



Protectosil® CIT

Advanced surface-applied corrosion inhibitor for steel reinforced concrete based on organo-functional silanes

Uses

A penetrating treatment applied to the surface of reinforced concrete and concrete encased steel framed structures designed to delay the ingress of moisture and chlorides. Protectosil® CIT offers two-phase protection, penetrating concrete and chemically bind to steel reinforcement within concrete, inhibiting corrosion induced by high chlorides and/or carbonation in existing concrete. Suitable for decks, facades, balconies, walkways, bridge decks, beams and columns. Is also suitable for marine applications including jetties, piers and sea defence walls (in tidal zone and above).

Advantages

- Penetrates deeply into concrete substrates
- Effective on dense concrete and even moist concrete
- Can be applied directly to embedded steel surfaces
- Chemically binds within concrete pores and to steel rebar
- Inhibits chloride ion induced corrosion of steel reinforcement even when the onset of corrosion has occurred
- Suitable for use on carbonated concrete
- Reduces the absorption of moisture and chloride ions into concrete, increasing resistivity
- Effectively inhibits macro cell (mat to mat) and microcell (along bar) corrosion of steel-reinforced concrete
- Suitable for old and new structures
- Does not change concrete's appearance
- Simple to apply and no need to wash off residue
- Does not require complex design
- Does not require continuity of reinforcement
- Fast drying and does not wash out
- Can be utilised under Nitoflor and Nitodek system
- UV Stable so can be left as a clear finish
- Can be applied prior to protective surface finishes (to be confirmed following test work)
- Can act as a primer for Fosroc Dekguard range of anti-carbonation coatings.

Description

Protectosil® CIT has a >98% active content of organofunctional silane formulation, which penetrates deeply into reinforced concrete and then reacts to produce a bonded hydrophobic lining to the concrete pores and surface of steel rebar.

This treatment reduces rates of any ongoing chloride or carbonation induced corrosion in existing concrete by reducing water content, increasing resistivity and forming a passive layer on the reinforcement, delaying the onset of chloride induced corrosion in new and old concrete.



The absorption rates of water and chlorides are reduced, however the passage of water vapour is unaffected, therefore the treatment allows the moisture within the concrete to diffuse out. The treatment is not affected by UV light and does not produce discolouration of the substrate. Once dried, Protectosil® CIT will not be washed out by weathering, tidal action or other intermittent passage of moisture.

Specification Clause

The corrosion inhibitor shall be Protectosil® CIT supplied by Fosroc, a combined surface applied impregnating corrosion inhibitor and clear coating, with a penetration depth greater than 10mm in normal concrete and with a drying time of a maximum of 2 hours. The product shall be applied in 2 - 3 coats at an application rate per coat of 180 - 250g/m² to a correctly prepared surface in accordance with the manufacturer's written instructions. A total application rate of at least 500g/m² should be achieved.

Standard compliance

Tested to BS EN 1504-2. Can be used according to principles 1.1, 2.1, 8.1, 9.1 & 11.3 of EN 1504-9

Properties

Specific gravity:	Approximately 0.88
pH:	11
Colour:	Clear to slightly amber
Penetration depth (EN1504-2 Table 3):	Class II: ≥ 10mm
Water absorption coefficient compared to the non-treated sample (EN 13580):	< 7.5%
Absorption coefficient after storage in alkali solution (EN 13580):	<10%
Drying speed for hydrophobizing impregnation (EN13579) :	Class II: >10%



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Substrate Preparation

All delaminated, loose or spalled concrete must be removed and repaired utilising established concrete repair methods. The Fosroc Renderoc range of products may be used for repairs as required. Shrinkage cracks that are dormant, shallow in depth and with no structural significance can be treated with a multiple coat application of Protectosil® CIT. Other cracks should be repaired using the Fosroc Nitofill crack Injection resin range prior to application of Protectosil® CIT.

The concrete surface must be clean and free from frost. All traces of dirt, dust, efflorescence, mould, grease, oil, asphalt, laitance, paint, coatings, curing compounds and other foreign materials which would inhibit penetration must be removed. Acceptable cleaning methods include shot blasting, sand-blasting, high pressure water jetting and grinding. Chemical cleaning may be required in some circumstances to remove remnants of organic materials.

For ideal absorption conditions, the substrate should be dry as possible, allow at least 24 hours following rain or after substrate preparation by water-jetting before commencing application of Protectosil® CIT.

When applying in tidal or splash zones, the substrate should be allowed to dry for as long as possible between tides, no visible surface water should be present. As the concrete pores will still contain moisture, additional coats of Protectosil® CIT are required to obtain the total required absorption levels for protection.

Application

Apply Protectosil® CIT to the entire concrete surface including any patch repairs. In order to obtain the penetration and protection properties of Protectosil® CIT, it is important that the correct rates of application and overcoating times are observed. Protectosil® CIT should not be diluted before application.

Number of coats (dry concrete):	2 – 3 coats
Number of coats (tidal / splash zones)	5 – 6 coats
Application rate per coat:	0.20 - 0.28 L/m ² 180 - 250 g/m ²
Note: a total of >500g/m ² (>0.56 L/m ²) must be achieved.	

Overcoating time at 20°C: Minimum 15 minutes (surface must be visibly dry before overcoating).

Protectosil® CIT should be applied using low-pressure pumping equipment with a wet fan-type spray nozzle. Protectosil® CIT should not be atomized. Alternative methods include roller, brush or pouring (into a crack). Ensure that sufficient material is applied such that, after application, horizontal surfaces have a shiny, wet appearance for several seconds.

Vertical surfaces should exhibit a 30 – 50 cm shiny curtain of liquid. The entire concrete surface including any repairs should be treated with Protectosil® CIT.

When applying directly to embedded steel surfaces, such as at the perimeter of repair areas, ensure any heavy rust deposits are first removed. Do not over-apply Protectosil® CIT in any single application.

Packaging

Protectosil® CIT:	28, 205 or 1000L containers
Fosroc Solvent 102:	5 and 25 litre tins

Storage

Protectosil® CIT has a shelf life of 12 months when stored in original unopened containers in cool, dry conditions. (Minimum -10°C and Maximum +50°C)

After seal is initially broken, material within bulk containers should be consumed within 30 days. Keep bulk containers tightly closed after decanting required material. Any decanted material should be consumed within 24 hours.

Limitations

The application of Protectosil® CIT should not commence if substrate temperatures are less than -5°C or above 40°C. Do not apply if rain is expected within four hours of application or if high winds or other ambient conditions prevent proper application.

There is a possibility of colour change on some types of polymer modified facing materials and white cement. A trial area is recommended.

Protectosil® CIT should not be applied to substrates which will be subjected to permanent water immersion during service (intermittent / cyclic immersion is acceptable).

When applying Protectosil® CIT to structures where the onset of corrosion has already taken place, the extent of the reduction in corrosion rate is case by case dependent.

If Protectosil CIT is to be used in conjunction with thin section polymer modified repair mortars such as Renderoc FC, Renderoc FCR or Renderoc ST05, always apply Protectosil CIT prior to the repair material.

Health and safety

Use appropriate personal protective equipment (overalls, chemical resistant gloves, ventilator, and eye protection). For further information refer to appropriate Product Safety Data Sheet.

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Overspray

Precautions must be taken to control overspray when working adjacent to vehicular roadways, pedestrian walkways, water courses and plant life. Non-absorbent surfaces such as window frames, metal, plastic, window glass should be covered before application.

Fire

Fosroc Solvent 102 is flammable.

Protectosil® CIT is flammable.

Do not expose to naked flames or other sources of ignition.

No Smoking. Containers should be tightly sealed when not in use. In the event of fire, extinguish with CO₂ or foam

Cleaning

Equipment should be cleaned with Fosroc Solvent 102 immediately after use. Any spillages should be absorbed with sand or sawdust etc., and disposed of in accordance with local regulations.

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Important note

Fosroc products are guaranteed against defective materials and manufacture and are sold subject to its standard Conditions for the Supply of Goods and Services, copies of which may be obtained on request. Whilst Fosroc endeavours to ensure that any advice, recommendation, specification of information it may give is accurate and correct, it cannot, because it has no direct or continuous control over where or how its products are applied, accept any liability either directly or indirectly arising from the use of its products, whether or not in accordance with any advice, specification, recommendation of information given by basis. All Fosroc datasheets are updated on a regular basis. It is the user's responsibility to obtain the latest version.

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