



# Nitocote FBC\*

High performance elastomeric, protective coating for concrete and masonry

## Uses

Nitocote FBC is designed to protect atmospherically exposed, reinforced concrete structures (above any splash zones) from attack by chloride ions, oxygen and moisture ingress, especially where there is a danger of subsequent cracks appearing within the substrate.

Typical uses include, but are not necessarily limited to, the following:

- Coastal environments
- Bridge structures
- Concrete storage tanks - external surfaces
- New and existing structures

## Advantages

- **High performance** - comprehensive barrier against carbon dioxide, water, sulphates and chloride ions
- **Crack accommodation** - withstands substrate cracking up to 2 mm and cyclic movement up to 1 mm
- **Breathable** - water vapour can escape from the structure
- **Extremely durable** - maintains elastomeric performance, with high recovery, even after long term UV weathering

## Specification

Where shown on the contract documents, the protective coating system shall comprise the following elements:

- a) A penetrating silane-siloxane primer (Nitocote FBC Primer)
- b) A single component, elastomeric, aliphatic acrylic coating (Nitocote FBC)

The total dry film thickness of the protective coating system shall be not less than 200 microns, and shall provide:

- a) CO<sub>2</sub> diffusion resistance equivalent to not less than 125 mm of 30 N/mm<sup>2</sup> concrete cover or 50 m of air cover (Taywood method)
- b) A water vapour transmission resistance (S<sub>D</sub>) of not more than 0.32 m (Taywood method)
- c) Static crack accommodation of not less than 2 mm (BRE).
- (e) Adhesion greater than 1.0 N/mm<sup>2</sup> as per BS 1881.

## Description

Nitocote FBC is an elastomeric, water-based protective coating based on a special acrylic polymer. It provides excellent elongation & recovery, resistance to aggressive elements, UV light and rain. It is available in a wide range of colours. The complete system also includes a film-forming, stabilizing primer (Nitocote FBC Primer) which is supplied as a clear liquid and is based on an acrylic resin and a silane-siloxane dissolved in a penetrating organic carrier. The primer is reactive and capable of producing a chemically-bound hydrophobic barrier, thus inhibiting the passage of water and water-borne contaminants. A thin surface film is produced which consolidates and stabilizes porous substrates. The Nitocote FBC system thus comprises a single component penetrating silane-siloxane primer and a single component elastomeric pigmented coating, both ready for immediate site use.

## Design criteria

To achieve the desired protective properties, the Nitocote FBC system must be applied to the substrate at the correct coverage rates. The coating should thus be applied in 2 coats to achieve a total dry film thickness of not less than 200 microns.

## Properties

The values obtained are for the Nitocote FBC system applied at the minimum recommended application rate:

<b>Solids by weight</b>	: 64%
<b>Volume solids</b>	: 50%
<b>Carbon dioxide diffusion resistance - Equivalent thickness of air (Taywood method)</b>	: > 175 metres
<b>Carbon dioxide diffusion resistance Equivalent thickness of 30N conc. (Taywood method)</b>	: > 500 mm
<b>Water vapour diffusion resistance (Klopfer method - eff. Resist. S<sub>D</sub> &lt; 4 m)</b>	: S <sub>D</sub> 1.0 m @ 200 microns dft
<b>Chloride ion diffusion coefficient (Taywood method)</b>	: No chloride ion : diffusion after 60 days
<b>Static crack spanning capability @ 200 microns dft @ 23°C (modified ASTM C836-76)</b>	: 2 mm
<b>Tear resistance (ASTM D1004-76)</b>	: 15 N/mm
<b>Tensile Strength (ASTM D412-87)</b>	: 5.0 N/mm <sup>2</sup>
<b>Reduction in Water absorption (ASTM C642)</b>	: > 82%
<b>Reduction in chloride ion penetration (AASHTO M259)</b>	: > 92%
<b>Adhesion (BS 1881)</b>	: 1.0 N/mm <sup>2</sup>

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## Instructions for use

Application over existing membranes and/or coatings

It is not necessary to remove Fosroc's Nitobond AR or Rendercure prior to the application of Nitocote FBC. However, for all other types of membrane or coating; it is advisable to carry out trials to determine both compatibility with Nitocote FBC, and retention of bond between the underlying coating or membrane and the substrate. For further advice, contact the local Fosroc office.

## Substrate preparation

All surfaces should be dry and free from contamination such as oil, grease, loose particles, decayed matter, moss, algal growth, laitance, and all traces of mould release oils. This is best achieved by lightly grit-blasting the surface to the point where the fine aggregates are exposed but not polished. Where moss, algae or similar growths have occurred, treatment with a proprietary biocide should be carried out after the grit-blasting process. It is essential to provide an unbroken coating of Nitocote FBC. Thus all blow holes and similar surface irregularities should be filled using the appropriate Renderoc\* product. Several grades of Renderoc are available to suit all types and thickness of repair, but all should be allowed to cure properly before the application of Nitocote FBC. Consult the local Fosroc office for further details.

## Substrate priming

A primer coat is required to penetrate and 'stabilize' the substrate. The depth of primer penetration and thus its coverage rate are determined by substrate profile, porosity & general condition. Hence for low permeability concretes, primer penetration will be low & area covered per litre will be high - permeability may be affected by cement replacements (e.g. microsilica). It is thus recommended that a general coverage rate of 4 m<sup>2</sup>/litre be observed, noting that this may change according to substrate condition. Any areas of glass should be masked. Plants, grass, joint sealants, asphalt and bitumen-painted areas should be protected during application. The primer is best applied by using portable spray equipment e.g. knapsack-type. A uniform surface appearance (sheen) should be apparent when the required rate of application rate has been achieved. If any matt, porous patches remain, then a further application of Nitocote FBC Primer should be made. If in any doubt regarding substrate priming, contact local Fosroc office.

## Supplementary information

Application rates and coverage of Nitocote FBC may be varied according to particular service conditions. However, to ensure that the desired performance properties of the material are attained, it is important to observe correct application procedure.

## Application

The correct application rates and overcoating times should be observed, in order to obtain the complete benefits of the protective properties of the Nitocote FBC system, except where substrate condition dictates different application rates for the primer.

	Nitocote Primer	Nitocote FBC
<b>Number of coats</b>	: 1	2
<b>Theoretical application rate per coat</b>	: 4 m <sup>2</sup> /litre	5 m <sup>2</sup> /litre
<b>Theoretical wet film thickness per coat</b>	: n/a	200 microns
<b>Overcoating time</b>		
@ 20°C	: 2 hours	When firm
@ 35°C	: 1 hour	to the touch

The primer should be allowed to dry for a minimum of 2 hours @ 20°C (or 1 hour @ 35°C) before application of Nitocote FBC. Under no circumstances should the primer be overcoated until the surface is properly dry.

Nitocote FBC should preferably be applied by airless spray equipment, but can also be applied by roller. For further information about application techniques and equipment consult the local Fosroc office.

All primed substrates should be treated with 2 coats of Nitocote FBC. It is important that no gaps or 'raw edges' appear in the finished coating. Special care should be taken to provide an unbroken coating at external corners and similar exposed protrusions.

The first coat should be applied to achieve a uniform coating with a wet film thickness not less than 200 microns. This coat should be allowed to dry until firm to the touch. Typically, this will be after approximately 12 hours in dry weather @ 35°C.

Prior to application of the second coat, a close visual inspection of the surface should be made to check for any pin holes or surface irregularities. Any such irregularities should be filled with Nitocote FBC Filler\*, and allowed to dry before proceeding. The second coat of Nitocote FBC should be applied at 90° to the first, to ensure a final full unbroken coating to the substrate. The second coat should once more be applied at a wet film thickness of not less than 200 microns. In order to maintain a record of the coating activities a coating log should be kept.

## Cleaning

Nitocote FBC and Nitocote FBC Filler should be removed from tools and equipment with clean water immediately after use. Nitocote FBC Primer should be removed using Fosroc Solvent 102\*.



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## Limitations

- Where application over existing sound coatings or paints is required, trials should be conducted to ensure compatibility and retention of the bond between the underlying coating and the substrate. Compatibility and soundness should be assessed on a trial area
- Nitocote FBC should not be used in submerged or permanently wet conditions. Consult local Fosroc office for recommendations
- Application should not commence if the temperature of the substrate is below 20°C or above 60°C, or where the prevailing relative humidity exceeds 90%
- In conditions of high relative humidity i.e. 85 - 90% good ventilation conditions are essential. Substrate temperature should be at least 3°C above dew point
- Nitocote FBC should not be applied in windy conditions where early-age dust adhesion may occur, or where rain is likely within 2 hours

## Hot weather working practices

Whilst the performance properties of Nitocote FBC at elevated temperatures are assured, application under such conditions can sometimes be difficult. It is therefore suggested that, for temperatures above 35°C, the following guidelines are adopted as a prudent working regime:

- a) Store unmixed materials in a cool environment (preferably temperature controlled), avoiding exposure to direct sunlight
- b) Keep application equipment cool, arranging shade protection if necessary. It is especially important to keep cool those surfaces of the equipment which will come into direct contact with the material itself
- c) Try to eliminate application in the middle of the day, when ambient temperatures will be excessively high
- d) Ensure that there are sufficient operatives available to complete application within the pot life of the material
- e) Have a ready supply of Fosroc Solvent 102 available for immediate cleaning of tools after use

## Storage

When stored in cool, dry conditions, away from sources of heat & naked flames in original, unopened packs, all products have 12 months shelf life. If stored at high temperatures and/or high humidity conditions it may be reduced. Nitocote FBC should be protected from frost.



### 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 Service.

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Cert No. THR2004006

## Estimating

### Supply

<b>Nitocote FBC Primer</b>	: 20 litre drums
<b>Nitocote FBC</b>	: 20 litre drums
<b>Nitocote FBC Filler</b>	: 19 litre drums
<b>Fosroc Solvent 102</b>	: 4 & 20 litre cans

### Coverage

<b>Nitocote FBC Primer</b>	: 4.0 m <sup>2</sup> per litre (total)
<b>Nitocote FBC</b>	: 2.5 m <sup>2</sup> per litre (total)

The coverage figures given are theoretical - due to wastage factors and the variety and nature of possible substrates, practical coverage figures will be reduced.

## Precautions

### Health and safety

Nitocote FBC Primer, Nitocote FBC and Fosroc Solvent 102 should not come in contact with the skin and eyes, or be swallowed. Ensure adequate ventilation and avoid inhalation of vapours. Some people are sensitive to alkalis, resins and solvents. Wear suitable protective clothing, gloves and eye protection. If working in confined areas, suitable respiratory protective equipment must be used. The use of barrier creams provides additional skin protection. In case of contact with skin, rinse with plenty of clean water, then cleanse with soap and water. Do not use solvent. In case of contact with eyes, rinse immediately with plenty of clean water and seek medical advice. If swallowed, seek medical attention immediately - do not induce vomiting. For further information, refer to the Product Material Safety Data Sheet.

### Fire

Nitocote FBC is non-flammable. Nitocote FBC Primer and Fosroc Solvent 102 are flammable. Keep away from sources of ignition. No smoking. In the event of fire, extinguish with CO<sub>2</sub> or foam. Do not use a water jet.

### Flash points

<b>Nitocote FBC Primer</b>	: 38°C
<b>Fosroc Solvent 102</b>	: 33°C

\* Denotes the trademark of Fosroc International Ltd.

↑ See separate data sheet