Cemprotec E942

Cementitious Coating for Concrete and Steel

Product Overview

Two component, epoxy and polymer modified cementitious coating. CE-marked in accordance with BS EN 1504-2.

Uses

Waterproofing and protection of concrete where enhanced chemical and abrasion resistance are required. Also for providing a stand-alone anti-corrosion coating for ferrous metals. Suitable for surface protection systems principles 1.3, 2.2, 5.1, 6.1,8.2 as defined in BS EN 1504-2.

Advantages

- Unique blend of surfactants enables easy brush or spray application. Produces a smooth finish, which rapidly recovers to prevent sagging.
- Pre-packaged material only requiring mixing with water on-site.
- Excellent adhesion to cementitious and steel substrates.
- Resistant to a range of chemicals and gases, including hydrogen sulphide.
- Excellent abrasion and impact resistance.
- Dense matrix offers low permeability to water at 10 bar positive and negative pressure and very high diffusion resistance to carbon dioxide gas and chloride ions.
- Hydrates to provide an alkaline environment which chemically reacts with the substrate to accelerate the passivation of steel and enhance the bond to concrete.
- Water-based, cures without the release of hazardous solvents. Equipment easily cleaned with water.

Description

CEMPROTEC E942 is a two component, water-based, epoxy and polymer modified cementitious coating for the protection of concrete and ferrous metals. It exhibits a high degree of thixotropy for easy application by brush or spray to give a smooth surface finish without sagging. It cures to form a dense, highly alkaline coating offering low permeability to water and very high diffusion resistance to chloride ions and oxygen, ensuring long-term protection.

Compliance

- CE-marked in accordance with BS EN 1504-2: Suitable for surface protection systems principles 1.3, 2.2, 5.1, 6.1,8.2 as defined in BS EN 1504-2.
- Compliant with LU Standard 1-085 ‘Fire Safety Performance of Materials’.

Specification Clause

The structural waterproofing coating shall be a two component, water based, epoxy and polymer modified cementitious coating, incorporating microsilica, fibre, epoxy and styrene acrylic copolymer technology. It shall be CE-marked in accordance with BS EN 1504-2, and shall comply with the following performance specification:

- Impermeable to water under 10 bar hydrostatic pressure such that a 2.0mm coating is equivalent to 6000mm of concrete.
- Oxygen diffusion resistance coefficient of at least 4.42 x 10-5 cm^2/sec in accordance with the Taywood Test.
- Adhesive strength of at least 2MPa onto concrete and 3MPa onto steel in accordance with BS 4551.

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EN1504-2: Surface Protection Systems - Coating
Protection Against Ingress (PIC) Rigid Trafficked System

Compressive Strength	:	Class II ≥50 MPa
Permeability to CO_2	:	Equiv. to 100mm of concrete
Permeability to Water Vapour	:	Class I < 5m
Capillary Absorption	:	Class III < 0.1 $kg.m^{-2}.h^{-0.5}$
Coefficient of Thermal Exp.	:	≤ 30 x $10^{-6}K^{-1}$
Therm. Comp. EN 13687-1	:	> 2.0 MPa
Adhesive Bond	:	≥ 2.0 MPa
Dangerous Substances	:	Complies with 5.4
Reaction to Fire	:	Euroclass A2-s1, d0

Technical Data / Mechanical Characteristics

Property	Standard	BS EN 1504-2 Requirement	Result
Compressive Strength	EN 12190	≥ 50 MPa (Class II)	28 days: 54.1 MPa
Compressive Strength Development @ 20°C	BS4551		1 day 5-10 MPa 7 days 30-40 MPa 28 days 50-60 MPa
Adhesive Bond	EN 1542	≥ 2.00 MPa	3.30 MPa
Permeability to CO_2	EN 1062-6	R≥ 50m	2mm equivalent to 100mm of concrete
Water Vapour Permeability (Equivalent Air Layer Thickness)	BS EN ISO 7783-2	Class 1 S_D ≤ 5m	S_D = 1.29m
Thermal Compatibility	EN13687-1	≥ 2.00 MPa	3.24MPa
Water Permeability Coefficient Equivalent Concrete Thickness	Vinci Test		1.43×10^{-17} m/sec 2mm = 6000mm of concrete
Resistance to Water Pressure	DIN 1048		10 bar (100m hydrostatic head) positive and negative)
Coefficient of Thermal Expansion	EN1770	≤ 30×10^{-6} K^{-1}	23.4×10^{-6} K^{-1}
Tensile Strength	BS 6319-7		4.93 MPa
Wear Resistance	EN13813		Exceeds BCA AR0,5: Highest classification of wear resistance
Liquid Water Transmission Rate (Capillary Absorption and Permeability to Liquid water)	EN 1062-3	Class III (low) w< 0.1kg.m^{-2}.$h^{-0.5}$	w = 0.01 kg.m^{-2}.$h^{-0.5}$
Thickness			2 x 1mm coats walls and vertical surfaces 1 x 2mm coat on decks and floors
Reaction to Fire	EN 13501-1	Euroclass	Euroclass A2 – s1, d0

The properties given above are obtained from laboratory tests: results obtained from on-site testing may vary according to site condition.

Application Instructions

Preparation

The areas to be treated must be free from all unsound material, i.e. dust, oil, grease, corrosion by-products and organic growth. Concrete should have a minimum strength of 20MPa and surfaces should be cleaned to remove release agents, curing compounds and surface laitance, preferably using wet grit or water blasting techniques or equivalent approved methods.

For maximum durability, steel should be cleaned back to bright metal, ideally to Sa2½ as defined in BS 7079: Part A1/ISO 8501 (SSPC.SP10) using an angular grit to achieve a surface profile of 75-110 microns. For marine structures, ultra-high pressure jetting at circa 20,000psi is effective.

Where environmental constraints preclude blast cleaning, lower forms of preparation are acceptable providing all loose oxides are removed. Handheld power tools capable of achieving the necessary preparation can be used. Metal prepared in this way should be to minimum standard of St 3 as defined in BS 7079: Part A1/ISO 8501 (SSPC.SP3). Arrises and welds should be ground to remove sharp edges.

Priming of Concrete

The prepared substrate should be thoroughly soaked with clean water until uniformly saturated without any standing water.

Priming of Steel

CEMPROTEC E942 is self-priming and requires direct contact with the steel to afford maximum corrosion protection.

Mixing

CEMPROTEC E942 is supplied as a two pack, Part A liquid and Part B powder. **The two components MUST NOT be split. All of Part A and all of Part B MUST be mixed.**

Shake Part A (liquid) and pour into a suitable mixing vessel. Slowly add the Part B (powder) and mix for a minimum of 5 minutes until homogenous, without any lumps. Mixing should be carried out using a slow-speed drill and paddle designed to entrap as little air as possible.

Please Note: It is vital to the success of the application that these instructions are strictly adhered to. Flexcrete cannot be held responsible for any product failures due to incorrect mixing.

Placing

CEMPROTEC E942 is ideally suited to brush application, although spray techniques should be used in large areas. Care should be taken to ensure that air is not entrapped onto the surface.

Apply the first coat, approximately 1mm thick, onto the prepared substrate. To ensure total protection, a second coat should be applied in the same way, after waiting approx. 60 minutes (depending on temperature) when the first coat is stable but not fully cured (max 7 days).

Carefully check on completion for pinholes and misses and spot treat where necessary. The total finished coating must be at least 2mm thick to provide complete protection. When treating structures in a tidal zone, **CEMPROTEC E942** should be applied in a single 2mm layer to avoid inter-coat contamination. **CEMPROTEC E942** must be allowed to cure for a minimum of 2 hours before being immersed.

Detail Work

On steel, apply a 1mm stripe coat of **CEMPROTEC E942** by brush to all welds, cut edges and fixings, e.g. nuts and bolt heads. On welds and cut edges, embed **CEMPROTEC EDGE SCRIM**. Over joints, large cracks, etc. in concrete, apply a 1mm stripe coat of **CEMPROTEC E942** by brush and immediately embed **CEMPROTEC 2000-S**. Allow to stabilise before proceeding. Please consult separate Technical Data Sheet.

Curing

Normal concreting procedures should be strictly adhered to. It is important that the surface of the mortar is protected from strong sunlight and drying winds with **FLEXCRETE CURING MEMBRANE WB**, polythene sheeting, damp hessian or similar (See separate Data Sheet for full details). In floor and deck applications, curing **MUST** commence within 10-15 minutes of the completed application of the coating.

Cleaning and Storage

All tools should be cleaned with water immediately after use.

Materials can be stored for 12 months in dry, frost free conditions with unopened bags at 20°C.

Packaging

CEMPROTEC E942 is supplied in 15kg or 30kg composite packs.

Yield and Coverage

Yield: 8.1 litres per 15kg pack
16.2 litres per 30kg pack.

On prepared substrates, a 15kg pack will cover 4m² per pack at 2mm thickness.

A 30kg pack will cover approximately 8.33m² at 2mm thickness.

Limitations

Do not use **CEMPROTEC E942** when the temperature is below 5°C and falling. Do not use **CEMPROTEC E942** on waterproof concrete without referring to the Flexcrete Technical Department. Not suitable for use on trafficked areas.

Health and Safety

Safety Data Sheets are available on request.

Application Top Tips

1. Regularly check coating thickness during application using the wet film thickness gauge available from Flexcrete.

2. Apply **CURING MEMBRANE WB** as an even fine mist spray. Do not over apply or allow to pond on the surface or cracking may occur.

3. **CEMPROTEC E942** is not a decorative coating and may dry with a patchy appearance until uniformly weathered. Can be overcoated with Flexcrete membranes to give a coloured finish.

4. In cold, humid conditions, condensation may form on surfaces treated with **CEMPROTEC E942**, resulting in darkening of the finish and retardation of set.

5. If the **E942** is allowed to cure for more than 7 days before application of the second coat, then the surface must be thoroughly cleaned and saturated before proceeding.

6. In a tidal zone, **CEMPROTEC E942** can be applied in a single 2mm layer. Allow **E942** to cure for a minimum of 2 hours before immersion. Protect from abrasion or aggressive tidal flow until set.

7. Cold Weather Working (See separate Guide)

- ≥3ºC on a rising thermometer.
- ≥5ºC on a falling thermometer.
- Do not use any Part A which has been frozen.

8. Hot Weather Working (See separate Guide)

- Store material in cool conditions to maximise working life.
- Shade applied material from strong sunlight.
- Spray apply a second coat of **CURING MEMBRANE WB**.
- If possible, avoid extreme temperatures by working at night.