

Nugrout Flowable Concrete

Free Flowing Cementitious Micro Concrete



Nufins

Description

A cementitious free flowing and self-compacting concrete, based on non-reactive aggregates, low alkali Portland cements with selected admixtures to produce a chloride free concrete which contains no corrosive metallic additives. Nugrout Flowable Concrete is designed for structural repair situations and complies with the requirements of the Department of Transport Standard BD27/86 Clause 4, as well as with the requirements of BS EN1504 Part 3 Class R4.

Advantages

- Has controlled expansion and is non-shrink.
- Excellent early compressive and flexural strength.
- Designed to facilitate cathodic protection.
- Material can be pumped, poured & vibrated.
- Excellent bond strength to steel and concrete.
- Requires only addition of clean water.
- Excellent flow and placement characteristics.
- Resistant to vibration and impact.
- Complies with requirements of EN1504 Part 3 Class R4.

Applications

- Repairs to insitu bridge decks and piers.
- Repairs of reinforced concrete structures.
- Bedding of precast beams.
- Grouting of machinery and turbines etc.
- Highway & Rail network structures.

Technical Information

Water Addition	3.0-3.3 litres per 25kg pack
Cement Content	> 400 kg/m ³
Free Water/Cement Ratio	0.39
Density	2200-2350 kg/m ³
Yield	12.7 Litres
Maximum Aggregate Size	6mm
Typical Expansion	0.3-1.0% at 24hours.
Equivalent Sodium Oxide	<3kg/m ³
Chloride ion Content	<0.05%, by mass of cement.
Electrical Resistivity	13412 ohm/cm.
Min. Application Thickness	50mm

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EN 1504-3 Concrete repair product for structural repair CC Mortar (based on hydraulic cement)	
Compressive strength	Class R4 (>45 MPa)
Chloride ion content	≤0.05 %
Adhesive bond strength	>2.0 MPa
Adhesion after freeze/thaw (50 cycles with salt)	>2.0 MPa
Carbonation resistance	Passes
Elastic modulus	>20 GPa
Reaction to fire	Class A1
Dangerous substances	Complies with 5.4

Typical Compressive Strengths
Tested in accordance with EN 206.

24 Hours	3 Days	7 Days	28 Days
20 MPa	40 MPa	50 MPa	65 MPa

Based on Portland Cement complying with DTp Specification of Highway Works Part 5.

Aggregate is non-reactive for Alkali-Silica Reaction, complying with the requirement of DTp Clause 1704.

Flow (DTp flow trough) flows 750mm in less than 30 seconds, in accordance with BD27/86.

Nugrout Flowable Concrete is non-shrink in accordance with Clause 2601.4(vii), DTp Specification for Highway Work Part 6.

Technical Properties of Nugrout Flowable Concrete.

Properties	Standard	Performance Requirement	Declared Value
Appearance			Grey Powder
Chloride-ion content	EN1015-17	≤0.05%	<0.05%
Maximum aggregate size			6mm
Minimum Layer thickness			50mm
Working time			2 Hours
Hardening Time			6-18 Hours
Density			2200-2350 kg/m ³
Application temperatures			Between +5°C & +35°C
Compressive Strength	EN 12190	≥ 45 MPa	20 MPa @ 24 Hr 40 MPa @ 3 Days 50 MPa @ 7 Days 65 MPa @ 28 Days
Tensile Strength	BS6319-7		>4.0 MPa
Modulus of Elasticity, In Compression	EN13412	≥ 20 GPa	>20 GPa
Adhesion - concrete	EN1542	≥ 2.0 MPa	≥ 2.0 MPa
Adhesion after freeze/thaw (50 cycles with salt)	EN13687-1	≥ 2.0 MPa	≥ 2.0 MPa
Adhesion after thunder showers (30 cycles)	EN13687-2	≥ 2.0 MPa	≥ 2.0 MPa
Adhesion after dry cycling (30 cycles)	EN13687-4	≥ 2.0 MPa	≥ 2.0 MPa
Skid Resistance	EN13036-4		Class 1
Carbonation resistance	EN13295	$d_k \leq \text{ref. concrete}$	$d_k < \text{ref. concrete}$
Capillary absorption	EN13057	$\leq 0.5 \text{ kg/m}^2/\text{h}^{-0.5}$	$\leq 0.5 \text{ kg/m}^2/\text{h}^{-0.5}$
Cracking tendency	Coutinho Ring Test		No cracking after 180 days
Electrical Resistivity			13412 ohm/cm

Note: Results are based on 3.3 litres water addition, cured at 20°C. Unless otherwise stated. Technical data shown are statistical results and do not correspond to guaranteed minima. Tolerances are those described in appropriate performance standards.

1 N/mm² = 1 MPa

1 kN/mm² = 1 GPa



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Surface Preparation

Surfaces should be clean and free from loose and unsound material. Oil and grease should be removed using *Desolve*. Surfaces should be thoroughly wetted for a minimum of two hours and any surplus water removed before placement. To achieve a saturated, surface dry condition.

Mixing

Mixing may be carried out in a standard barrel mixer or forced action mixer of a size suitable to produce the quantity of material required and without leaving any residual unmixed material. The mixing of part bags is not recommended.

The mixer drum is to be clean and free from the remains of the previous mixes. Thoroughly wet the inside of the mixer drum and drain off any excess water.

Measure out the mixing water and place approximately two thirds of this into the mixer drum. With the mixer rotating, add the full contents of the pack and allow to mix till a stiff consistency is obtained. This is necessary to eliminate any unmixed material. Add all or part of the remainder of the water to achieve the desired consistency and allow to mix for a further 1-4 minutes, depending upon mixer. Pour the mix into containers and allow to de-air for 3-5 minutes.

This will not be necessary if pumping. Use mix as required.

Pouring Nugrout Flowable Concrete

Nugrout Flowable Concrete should be placed by pouring, remembering flowability decreases with time. Always mix enough material to complete placing in one uninterrupted pour.

Place the product from one side only, so as to avoid entrapped air and to ensure continual free flow of the material.

Where formwork is involved it is essential that it is thoroughly sealed to prevent concrete loss and it should be coated with *Chemlease* to obtain an easier release.

Pumping Nugrout Flowable Concrete

The addition of excess water to "aid flowability" should be avoided as this could cause segregation of the mix and inhibit pumping. To aid pumping, the water addition may be reduced slightly by an experienced operator. Please contact Nufins technical department for further information regarding specific applications.

Low Temperature Working

Concreting should not take place in temperatures below 5°C unless steps have been taken to protect grouted areas in these conditions. At temperatures below 10°C it is advised Nugrout Flowable Concrete is stored at 15-20°C for a minimum of 24 hours and that the mixing water should be warm, 20-25°C.

Curing

The placed concrete must be cured using good concreting practise. Several methods may be employed including the application of Nufins *Chemcure R90*.

Packaging

Nugrout Flowable Concrete is supplied in a 25kg lined bag. Approximate yield is 12.7 litres.

Storage

Store in cool dry conditions.

Health & Safety

Nugrout Flowable Concrete does not present any undue hazard and is non-toxic, however as with all cementitious materials it is slightly alkaline. Therefore gloves and goggles should be worn and any material should be washed using clean water from the skin and eyes before it dries.

Limitations

Excessive water additions will reduce strengths and can cause segregation within the mix which may limit the flow.

Technical Support

Through our technical department and laboratories we can offer a comprehensive service to specifiers and contractors. Technical representatives are available to provide further information and arrange demonstrations.



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