Pentra-Sil™ Protection for Concrete Floors

Cures, Seals, Chemically Hardens & Dustproofs your Concrete Floor

INTRODUCTION

Norton Construction Products patented Pentra – Sil Liquid Hardener uses exclusive lithium chemistry to make the best concrete hardener and densifier available today. Concrete is exposed to harsh chemical, mechanical, and atmospheric elements that can cause the concrete to deteriorate. Pentra – Sil penetrates into the substrate where it reacts with weak calcium hydroxide to form stronger and more stable tricalcium silicate hydrate. The lithium component is also effective in mitigating and preventing damaging alkali-silica reactions. It is a colourless transparent liquid that penetrates concrete, protecting, preserving and strengthening it. It does this by penetrating the surface and solidifying the components of the concrete into one solid mass.

FORWARD

- ASR Protection - It contains Lithium, the only chemical hardener that can help mitigate and prevent damaging alkali-silica reactions (ASR) in concrete.
- It helps cure the concrete
- It seals the concrete – micro channels in concrete are sealed against water and chemical attack
- It hardens the concrete – approximately 40% harder than non-treated concrete and more abrasion resistant
- It dust proofs – creating a cleaner, healthier environment
- Permanent – one penetrating application is all that is needed. No coating to peel, chip or wear off.
- Easy maintenance – makes cleaning easier and reduces staining.

Good floor surfaces don't just happen. They are a culmination of many factors including good concrete mix design, low water: cement ratio concrete, mechanical vibration during placement, good curing and protection of the finished surface.

Pentra – Sil protects a floor against dusting, pitting, and spalling.

Pentra – Sil produces a densified concrete through a chemical reaction with the products of cement hydration.

Pentra – Sil is extremely effective in assisting the curing of concrete in warm weather when applied immediately after the finishing process and kept wet for 45 minutes.

Pentra – Sil seals concrete floor surfaces into a solid mass by densifying the microscopic pore structures.

Pentra – Sil makes concrete surfaces 40% harder within 30 days. This is best measured as an increase in 6-8 on the Moh's Scale.

Pentra – Sil combines with the products of cement hydration and cement salts, becoming an integral part of the matrix, thus completely dust proofing the surface.

Typical application for high traffic distribution centre. Sealing, dustproofing, hardening & cleanability.

Pentra-Sil application

SURFACE PREPARATION

Freshly finished concrete : None Required. Existing Concrete : Sweep, scrub or strip concrete to remove any surface contamination or curing film.

PRODUCT DESCRIPTION

Colourless, odourless, non-toxic, non-combustible, non-flammable. Complies with all VOC regulations.

ASR PROTECTION

ASR is a worldwide problem that occurs when the alkali in the 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 uses exclusive lithium ion technology that does not contribute to the alkalinity and can even help prevent ASR.

SEALING
As Pentra – Sil 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. It also leaves a sheen on the floor that is much easier to maintain.

HARDENING
Pentra – Sil 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.

ECONOMICAL
Pentra – Sil is much less expensive than urethanes and epoxy coatings, and much more durable. Epoxies and Urethanes need to be stripped and re-applied every 3-5 years, at great expense. Pentra-Sil will not peel, tear, or wear off – one application is all that is needed.

CURING TIME
Pentra-Sil seals and cures the concrete by permanently locking the matrix pore structure from within. The process continues over time but is essentially complete within 90 days.

APPLICATION
Can be applied to new or existing surfaces. Applications are only to be performed by licensed, certified applicators to ensure quality and owner satisfaction. On fully cured concrete, the treated surface can be used as soon as it is dry to the touch. (Usually 1-2 hours), using low-pressure sprayer, brush or roller. After 30 minutes remove residue with vacuum or squeegee.

DRYING TIME
1 to 2 hours. The surface may be used as soon as the application is complete and the surface is again dry to the touch. Newly laid surfaces require the normal period for concrete to develop adequate compressive strength, usually 28 days.

COATS REQUIRED
Generally one coat depending on porosity of the surface.

COLOUR
Clear Sheen.

PRIMER
None required.

ABRASION RESISTANCE
ASTM C 779 – Depth of Wear. Abrasion resistance – revolving disks. 32,5% improvement at 30 minutes.

CURING
Moisture loss during critical initial 24 hour period was determined on treated and untreated samples in a controlled environment cabinet : 93% more moisture loss from untreated samples.

HARDENING
ASTM C39 – 40% increase in compressive strength at 7 days, 38 % increase at 28 days over untreated samples. ASTM C 805 – Schmidt Hammer: 13.3% increased impact resistance.

FRICTION
ASTM C-1028 – Coefficient of friction on steel troweled Pentra-Sil treated samples: 0.86 dry, and 0.69 wet, far less slippery than reference tile (0.71 and 0.47).

WEATHERING
ASTM G23 – Ultra violet light and water spray exposure had no adverse effect on Pentra-Sil treated samples.

WHAT TO EXPECT DIRECTLY AFTER TREATMENT
No surface film or coating present to peel or blister. The floor will have a satin sheen. The shine will intensify with time, use and maintenance. Optimum water repellency and hardness develop within seven days. Do not use acidic cleaners

Aggressive cleaning with a neutral to high pH detergent works best for long term maintenance. The Pentra – Sil treatment will also help force contaminants out of the concrete, provided the floor is regularly cleaned.

WHAT TO EXPECT AFTER 12 MONTHS
With a good cleaning programme the floor will have an attractive satin sheen and the surface will be hard-shell. Most foods and liquids will not penetrate the surface.

MAINTENANCE TIPS
Clean the floor often. The abrasion polishes the floor and brings up the shine. Us a low pH detergent to clean the floor. Clean up spills quickly. Acid concentrates can etch the surface.

CLIENTS HAPPY WITH PENTRA-SIL TREATMENT
Coca Cola, DELTA Airlines, Federal Express, Michelin, Motorola, Westinghouse, Caterpillar, Chrysler, Volvo, UPS, Boeing, Honda, John Deere, IBM, Honda, SEARS, Pennzoil, American Airlines, General Electric, General Motors, Ikea, VW, Pepsi Cola, Dow Corning, Wall Mart.

VERSUS DRY SHAKE HARDENERS

PENTRA-SIL	DRY SHAKE
Becomes part of the concrete surface and can never delaminate or spall.	Application requires high level of expertise to ensure no risk of delamination.
Prevents ASR	Cannot prevent ASR
Reduces Chloride Ion Penetration by over 90%.(See Pentra - Sil 244+ Product)	Cannot reduce Chloride Ion Penetration.
Assists with important curing of the concrete	Does not assist in the curing of the concrete.
Coverage is very accurate.	Coverage is at best highly variable.

OTHER PENTRA-SIL PRODUCTS

Pentra - Sil 244+™ All the benefits of Pentra – Sil but includes an exclusive chloride ion screen that reduces salt penetration into concrete by over 90% as tested by WJE following the NCHRP 244 procedures. Ideal for marine / coastal concrete structures, bridges, harbours etc.

Pentra-Protect™ – Performs as a system in combination with Pentra-Sil and Pentra-Sil 244+. Ideal for parking facilities, maintenance areas, workshops, service bays and manufacturing areas. System is oil repellent and protects against staining from greases, hydraulic fluids, fuels, oils and fatty materials. It penetrates, is invisible and is breathable. At last a system that can safely and effectively protect your surface from unsightly staining without the negative characteristics of coatings.

VERSUS EPOXY COATINGS

PENTRA-SIL	EPOXY
Can be applied as soon as concrete has set. Speeds up construction.	Must wait 28 days for concrete to cure before you can apply the coating.
One can have full traffic on the floor immediately after application	Must wait 7 days for epoxy to cure before using the floor.
Lasts a lifetime.	Another coating application is likely in 3-5 years.
Gives a perpetual shine and all qualities get better as time passes.	Quality of coating shall only worsen as time passes.
Part of the concrete floor – you cannot remove it.	Is a coating and can be scratched and removed.
20 Year warranty.	1 to 10 year maximum.
Will not peel or debond.	Will wear, scratch and has potential to debond and peel.
Odourless, Non Hazardous, No Solvents, No volatile Compounds.	Often solvent borne with volatile compounds.
One coat application	Often a two coat application.

Pentra-Sil colours

Nestle distribution centre

Mazda workshop

Maytag

Helicopter hanger

CLF Concrete Laser Flooring Pty (Ltd)
PO Box 2589, Witkoppen, 2068, Johannesburg, SA • www.norcon.co.za
Tel: +27 11 704 5557 • Fax: +27 11 462 1456 • E-mail: info@norcon.co.za

CLF Concrete Laser Flooring (Pty) Ltd