

Phillip Island Bridge, Victoria, treated with Tech-Dry Solid Silane

SOLID SILANE

A Silane Cream formulated to protect reinforced concrete from water & chloride ion induced corrosion

Description

SOLID SILANE contains 80% n-octyltriethoxysilane as a water-based thixotropic cream for reinforced concrete to resist water and chloride ion ingress. The silane cream is a new concept that overcomes the problems associated with liquid silanes such as isobutyltriethoxysilane. SOLID SILANE can be applied to overhead and vertical surface without run off. The high penetration depths achieved with SOLID SILANE are due to the low volatility of the silane, combined with the long contact time with the surface. Unlike liquid silanes, one coat of SOLID SILANE is generally enough to achieve similar penetration depths as several coats of liquid silane. Application costs can thus be reduced.

SOLID SILANE is used on reinforced concrete structures such buildings, wharves, and bridges to prevent water and chloride ion induced reinforcement corrosion. Some of the important features of SOLID SILANE include:

- » Water-based cream containing over 80% active silicones.
- » Ability to deeply penetrates into dense concrete.
- » Does not splash or run off uncontrollably on overhead and vertical surfaces.
- » No pollution of waterways and atmosphere due to no run off and low evaporation.
- » Easy quality control by measuring the wet film thickness.
- » Permanently bonds to the concrete with no peel or blister.
- » Forms UV, alkali stable and durable hydrophobic zone within concrete surface.
- » Significantly reduces water penetration and harmful salts such as chloride ions.
- » Does not significantly change the surface appearance and vapour permeability.

Use instructions

APPLICATION

It is imperative that USE SPECIFICATION FOR THE IMPREGNATION OF CONCRETE WITH SOLID SILANE is read, understood and strictly followed before application. SOLID SILANE should be applied to dry concrete preferably by high pressure airless spray equipment. It should be operated at a lower possible pressure with a high possible spray tip to avoid high shearing which can cause cream to break down. For small area it can be applied by brush or roller. One coat of at 200 to 400 ml/ m² is usually sufficient for concrete of strength up to 50mPa. Do not splash or spray the product onto any area you do not wish to treat. If splashing occurs the product should be removed with a damp cloth immediately

APPLICATION RATE

The application rate may vary depending on the impregnation depth required and condition of the concrete. It may be of the order of 2-5 m² per litre per coat or could be out of this range significantly. However, in order to ensure the high penetration depth, enough silane cream should be delivered on to the surface. A maximum wet film thickness may be controlled so that the wet cream should stay on the surface until it is absorbed by the concrete without run off. If the concrete is of high density or less permeable, no more than 200ml/m² of silane cream may be applied per coat. A second coat is then required after the first coat is dry to ensure a high penetration depth, although the second coat is generally unnecessary.

AFTER APPLICATION

The initial water repellency will develop after the surface is dry. Full curing may take up to 7 days. Avoid heavy traffic or any staining for at least 24 hours. Wash the equipment in water.

PILOT TESTING AND QUALITY CONTROL

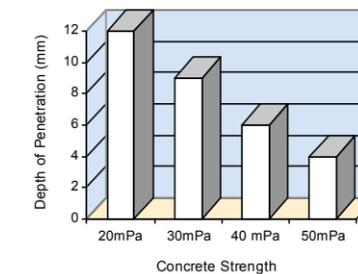
Due to the variation of concrete, it is strongly recommended that a pilot test on a small area on site MUST be conducted prior to application. Please refer to the USE SPECIFICATION FOR THE IMPREGNATION OF CONCRETE With SOLID SILANE for quality control.

Tests & Performance

DEPTH OF IMPREGNATION

A single application of SOLID SILANE at about 300ml/m² can penetrate up to 12 mm into 20 mPa concrete. Figure 1 shows the penetration depth of concrete of different strength treated with SOLID SILANE at about 300ml/m².

Figure 1. Depth of impregnation of treated concrete



WATER AND CHLORIDE ION EXCLUSION

Table 1 below shows that both water and chloride ion absorption rate of the concrete of 40mPa treated with one coat of SOLID SILANE at about 300ml/m² is reduced by over 90% comparing to that of untreated concrete.

Table 1: Reduction of water and chloride ion absorption

	Water absorption	Chloride ion absorption
Reduction of absorption	>93%	>92%

Typical Data

Appearance:	White Cream
Active ingredient:	>80%
Specific Gravity:	0.9 g/ml at 20°C
pH value:	7-8
Solubility in water:	miscible in water
VOC content:	Nil
Flash point:	>61°C

Important Note

SOLID SILANE penetrates into the capillaries and renders the concrete surface water repellent while still leaving most of the capillaries open to allow water vapour to pass through. It reduces water absorption by capillary action. However, it has a limited resistance to water penetration particularly under prolonged contact or hydrostatic pressure. Therefore, in some cases where the concrete is very permeable or there is extreme wind driven rain, resistance to water penetration or harmful salts such as chloride ions may not be adequate.

Handling & Storage

SOLID SILANE is a non-hazardous material. However, as with all chemical products, good industrial hygiene procedures should be followed when using this product. Refer to the material safety data sheet for safe handling. Vapour inhalation and skin or eye contact should be avoided by wearing proper protection. Wear an air-purifying respirator if there is a risk of exposure to high vapour concentrations. Wash hands after handling. The product should be stored in closed containers in a cool dry place away from any fire and ignition sources. The product has a shelf life of 6 months in a sealed original container under 25oC.

USE UNDER SUFFICIENT VENTILATION AWAY FROM ANY FIRE OR IGNITION SOURCES!

KEEP OUT OF REACH OF CHILDREN!

Packaging

SOLID SILANE is available in 20 litre pails and 200 litre drums.

Disclaimer

The information given in this data sheet is based on many years of experience and is correct to the best of our knowledge. As the storage, handling and application of this material are beyond our control; we can only be responsible for the quality of our product at the time of dispatch. We reserve the right to alter certain product parameters within the spectrum of properties in order to keep abreast of technical advances. It is the responsibility of the end user to determine the suitability of this material for any particular application.





Silane Treatment of Concrete

The silane treatment of reinforced concrete is a proven way of protecting reinforced concrete from corrosion caused by water and chloride ion.

Liquid Silanes

The commonly used silanes are very low viscosity, volatile liquids that are difficult to apply in windy or hot conditions. Additionally, two or three individual coats are required to achieve an acceptable penetration depth.

A New Concept

SOLID SILANE is a new concept that overcomes the problems associated with the use of liquid silanes. SOLID SILANE is an Alkyltrialkoxo Silane, formulated as a non-drip thixotropic emulsion.

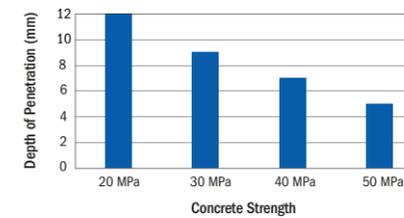
SOLID SILANE can be applied to any surface (overhead, vertical and horizontal) without run off. The silane gel remains on the surface for up to 2 hours ensuring deep and even penetration into the concrete. The high penetration depths achieved are due to the low volatility of the silane gel, combined with the long contact time with the surface.

Time Savings

One coat of SOLID SILANE will achieve similar penetration depths as several coats of liquid silane; application costs can thus be reduced.

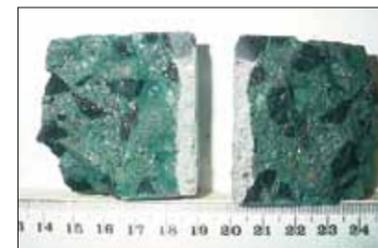
No waste

Unlike liquid silanes, SOLID SILANE does not run off surfaces uncontrollably. The material remains on and penetrates into the area it was applied to. This reduces waste and potentially damaging over-spray and contamination of waterways.



Depth of Penetration

SOLID SILANE penetrates evenly and deeply into concrete. A single application of 500ml/m² can penetrate up to 12mm into 20MPa concrete.



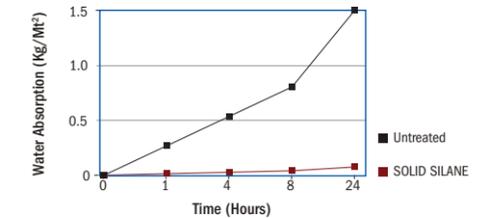
Core samples removed from a new bridge structure revealed a 5-7mm penetration depth in the 50MPa concrete.

Testing

SOLID SILANE was tested and its effectiveness proven by Taywood engineering and the Victoria University of Technology.

Quality Control

The quality control for on-site application is simplified when using SOLID SILANE. Areas treated with SOLID SILANE are clearly visible as the product is a lingering white gel. The long contact time enables accurate measurement of the application rate using a film thickness gauge.



Water & Chloride Ion Exclusion

SOLID SILANE significantly reduces the water and chloride ion absorption of concrete.

Application

SOLID SILANE is best applied using conventional airless spray equipment. Generally one application is required as the product can be applied at up to 500ml/m².

The typical application rate on high quality 50MPa concrete is 200ml per square meter per coat.

Vertical and horizontal overhead application is easier as the product does not drip uncontrollably onto the operator and other surfaces. The low runoff is especially valuable during the treatment of marine structures where it is vital not to pollute the marine environment.

