

Expancote* FBC*

Aliphatic, acrylic, structural protective coating

Uses

Expancote* FBC is designed to protect atmospherically exposed, reinforced concrete structures 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:

- Bridges, Harbours, and Jetties
- Concrete storage tanks - external surfaces
- New and existing structures

Advantages

- Barrier against CO₂, H₂O, sulphates & chloride ions.
- Crack accommodation - withstands substrate cracking up to 2 mm.
- Breathable - permits water vapor escape from the structure, anti-fungal and anti-Bactria coating
- Extremely durable, elastomeric and heat resistant

Description

Expancote* FBC is an elastomeric structural protective coating, resistant to aggressive atmospheric elements and is available in a wide range of colours.

The Expancote* FBC system comprises of a single component primer, a single component elastomeric pigmented coating and a single component filler, all ready for immediate site mixing and usage.

Design criteria

Expancote* FBC should be applied in two coats to achieve a total dry film thickness of not less than 200 microns, in order to obtain the protective properties.

Properties

The values obtained are for the Expancote* FBC system applied at the minimum recommended application rate.

Solids by weight	: 64%
Volume solids	: 50%
Improvement in UV Reflectivity (ISO-Tech 11L 350 Dig. Light Meter)	: >100%
Re-radiation of infra red light	: >95%
Resistance to heat and humidity (NFT-30-802)	: Resistant
Chloride ion diffusion coefficient (Taywood method)	: Nil after 180 days
Reduction in chloride ion penetration AASHTO M259	: >92%
Carbon dioxide diffusion resistance - DCO₂ (Taywood method)	: 7.86 X 10 ⁻⁸ cm ² s ⁻¹
Water vapour transmission rate DH₂O	: 5.59 x 10 ⁻⁵ @ 200 microns dft
Reduction in Water absorption (ASTM C642)	: >90%
Static crack spanning capability @ 200 microns dft @23°C (modified ASTM C836-76)	: 2 mm
Abrasion resistance (ASTM D4060 - CS10-1kg-100cycles):	: 22mg wt loss
Impact Resistance (ISO 6272)	: No disbondment cracking or unsticking
Adhesion ASTM D4541	: >1.0 N/mm ²
Adhesion after exposure to salinated fog (NFT-30-062)	: 1.65 N/mm ²
Resistance to salinated fog (NFT-41-002)	: Resistant



Specification

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

- (i) a penetrating silane-siloxane primer (Expancote* FBC Primer), and
- (ii) a single component, elastomeric, aliphatic acrylic coating. (Expancote* FBC)

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

- (a) CO₂ diffusion resistance (DCO₂) lesser than 2x10⁻⁷(Taywood method),
- (c) Breathability greater than 5 x 10⁻⁵,
- (d) Static crack accommodation of 2mm (modified ASTM C836-76).
- (e) Adhesion greater than 1.0 N/mm² as per ASTM D4541.

Instructions for use

Application over existing membranes and/or coatings It is not necessary to remove Expanchem Expanbond* AR or Expancure* prior to the application of Expancote* FBC.

However, for all other types of membrane or coating; it is advisable to carry out trials to determine both compatibility with Expancote* FBC, and retention of bond between the underlying coating or membrane and the substrate. For further advice, contact the local Expanchem Fospak 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 Expancote* FBC. Thus all blow holes and similar surface irregularities should be filled using Expanmortar* BF and should be allowed to cure properly before the application of Expancote* FBC. Consult the local Expanchem Fospak office for further details.

Substrate priming

A primer coat is required to penetrate and 'stabilize' the substrate. The depth of penetration of the primer, and thus its coverage rate, are determined by substrate profile, porosity and general condition.

Hence for low permeability concretes, primer penetration will be low and 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 4m²/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 Expancote* FBC Primer should be made. If in any doubt regarding substrate priming, contact the local Expanchem Fospak office.

Application

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

	Expancote* FBC Primer	Expancote* FBC
Number of coats	1	2
Theoretic application rate per coat	4m ² /ltr	5m ² /ltr
Theoretical wet film thickness per coat	n/a	200 microns
Overcoating time:		
@ 20°C	2 hours	when firm to the touch
@ 35°C	1 hour	

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



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Prior to commencing application of Expancote* FBC, any surface irregularities should be filled with Expancote* FBC Filler*, and allowed to dry.

Expancote* 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 Expanchem Fospak office.

All primed substrates should be treated with two coats of Expancote* 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 at 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 Expancote* FBC Filler*, and allowed to dry before proceeding.

The second coat of Expancote* 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

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

Technical support

Expanchem Fospak offers a comprehensive technical support service to specifiers, end users and contractors. It is also able to offer on-site technical assistance, an AutoCAD facility and dedicated specification assistance in locations all over the world.

Estimating

Supply

Expancote* FBC Primer	: 30 litre drums
Expancote* FBC	: 20 litre drums
Expancote* FBC Filler	: 19 litre drums
Expantomtar* BF	: 10 kg bag
Expanchem Solvent 102	: 5 litre drums

Coverage

Expancote* FBC Primer	: 4.0 m ² per litre (total)
Expancote* FBC	: 2.5 m ² per litre (total)
Expantomtar* BF	: 5.8ltrs per 10kg bag

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

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.
- Expancote* FBC should not be used in submerged or permanently wet conditions. Consult the local Expanchem Fospak 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.
- Expancote* FBC should not be applied in windy conditions where early-age dust adhesion may occur, or where rain is likely within 2 hours.

Storage

When stored in cool, dry conditions, away from sources of heat and naked flames, in the original, unopened packs, all products have a shelf life of 12 months.

If stored at high temperatures and/or high humidity conditions the shelf life may be reduced. Expancote* FBC should be protected from frost.



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Precautions

Health and safety

Expancote* FBC Primer, Expancote* FBC and Expanchem 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 provide 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.

Fire

Expancote* FBC and Expanmortar* BF are non-flammable. Expancote* FBC Primer and Expanchem Solvent 102 are flammable. Keep away from sources of ignition. No smoking. In the event of fire, extinguish with CO₂ or foam. Do not use a water jet.

Flash points

Expancote* FBC Primer	:	38°C
Expanchem Solvent 102	:	33°C

For further information, refer to the Product Material Safety Data Sheet.

Supplementary information

Application rates and coverage of Expancote* 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.

Hot weather working practices

Whilst the performance properties of Expancote* 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:

- (i) Store unmixed materials in a cool (preferably temperature controlled) environment, avoiding exposure to direct sunlight.
- (ii) 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.
- (iii) Try to eliminate application in the middle of the day, when ambient temperatures will be excessively high.
- (iv) Ensure that there are sufficient operatives available to complete application within the pot life of the material.
- (v) Have a ready supply of Expanchem Solvent 102 available for immediate cleaning of tools after use.



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* Denotes the trademark registered.

REGIONAL SALES OFFICES IN PAKISTAN:

Fospak (Pvt) Ltd.

Head Office

702, Business Avenue,
Block-6, PECHS., Shahra-e-Faisal,
Karachi, Pakistan.

Tel # +92-21-34528477, 34529859

Fax # +92-21-34522436

Email : info.khi@fospak.com.pk

Lahore Sales Office

2nd Floor Sarwar Shaheed Plaza,
Cavalry Ground,
Main Boulevard, Lahore Cantt,
Lahore, Pakistan.

Tel # +92-42-36675773

Fax # +92-42-36675838

Email : info.lhr@fospak.com.pk

Rawalpindi Sales Office

1st Floor,
Al-Harmain Plaza,
Main Murree Road,
Rawalpindi, Pakistan.

Tel # +92-51-9290592

Fax # +92-51-9290590

Email : info.isb@fospak.com.pk

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