

Fosroc Nitocote CM210

Elastomeric cementitious coating.

Uses

Nitocote CM210 is an elastomeric cementitious coating, used for waterproofing water retaining structures and water excluding structures. Nitocote CM210 provides an elastomeric waterproof coating suitable for use in potable water tanks, reservoirs, canals and culverts.

The material which can be used on concrete, brick and block-work substrates exhibits good crack bridging qualities even after long term water immersion. This is a conditions a number of cementitious coatings cannot satisfy. Nitocote CM210 has been developed to readily accommodate the maximum permissible crack widths recommended in BS8007:1987 the British Standard Code of Practice for the design of concrete structures for retaining aqueous liquids.

Advantages

- Approved for use in contact with potable water.
- Withstands high positive and negative hydrostatic pressures
- Excellent crack accommodation after immersion.
- Excellent bond to concrete and masonry.
- Long working life.
- Easy application by brush, roller, trowel or spray.
- Bonds to green or damp concrete.
- Effective barrier to sulphates and chlorides.

Standards compliance

- Nitocote CM210 meets the requirements of BS 6920, WRAS. approved for use in contact with potable water up to 50°C.
- DIN 1048 : Water Penetration Test.
- Fire Tested to BS476 : 1987 Parts 6 and 7.

Description

Nitocote CM210 two-component polymer modified cementitious coating is supplied in pre-packaged form. The product is designed to be easily mixed on site using a slow speed drill fitted with a mixing paddle and then applied to the substrate using either brush, trowel or spray. Roller application may also be used, however, finishing the surface with a trowel is recommended for best results.

Nitocote CM210, available in grey and white, cures to form and elastomeric impermeable membrane

Technical support

Fosroc offers a comprehensive range of high performance, high quality repair, maintenance and construction products. In addition, Fosroc offers a technical support package to speci-

fiers, end users and contractors, as well as on-site technical assistance in locations all over the world.

Properties

Typical properties of mixed material

Pot life at 20°C	: 2 hours
Pot life at 35°C	: 1 hour
Colour	: Grey or white
Mixed density	: 1950 kg/m ³
Minimum application temperature	: 5°C

Properties of cured coating (21 days cure at 23°C, followed by 28 days immersion at 23°C).

The values obtained are for Nitocote CM210 when applied in two coats each of 1 mm dry film thickness

Resistance to positive water pressure (DIN 1048) Pt5	: 5 bar (50m head of water)
Resistance to negative water pressure (ITM/FTM-181)	: 2 bar (20m head of water)
Static crack accommodation	: >0.9 mm

Dynamic crack accommodation capability 0 - 300 - 0 microns cycling after 28 days immersion (University of Surrey method)

15°C	: 6,000 cycles (no failure)
0°C	: 6,000 cycles (no failure)
-12°C	: 6,000 cycles (no failure)

Abrasion resistance (ASTM D4060)	: wear index (equivalent to 40 N conc.)
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Co-diffusion resistance (Taywood method) after 5000 hrs QUV2	: >50m
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Chloride ion diffusion resistance (Taywood method)	: No penetration
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Initial surface absorption	: > 95% reduction against control
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NOTE 1 : Nitocote CM210 will bridge an existing crack of up to 0.5 mm in width.

NOTE 2 : UV test required coating to be exposed to 4 hrs. condensation at 50°C followed by 4 hrs. UV light at 50°C. Total exposure time was 5,000 hours.

Note: The typical physical properties given above are derived from testing in a controlled laboratory environment. Results derived from testing field-applied samples may vary, dependent on actual site conditions.

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Specification clause

The waterproofing coating shall be Nitocote CM210, an elastomeric cementitious coating tested against BS 6920, WRAS approved for use with potable water up to 50°C. The cured coating, after immersion, shall be capable of withstanding cracked substrate cyclic movement from 0 - 300 - 0 microns at 15°C for 6,000 cycles without failure. It shall have the capability to resist a positive water pressure of 5 bar and a negative water pressure of 2 bar when tested to DIN 1048.

Poor quality, friable or contaminated concrete may require grit-blasting.

Application instructions

Instructions for use

Surface preparation

All surfaces which are to receive the coating, must be free from oil, laitance, grease, wax, dirt or any other form of foreign matter which could affect adhesion. Typically, concrete surfaces can be cleaned using a high pressure water jet or grit blasting or wire brushing or mechanical grinding to achieve proper adhesion between the concrete surface and coatings.

Spalled surfaces or those containing large blowholes, and other such defects, should be repaired using Nitocote CM210 or a Fosroc approved repair mortar. Care must be taken when choosing the repair mortar to ensure that it has all necessary approvals for contact with potable water.

If the surface contains small blowholes, typically less than 1 mm wide, the coating can be applied directly onto the substrate without the need for a treatment.

Cracks which are less than 0.3 mm in width can be over-coated as long as the crack is not likely to open up to greater than 0.3 mm (this is greater than the maximum permissible cracks widths recommended in BS8007:1987, the British Standard Code of Practice for the design of concrete structures for retaining aqueous liquids).

Cracks which are greater than 0.3 mm in width should be chased out to 4 mm in width and approximately 15 mm in depth. This should be filled with Nitocote CM210 (applied using a Fosroc 'G' Gun). When the material in the crack has hardened the coating should be applied over the crack

Mixing

The liquid polymer (5 kg) is poured from the plastic container into a plastic or metal drum having a volume of at least 25 litres.

To this, the powder is gradually added (18 kg) whilst mixing with an approved spiral paddle attachment on a slow speed drill. Mixing is continued 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 280 to 640 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 adhered to with particular emphasis on the time of the mixing operation.

Pre-wetting of the substrate

Thoroughly dampen the substrate surface with water using a brush roller or spray bottle. 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 prior to proceeding.

Any excess water should be removed using a sponge. Any running water should be stopped with a suitable plugging mortar such as Renderoc Plug. Contact the local Fosroc office for further advice on other suitable water stopping materials.

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 1 mm (approximate coverage per coat is 1.9 kg/m²). To ensure the correct thickness is achieved measure out an area (for example 200 m²) 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 attempt to fill all imperfections such as blow holes during the application. If not, they can be filled while the coating is still fluid by using a dry sponge. If the coating has dried before these imperfections are found they can be filled using fresh material.

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

Allow the first coat to cure for a minimum of 4 hours at 20°C per 50% RH and longer at lower temperatures or higher humidity's.

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 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 the application of the second coat to remove potential contamination.

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



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Freshly applied coating should be protected from rain and strong wind or until firm to the touch to prevent damage to the wet coating.

Water curing OR Curing membrane shall not be applied over Nitocote CM210 coating, only air curing is recommended

Brush application

The most suitable type of brush is a soft bristled wallpaper paste brush (120 to 220 mm 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 1 mm 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. Example 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 the Nitocote CM210 Application Unit Model E4 (consult separate data sheet and instructions for use) or other recommended unit. This is the preferred method for applications over 150 m².

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, with particular care being taken to ensure that no lumps remain in the mix. The mixing container should be placed on plastic sheeting to prevent contamination in the mix. Material should be scraped from the mixing vessel above the wet line following every mix. The mixing paddle should also be cleaned to remove hardened material which if ingested may cause blockage in the pump.

Pour the material into the hopper. Scrape the sides of the hopper down at regular intervals to prevent hardened material from contaminating 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 spray operator has judged the ideal application speed and distance from the substrate. Any areas less than 1 mm thick should be re-sprayed. Subsequent film thickness measurements should be carried out approximately every 10 m².

Mechanical Key (Vertical & Horizontal application)

Sprinkle sieved coarse sand on wet surface of final coating for better adhesion of plaster or screed.

Allow the coating to dry for a minimum period of 7 days before covering with plaster on the vertical surface & 3 days before covering with screed/plaster on the horizontal surface. Maximum thickness of cement plaster recommended is 12 to 18mm & height of 1m in a single day to avoid de-bonding of plaster from Nitocote CM210 coating. Any deviation from the above recommendation please contact Local Fosroc office for advice.

Sealed joints

Where required joints should be sealed with a suitably approved joint sealant prior to the application of Nitocote CM210. For further details on suitable sealants contact your local Fosroc office.

Apply debonding tape over the sealant. Following the application of Nitocote CM210 remove the tape and overlaying coating.

Mock up

It is advised that a mock up trial is made and signing off with applicator is mandatory to proceed with actual work.

WRAS potable water approvals

In the case of contracts requiring WRAS certification, Nitocote CM210 should be applied in two coats. The product must be allowed to cure for a minimum of 21 days at 23°C or greater.

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Tanks with a surface area less than 250 m² should be flushed with water prior to filling. The tank should be disinfected in accordance with local regulations prior to reconnecting to the public water supply.

Nitocote CM210 should not be used when the temperature is below 5°C and falling. 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 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.

Estimating

Nitocote CM210 Components	15kg pack	5kg pack
Nitocote CM210 powder	11.75kg	3.92kg
Nitocote CM210 liquid	3.25kg	1.08kg

Coverage

Coverage rate at 1mm : 0.5m² per 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 3.6 kg/m² applied in not less than two coats is recommended.



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Important note :

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Storage

Shelf life is 6 months in unopened packs. The liquid component must not be allowed to freeze.

Precautions

Health and safety

Nitocote CM210 powder is irritating to the eyes, respiratory system and skin. Avoid inhalation of dust and wear suitable respiratory protective equipment. Nitocote CM210 liquid is not classified as dangerous. Nitocote CM210 when mixed becomes highly alkaline. Wear suitable protective clothing, gloves and eye protection.

For both components and for the material when mixed avoid contact with eyes or skin rinse immediately with plenty of water and seek medical advice. For further information, please refer to the Product Safety Data Sheet.

Cleaning and disposal

Immediately following application, clean all tools and equipment with clean water. Hardened material can be removed by mechanical means. Waste material should be allowed to harden overnight and then dispose of as nonhazardous.