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CONSTRUCTION ACCESSORIES

NUGROUT FLOWABLE CONCRETE DATASHEET

ESSENTIAL COMPONENTS FOR EVERY STAGE OF CONSTRUCTION

Technical Datasheet

Nugrout Flowable Concrete

Free Flowing Cementitious Micro Concrete

Description

A cementitious high 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 deep section structural repair and anchoring situations and complies with the requirements of highways standard BD27/86 Clause 4 as well as BS EN1504 Part 3 Class R4.

Advantages

- Has controlled expansion & is non-shrink
- Excellent early compressive & flexural strengths
- Designed to facilitate cathodic protection works
- Material can be pumped, poured & vibrated
- Excellent flow & placement characteristics
- Suitable for deep section use up to 500mm
- Excellent bond strength to steel & concrete
- Resistant to vibration & impact
- Complies with requirements of EN 1504 Part 3 Class R4

Applications

- Structural repairs to insitu bridge decks & piers
- New motorway & rail network structure construction
- Water treatment works, coastal & marine environments
- Repairs of reinforced concrete structures
- Grouting of machinery & turbines etc.

Technical Information

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 750 mm 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

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0086-CPD-594215

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
Elastic modulus	>20 GPa
Reaction to fire	Class A1
Dangerous substances	Complies with 5.4

Water addition	3.0-3.3 litres per 25 kg pack
Density	2200-2350 kg/m^3
Maximum aggregate size	6 mm
Min. grout entry or slot width	50 mm

Surface Preparation in General

Surfaces should be clean and free from loose, unsound material and dust. Oil, grease and other contaminants should be removed. A saturated, surface dry condition is required before applying Nugrout Flowable Concrete. To achieve this, surfaces should be thoroughly saturated with clean water for a minimum period of 2 hours and any surplus water removed before placement.

Technical Datasheet

Technical properties of Nugrout Flowable Concrete

Properties	Standard	Performance Requirement	Declared Value
Appearance			Grey Powder
Chloride-ion content	EN 1015-17	≤0.05 %	<0.05 %
Maximum aggregate size			6 mm
Cement content			>400 kg/m^3
Free water/cement ratio			0.39
Minimum layer thickness			20 mm
Working time			2 hours
Hardening time			6-18 hours
Density			2200-2350 kg/m^3
Application temperatures			5-35°C
Compressive strength @ 20°C	EN 12190	≥45 MPa	20 MPa @ 24 hours 40 MPa @ 3 days 50 MPa @ 7 days 65 MPa @ 28 days
Tensile strength	BS 6319-7		>4.0 MPa
Modulus of elasticity, In compression	EN 13412	≥20 GPa	>20 GPa
Adhesion - concrete	EN 1542	≥2.0 MPa	≥2.0 MPa
Adhesion after freeze/thaw (50 cycles with salt)	EN 13687-1	≥2.0 MPa	≥2.0 MPa
Adhesion after thunder showers (30 cycles)	EN 13687-2	≥2.0 MPa	≥2.0 MPa
Adhesion after dry cycling (30 cycles)	EN 13687-4	≥2.0 MPa	≥2.0 MPa
Skid resistance	EN 13036-4		Class 1
Carbonation resistance	EN 13295	d_k ≤ ref. concrete	d_k < ref. concrete
Capillary absorption	EN 13057	≤0.5 kg/m^2.h$^{0.5}$	≤0.5 kg/m^2.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/mm^2 = 1 MPa

1 kN/mm^2 = 1 GPa

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Surface Preparation for Concrete Repair

Preparation shall leave clean, sound exposed surfaces, free from all contamination, oil, grease, dirt, loose particles, debris and dust.

Saw-cut the perimeter of damaged or spalled areas, forming good shoulders and break out defective concrete to the required depth, using mechanical equipment or high pressure water-jet to expose sound concrete.

Remove damaged concrete and where spalling has been caused by corrosion, the reinforcement must be exposed. Reinforcement should be cleaned beyond its corrosion length and around its full circumference, enabling mortar to be compacted behind it. All rust and scale should be removed from any exposed steel preferably by grit-blasting. If reinforcement has corroded, reducing bar diameter and volume, consideration should be given to replacement.

Surfaces should be thoroughly saturated with clean water for a minimum period of 2 hours and any surplus water removed before placement.

Mixing

Part mixing of bags is not recommended. The mixer should be of a type that will thoroughly blend the material and water, without leaving residual unmixed material or cause 'balling'. Mixing may be undertaken with a forced action mixer or pan type paddle mixer, the size of which should be suitable for the quantity to be prepared for use at any one time. The use of an appropriate high torque slow speed drill and paddle may be considered for mixing, as an alternative, taking care not to entrain excess air.

Nugrout Flowable Concrete requires mixing with clean water only. No other additives are required. The mixer drum should be clean and free from the remains of previous mixes.

1. Thoroughly wet out the mixer drum & discard excess water.
2. Measure out the mixing water; 3 - 3.3 litres per 25kg bag, the volume relevant to intended use.
3. Place two thirds of the required water into the drum.
4. With the drum rotating, add the full contents of the bag and allow to mix for one minute.
5. Add all or part of the remainder of the water and allow to mix for up to a further 4 minutes (depending on the type of mixer used), till a lump-free, homogenous mix is achieved.
6. Pour the mixed grout into a suitable container and allow to de-aerate for 3 - 5 minutes. Agitate before pouring in case of settlement.

Application Instructions

Nugrout Flowable Concrete should be placed by poured or pumped application, remembering that flow decreases with increases of temperature and time. Always mix sufficient of the material to complete placing in one uninterrupted pour to achieve a monolithic body of material.

Place the product from one side only to avoid air inclusions and to ensure a continuous free flow of the grout.

For Pumped Application, we recommend a Putzmeister P11 worm-drive or similar with 70mm hose. Excess water addition is not advised as this can cause segregation of the mix and inhibit pumping. Calibration of water addition can be undertaken on site. Please contact Nufins technical department for advice.

Where formwork is involved, it is essential that all gaps are well sealed to prevent grout loss. Formwork should also be coated with *Chemlease* to obtain an easier strike.

Cleaning

Mixing equipment and tools should be cleaned regularly through the day to avoid product build up, using clean water.

Curing

Curing should be employed immediately after finishing, as work progresses. Nugrout Flowable Concrete should be protected from rapid drying out, using normal methods of curing such as taped down polythene sheeting, and wet hessian if required, in line with good concreting practise. A UV degradable resin based curing membrane such as *Chemcure R90* may be used, but this must be fully removed by mechanical equipment if the surface is going to receive subsequent treatments.

Packaging

Nugrout Flowable Concrete is available in 25kg polythene lined bags (yield approximate 12.7 litres).

Storage

The shelf life is 6 months when stored unopened in dry, normal conditions and away from direct sunlight. Protect from frost.

Technical Support

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

Health & Safety

Product Safety Data Sheets (SDS) are available from Nufins. SDS sheets are provided to help customers satisfy their safe handling, use and disposal needs as well as assist with any conformance requirements made locally by health and safety regulations.

SDS are continually updated to provide the latest information to our customers. We therefore recommend contacting our head office to obtain the most recent and accurate SDS before handling and using any product.

Limitations

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

Grouting operations should not proceed in temperatures of 5°C or below, unless steps are taken to protect material and adjacent areas. It is recommended that materials are stored above 10°C and mixing water is warmed at 10-20°C.

In addition, materials should not be installed in temperatures of 3°C or below on a falling scale, without all frost protection measures. Protect installed material from adverse weather and frost. If it is necessary, the work area should be tented and heated during and after placement. Contact Nufins technical department for further advice.

Disclaimer

The information contained herein is to the best of our knowledge true and accurate and is given in good faith but without warranty. The user will be deemed to have satisfied themselves independently as to the suitability of our products for their own particular purpose. In no event shall Nufins be liable for consequential or incidental damages.

Users must always refer to the most recent issue of the Technical Datasheets, copies of which will be supplied on request.

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