Fosroc®
Nitocote CM210

constructive solutions

Cementitious, polymermodified waterproofing coating for concrete and masonry surfaces

Uses

Nitocote CM210 is a cementitious coating, used for waterproofing water retaining structures and water excluding structures.

Nitocote CM210 provides a waterproof coating suitable for use in water tanks, reservoirs, canals and culverts.

The material can be used on concrete, brick and blockwork substrates.

Suitable for application to below ground retaining wall and foundation structures including construction joints to maintain waterproofing continuity as part of a waterproofing solution conforming to BS8102:2022.

Advantages

- No primer required
- Suitable for light foot traffic prior to installation of protective finishes
- Withstands high positive and negative hydrostatic pressures
- Excellent bond to concrete and masonry
- Long working time for ease of application
- Easy application by brush, roller, trowel or spray
- Can be applied to green or damp concrete
- Effective barrier to sulfates and chlorides

Standards compliance

Nitocote CM210 complies with EN1504-2: Surface protection systems method 1.3 (Ingress Protection), 2.2 (Moisture Control), 5.1 (Physical Resistance) & 8.2 (Increasing Resistivity).

BS 6920: 2000 Effect on Water Quality.

Water Regulations Advisory Scheme (WRAS)approved.

Description

Nitocote CM210 two-component polymer modified cementitious coating is supplied in a pre-packaged form. The product has been designed to be easily mixed on-site using a slow speed drill and paddle and then applied to the substrate using a brush, roller, trowel or by spray application. Nitocote CM210, available in grey and white, cures to form a waterproof coating.

Specification clause

The waterproofing coating shall be Nitocote CM210, a cementitious product approved under the Water Regulations Advisory Scheme for use in contact with potable water. The cured coating shall have the capability to resist a positive water pressure of 7 bar and a negative water pressure of 3 bar when tested to DIN 1048. The product shall be applied in two

1mm thick coats (one coat white / one coat grey), to a correctly prepared substrate, in accordance with the manufacturer's written instructions.

CE	UKCA
0370 09 0370–CPR–0845	0836 22 UK 0836-CPR-21/F508
DOP: UK9-08	
Fosroc International Limited Drayton Manor Business Park, Coleshill Road, Tamworth, B78 3XN, UK	
Nitocote CM210	
EN1504-2: Surface protection systems methods 1.3, 2.2, 5.1, and 8.2	
Abrasion resistance	< 3000 mg
Permeability to CO_2	> 50 m
Permeability to water vapour	Class 1: < 5 m
Capillary absorption and permeability to water	< 0.1 kg/(m²h$^{0.5}$)
Impact resistance	Class III: ≥ 20 Nm
Adhesion strength by pull-off test	≥ 1.5 (flexible system with trafficking)
Fire classification	A2 s1 d0
Dangerous substances	Complies with 5.3

WRAS APPROVED MATERIAL

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Properties

Typical properties of mixed material:	
Pot life at 20ºC:	1 hour
Colour:	Grey or white
Mixed density:	1850 kg/m³
Minimum application temperature:	5ºC
Properties of cured coating (21 days cure at 23ºC followed by 28 days immersion at 23ºC). The values obtained are for Nitocote CM210 when applied in two coats each of 1mm wet film thickness:	
Resistance to positive water pressure (DIN 1048):	7 bar (70m head of water)
Resistance to negative water pressure (DIN 1048):	3 bar (30m head of water)
Static crack accommodation:	>1.0mm
Abrasion resistance:	Wear Index 1 (ASTM D 4060) equivalent to 40 N/mm² concrete
Chloride ion diffusion resistance (Taywood method):	No penetration after 12 months continuous testing
Permeability to Radon gas	9 x 10^{-9} m²/s
CO_2 diffusion resistance (Taywood method) after 5000 hours QUV* :	>50m

* Note QUV test required coating to be exposed to 4 hours condensation at 50ºC followed by 4 hours ultraviolet light at 50ºC. Total exposure time was 5000 hours.

Application instructions

Surface preparation

Any active water ingress should be stopped with a suitably approved plugging mortar such as Renderoc Plug.

All surfaces which are to receive the coating must be free from oil, grease, wax, dirt or any other form of foreign matter that might affect adhesion. Typically, concrete surfaces can be cleaned using a high pressure water jet and detergent. Poor quality, friable, or contaminated surfaces require suitable mechanical preparation.

Spalled surfaces or those containing large blow-holes and other such defects should be repaired using a Fosroc approved repair mortar or render. Care must be taken when choosing the repair mortar to ensure that it has all necessary approvals for contact with potable water if required. Contact local Fosroc office for advice on suitable materials.

If the surface contains small blow-holes, typically less than 1mm wide, the coating can be applied directly on to the substrate without the need for a treatment.

Pre-wetting of substrate

Thoroughly dampen the substrate surface with water using a brush, roller or spray. High porosity substrates will require more dampening than dense substrates. Do not apply the coating when the substrate is wet, but allow the water to soak in until the substrate is just visibly damp before proceeding. Any excess water should be removed. Contact the local Fosroc office for further advice on suitable materials.

Mixing

The liquid component should be poured into a plastic or metal drum having a volume of at least 25 litres.

This should be placed onto a plastic sheet to avoid contamination. The powder component is gradually added to the liquid whilst mixing with a Fosroc Mixing Paddle (MR3). or other approved spiral paddle attachment on a variable speed drill. Mixing is continued, constantly moving the paddle around the drum, until a lump-free slurry is obtained. This should take a minimum of 3 minutes and a maximum of 5 minutes.

Note: The preferred drill speed is between 250 and 750 rpm.

Mixing warning

Nitocote CM210 may exhibit satisfactory handling characteristics even though inadequately mixed. This will result in a significantly lower level of performance or possible failure. It is therefore essential that mixing instructions are strictly adhered to with particular emphasis on the time of the mixing operation.

Application generally

For optimum use of the product, Nitocote CM210 white should be applied as the first coat, with Nitocote CM210 grey as the second coat. This gives a visual indication of coverage.

The first coat should be applied at a wet film thickness of 1mm (coverage per coat is 1.8kg/m² or 1 litre/m²). To ensure the correct thickness is achieved, measure out an area (for example 200m²), then calculate how much material will be needed to cover this area. Monitor the coating thickness during application at regular intervals using a wet film gauge. Care must be taken to fill all imperfections such as blow-holes during application. Blow-holes can be filled while the coating is still fluid by using a dry sponge.

All the mixed material should be used within 1 hour of mixing.

Allow first coat to cure for a minimum of 4 hours at 20ºC/50% RH and longer at lower temperatures or higher humidities. The exact drying time will depend on surface temperature, relative humidity and air movement. High temperatures and/or low humidity will reduce the drying time. This can vary from 1 to 16 hours. The maximum ambient temperature for application is 40ºC.

The first coat should be left to dry until firm and unmarkable to the touch. There is no maximum time between coats, however the surface may need cleaning with water prior to application of the second coat to remove potential contamination.

The second coat should also be applied at a wet film thickness of 1mm. Pre-dampening of the surface is not necessary when applying the second coat.

Brush application

The most suitable type of brush is a soft bristled wallpaper paste brush (120 to 220mm wide). Where larger areas are to be applied it is advisable to use a brush with a handle.

Load the brush up well and spread the material to the required thickness. If the brush begins to drag during application, do not add water to the material but dampen the surface again. Finish in one direction for a neat appearance.

For floor application, a soft bristled broom is recommended. Pour the material on to the substrate and then spread to the required thickness.

Roller application

Application by roller has the benefit of speed over brush application, particularly on smooth substrates. A good quality medium hair roller is recommended. The roller should be well loaded for ease of application. A heavy roller pattern will be left, therefore it is important to use a finishing tool to produce a smooth coating, with a uniform 1mm wet film thickness.

Trowel application

Application with a steel plastering trowel also has the benefit of speed over brush application, as well as producing a superior finish. It is recommended that a scratch coat of Nitocote CM210 be applied prior to the first coating to fill blow-holes, which should be allowed to cure for the equivalent of 2 hours at 20°C.

Finishing tools

A finishing tool may be required to produce a smooth finish or to repair film defects. Examples of suitable tools include a steel plastering trowel, a caulking tool and a hard sponge. All of these must be used immediately after coating application, otherwise the coating may drag or tear. When using a hard sponge it should be dry or very slightly damp. A wet sponge should not be used as this will cause polymer to come to the surface of the coating which causes an unsightly white streaky effect.

Spray application

Spray application should be carried out using a suitable wet spray technique. This is the preferred method for applications to large areas. In smaller tanks with restricted access it may be beneficial to spray. This means the material will be pumped into the restricted area rather than having to be physically carried.

Mixing should be carried out as previously described, and particular care should be taken to ensure that no lumps remain in the mix. The mixing container should be placed on plastic sheeting to stop gravel and stones from contaminating the mix. Material should be scraped off the mixing bucket above the wet line after every mix. The paddle should also be cleaned at this stage. All of these precautions are important to stop dried material or gravel from causing blockages in the pump.

Pour the material into the hopper. Scrape the sides of the hopper down regularly to stop material from hardening and then dropping into the mix. Place a cover over the hopper to prevent product skinning caused by water loss.

The mixed material is pumped through the hose to the spray gun. Substrate preparation and coverage rates described above should be adhered to. Wet film thickness should be measured using a wet film thickness gauge every 2 to 3 metres initially until the sprayer has judged the ideal application speed and distance from the wall. Any areas less than 1mm thick per coat should be sprayed over again. For the rest of the application, thickness measurements should be carried out every 10m^2.

Cracks and construction joints

Proofex LM Mesh may be used to reinforce Nitocote CM210 at joints and cracks. The mesh should be bedded into the first coat while still wet. Immediately after placing apply a further thin coat of Nitocote CM210 to 'wet' out the mesh. Allow to set before applying the second coat. Static cracks greater than 1mm wide should be detailed as shown in Fosroc standard detail NCM07.

90° Corners

Nitocote CM210 should be applied over a 20mm Renderoc Plug 20 fillet and Proofex LM Mesh embedded as described above.

Sealed joints

Soft joints that are to remain exposed should be filled with a suitable joint sealant such as Nitoseal MS600 after application of Nitocote CM210 which should be returned into the joint faces.

For movement joints apply Nitocote CM210 up to the joint face. When cured apply Expoband H45 over the sealed joint (see data sheet) and allow to cure. Finally lap additional Nitocote CM210 onto the cured Supastik E10.

Curing

No curing membrane is necessary, however the freshly applied coating should be protected from rain and strong wind or until firm to the touch to prevent damage to the wet coating.

For contracts not requiring UK potable water approvals, allow a minimum cure time of equivalent to 7 days at 7°C (3 days at 20°C and above). Nitocote CM210 should be dry cured. This is to ensure the full physical properties are developed.

For UK wholesome water purposes where contracts require WRAS certifications, Nitocote CM210 should be mixed and applied as a two coat system in accordance with the manufacturer's Instruction For Use sheet (contact Technical Helpdesk).

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Brush apply coat 1 (white) and allow to dry for 4 hours at 20°C and 44% RH (relative humidity) before applying coat 2 (grey) and curing for 8 days at 7°C (total cure for both coats will be 8 days at 7°C). For use with water up to 23°C.

Cleaning and disposal

Immediately after application is completed, clean all tools and equipment with clean water. Hardened material can be removed by mechanical means and by use of Fosroc Solvent 102.

Waste material should be allowed to harden overnight then disposed of as non-hazardous waste.

Estimating

Supply

Powder component (grey or white):	18.2kg bag
Liquid polymer component:	5.0kg plastic container
Proofex LM Mesh:	100mm x 50m

Coverage

Coverage rate at 1mm wet film thickness:	12.5m² per pack 0.54m² /kg

The coverage figure given is theoretical - due to wastage factors and the variety and nature of possible substrates, practical coverage figures will be reduced. A minimum coverage of 3.6kg/m² applied in not less than two coats is recommended.

Limitations

Nitocote CM210 should not be used when the temperature is below 5°C. The product should not be exposed to rainfall or moving water during application or within 4 hours at 20°C. The maximum ambient temperature for application is 40°C.

Nitocote CM210 should not be used on external surfaces where an aesthetic appearance is critical because differences in environmental conditions during cure may cause colour differences in the final surface. If any doubts arise concerning temperature or substrate conditions, consult the local Fosroc office.

Nitocote CM210 should not be used on structures subject to high movement, i.e. elevated water retaining tanks. If any doubts arise consult the local Fosroc office.

Storage

Store in unopened bags in cool dry internal conditions. The product has a shelf life of 12 months from the date of manufacture if kept in a dry storage in the original, unopened bags. Material from different batches shall be stored separately.

If stored at high temperatures and/or high humidity conditions the shelf life may be reduced to less than 6 months.

Precautions

Health and safety

For further information refer to appropriate Product Safety Data Sheet.

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Fosroc International Limited
Drayton Manor Business Park
Coleshill Road, Tamworth,
Staffordshire B78 3XN. UK

telephone: +44 (0) 1827 262222
fax: +44 (0) 1827 262444
email: enquiryuk@fosroc.com

www.fosroc.com

FM 610 EMS 61113