an even, consistent, monolithic glistening sheen and to ensure complete saturation of the surface. Apply enough Pentra-Sil to keep the surface wet for 20 minutes. Let the surface dry. (Usually 1 to 2 hours). Follow with an ASTM C 309 approved curing agent.

TILT-UP CONSTRUCTION APPLICATIONS

Pentra-Sil may be applied immediately after finishing operation and then a wet-cure or bondbreaker/curing material shall be applied over the top of Pentra-Sil curing material or bond breaker manufacturer's instructions. When a curing compound must be applied to freshly placed concrete, use a water dissipating non-resin / non-film forming curing compound. Prior to applying the bond breaker, use the above procedure, then apply bond breaker as the curing agent on top of the Pentra-Sil treatment.

EXISTING (OLD) CONCRETE

Pentra-Sil may be applied to existing, cured concrete of any age. All surfaces must be clean and sound. Mechanically remove any surface laitance and patch or fix cracks and damaged areas. Remove all membrane forming curing compounds, sealers, oil, grease, dirt, dust and other containments. We recommend thoroughly cleaning surface with black scrubbing pad (light abrasion) and a neutral pH detergent. We recommend NOT etching the surface with an acidic solution because it requires thorough rinsing using a neutral pH cleaner to effectively neutralize the surface (if not properly neutralized the pH may cause whiting.) by brushing and a thorough water rinsing. For best results clean the surface by sanding the floor with a 60-100 grit sanding screen or diamond abrasive pad. Remove, dust and residue with riding or walk-by "scrubber" using water or broom then water rinse and squeegee surface dry.

Use an airless, or HVLP sprayer to apply Pentra-Sil so as to form an even, consistent, monolithic glistening sheen and to ensure complete saturation of the surface. Apply enough Pentra-Sil to keep the surface wet for 20 minutes. Let the surface dry.

Make certain the most current versions of Pentra-Sil Product Data sheet and MSDS are being used; Please read this information prior to use; call Customer Service (+32 60 390 752) to verify the most current versions or visit our website: www.convergent-group.com

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

FINAL RESULTS

Floor is ready for traffic and use when dry. Typical drying time is 1-2 hours.

For optimal hardening and performance results we recommend that you do not sand or polish the surface. Treated surfaces will exhibit a slight satin sheen and reduced water absorption. Maximum strength and resistance will develop over 7 days. The

surface will increase its hardness and durability and its sheen over time - taking on a polished look with general maintenance. Sand or polishing will only wear down the protective surface and is not recommended for industrial applications. If an immediate, glossy finish (polished look) is desired for light industrial applications or commercial retail, we recommend the following procedure to achieve an enhanced brilliant sheen

OPTIONAL TOP COAT

For increased immediate shine, water repellency, chemical and stain resistance apply a light top-coat of Pentra-Sil 244+™ Salt Protection & Dust Proofer - Hardener, Sealer, Densifier 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 PentraSil 244+ then spread evenly with a lamb's wool applicator or soft broom, and let dry. Additional information on Pentra-Sil 244+ can be found on our website www.convergent-group.com.

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 mild conventional cleaners and detergents or water is recommended

DO NOT USE acidic cleaners to maintain the floor. Although Pentra-Sil is chemically resistant and helps reduce staining, its application in specific chemical environments and some acidic concentrates, may etch the surface causing a residual stain. If unsure, check with a Convergent Concrete technical representative. Regular maintenance cleaning will improve surface shine. Use a non citric based degreaser and regular mopping or scrubbing of the floor. This will prolong the life of the floor surface and over time will increase the sheen ("polished look".) Wipe up any chemical spills as soon as possible. Prior to painting, stripping, or applying resilient tile wait 6-12 hours after application and conduct an adhesion test. Use a stiff broom, "power sweeper" to remove dirt and dust off the surface. Please consult the "manufacturer" to inquire about surface preparation and recommendations. Always test adhesion and performance for suitability and desired results before overall application.

AVAILABILITY

Treatments must be applied by an "Authorized Applicator" or "Licensed Field Service Specialist." Pentra-Sil concrete treatments are available from Factory Direct Concrete Floor Care Centers or through direct "Authorized Applicators" from our plant and warehouse in Mariembourg, Belgium. For the name and telephone number of your nearest Pentra-Sil representative, call our customer service department listed on the back page.

**TECHNICAL SERVICE
CUSTOMER CARE:**

+32 60 390 752

EMAIL:

technical@convergent-group.com

WEB:

www.convergent-group.com

FOR MEDICAL EMERGENCY ONLY:

Anti Poison BE 070 245 245 Outside USA
(352) 323-3500

COST

Pentra-Sil/Æ (NL) treatments are competitively priced. Costs will vary from region to region. A Pentra-Sil representative can provide price information or assist in contacting the nearest Pentra-Sil stocking Concrete Floor Care Center.

TECHNICAL SERVICES

A staff of factory trained service personnel offers design assistance and technical

support. For technical assistance, contact our Technical Service Department: Technical Service Customer Care +32 60 390 752. Email: technical@convergent-group.com or go to: www.convergent-group.com

FILING SYSTEMS

Architects' First Choice/Æ

MANU-SPEC/Æ

Sweet's/Æ

Arcat/Æ

HEALTH AND SAFETY PRECAUTIONS

Pentra-Sil (NL) is an aqueous Lithium silicate solution that uses proprietary compounds. The treatment is alkaline and may cause eye and skin irritation.

KEEP OUT OF THE REACH OF CHILDREN. Do not take internally. Avoid prolonged contact with skin. Avoid ingestion of material. If swallowed, do not induce vomiting – call physician. Avoid contact with eyes. Protective clothing is recommended. Protective goggles are recommended in case of splashing. If splashed in eyes, wash immediately with clean water and call physician. Contact areas should be thoroughly washed with soap and water. Additional precautions, safety information and first aid treatments are contained in the Material Safety Data Sheet. Pentra-Sil will etch glass and painted surfaces. Immediately wash off with water all overspray from glass and painted surfaces. Caution: Surfaces wet with Pentra-Sil may result in a slippery surface

FOR INDUSTRIAL USE ONLY

Not for sale to or resale to general public. For professional use only and must be applied by an authorized applicator or licensed field service specialist.

WARRANTY

LIMITED WARRANTY NOTICE Every reasonable effort is made to apply Convergent Group SA exacting standards both in the manufacture of our products and in the information that we issue concerning these products and their use. We warrant our products to be of good quality and will replace or, at our election, refund the purchase price of any products proved defective. Satisfactory results depend not only upon quality products, but also upon many factors beyond our control. Therefore, except for such replacement or refund, Convergent Group MAKES NO WARRANTY OR GUARANTEE, EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE OR MERCHANTABILITY, RESPECTING ITS PRODUCTS, and Convergent Group shall have no other liability with respect thereto.

Any claim

regarding product defect must be received in writing within one (1) year from the date of shipment. No claim will be considered without such written notice or after the specified time interval. User shall determine the suitability of the products for the intended use and assume all risks and liability in connection therewith. Any authorized change in the printed recommendations concerning the use of our products must bear the signature of the Convergent Group Research Director. This information and all further technical advice are based on Convergent's present knowledge and experience. However, Convergent assumes no liability for providing such information and advice including the extent to which such information and advice may relate to existing third party intellectual property rights, especially patent rights. In particular, Convergent Group disclaims all WARRANTIES, WHETHER EXPRESS OR IMPLIED, INCLUDING THE IMPLIED WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE OR MERCHANTABILITY. CONVERGENT GROUP SHALL NOT BE RESPONSIBLE FOR CONSEQUENTIAL, INDIRECT OR INCIDENTAL DAMAGES (INCLUDING LOSS OF PROFITS) OF ANY KIND. Convergent Group reserves the right to make any changes according to technological progress or further developments. It is the customer's (Authorized Applicator) responsibility and obligation to carefully inspect and test any incoming goods. Performance of the product(s) described herein should be verified by testing and carried out only by qualified experts. It is the sole responsibility of the customer to carry out and arrange for any such testing. Reference to trade names used by other companies is neither a recommendation, nor an endorsement of any product and does not imply that similar products could not be used.

Other Pentra™ Treatments

Pentra-SiÆ (244+)

Salt Protection and Dust Proofer -Hardener, Sealer, Densifier

Pentra-Guard™ (HP)

High Performance Surface Hardener and Protective Clear Coat.

Pentra-SilÆ (C&N)

Concrete Cleaner and Neutralizer

Pentra-SilÆ (AC)

Alkalinity Control Formula and Primer

Pentra-Guard™ (EXT)

Exterior Surface Hardening and Protective Clear Coat.

Pentra™-Protective Coating

Industrial Topcoat Finish and Surface Hardener.

Pentra™ (MMC) Penetrating Sealer

Exterior Mold and Mildew Control

TRANSIL™

Traffic Marking and Safety Paint

For additional information on Pentra-SilÆ (NL) Concrete Chemical Sealer, Hardener, Densifier or any of our other specialty Pentra™ treatments contact your local Specialty Chemical **"Concrete Floor Care Center"** or local dealer representative for an **"Authorized Applicator."**

Unique Strengths, Unmatched Performance.™

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