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Nugrout Hi-Spec

Free Flowing Cementitious Grout

Nufins

Description

A high strength free flowing cementitious grout based on non-reactive aggregates, shrinkage compensated Portland cements and selected admixtures which produce a chloride free grout. Nugrout Hi-Spec contains a maximum nominal size aggregate of 2mm and is suitable for grouting thicknesses over 5mm. Nugrout Hi-Spec has been formulated to comply with the requirements of EN1504 Part 3 Class R4. In addition it also conforms with the requirements of the Department of Transport Specification for Highway Works Clause 2601 Part 4.

Advantages

- Non-shrink through controlled expansion.
- Very high early compressive and flexural strengths.
- Resistant to vibration and impact.
- Material can be pumped, poured, vibrated or rodded.
- Excellent bond strength to reinforcement steel and concrete.
- Contains no corrosive metallic additives.
- Tolerant to freeze/thaw cycles.
- Excellent flowability and placement characteristics.

Applications

- Repair to spalled and damaged concrete structures
- Production of bridge bearing plinths.
- Crane rail bedding and alignment.
- Grouting of starter bars, holding down bolts, etc.
- Bedding of pre-cast concrete beams.
- Grouting of machinery and turbines etc.

Technical Information

Tested in accordance with EN12190.
Typical compressive strengths of 100mm cubes.

Compressive Strength	
24 Hour	34 MPa
3 Days	50 MPa
28 Days	75 MPa
Typical Density	2150-2300 kg/m^3
Cement Content	>400 kg/m^3
Water/Cement Ratio (4.0 Ltr water per 25kg bag)	0.40
Water Addition (Per 25kg pack)	2.75-4.0 Litres

Note: Strengths based on 4 Litre water addition.

Application Thickness: 5mm to 100mm.
For application thicknesses above 75mm please refer to technical department.

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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

DTp Specification clause 2601 part 4.

Expansion (ASTM C827-01)	0.25-2.5%
Flow Trough	<30 seconds to reach 450mm
Efflux test/Flow Cone (ASTM C939-02)	20-45 Seconds
Elastic Stability	< 1.0%
Flow Under Glass Plate	Passed
Compressive Strength (EN12390)	> 50 MPa

Technical properties of Nugrout Hi-Spec.

Properties	Standard	Performance Requirement	Declared Value
Appearance			Grey Powder
Chloride-ion content	EN1015-17	≤0.05%	<0.05%
Maximum aggregate size			2mm
Layer thickness Minimum/maximum			5mm-100mm*
Working time (@ 20°C)			45-60 Minutes
Hardening Time (@ 20°C)			4-18 Hours
Density			2150-2300 kg/m^3
Temperature for application			Between +5°C & +35°C
Compressive Strength @ 20°C	EN 12190	≥ 45 MPa	34 MPa @ 24 Hr 50 MPa @ 3 Days 60 MPa @ 7 Days 75 MPa @ 28 Days
Tensile Strength	BS6319-7		>4.0 MPa
Flexural Strength	BS6319-3		>7 MPa
Modulus of Elasticity, In Flexure	BS6319-3		>20 GPa
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 ≤ ref. concrete	d_k < ref. concrete
Capillary absorption	EN13057	≤ 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

* For applications greater than 75mm please refer to technical department
Note: Strengths are based on 4.0 litres water addition.
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

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 period of 2 hours and any surplus water removed before placement. Allow to become surface dry thus obtaining a saturated, surface dry condition.

Mixing

Mixing may be carried out in a forced action or pan type paddle mixer of a size suitable for the quantity to be prepared for use at one time. The part mixing of bags of material is not recommended. The mixer should be of a type that will thoroughly mix the material and water without leaving residual unmixed material, or cause 'balling'.

The contents of each bag of Nugrout Hi-Spec requires mixing with clean water only. No other ingredients are required. The mixer drum is to be clean and free from the remains of previous mixes. Thoroughly wet the inside of mixer drum and drain off excess water. Measure out the mixing water, 2.75-4.0 Litres per 25kg. Place two thirds of the mixing water into the drum. With the mixer rotating add the full contents of the bag and allow to mix for one minute. 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. Pour mix into a container and allow to de-air for 2-3 minutes. Use as required.

Nugrout Hi-Spec may be mixed into a mortar-like consistence. Careful control of the water addition is critical. The addition rate is 2.0- 2.4 Litres per 25kg bag.

Application Instructions

Nugrout Hi-Spec should be placed by pouring or pumping, remembering that flow decreases with temperature and time. Always mix sufficient material to complete placing in one uninterrupted pour.

Place the product from one side only so as to avoid air inclusions and ensuring continuous free flow of the grout.

When pumping, the addition of excess water is not advised as this could cause segregation of the mix and inhibit pumping.

Where formwork is involved it is essential that it is well sealed to prevent grout loss and coated with Chemlease to obtain an easier strip.

Low Temperature Working

Grouting should not take place in temperatures below 5^{o}C unless steps have been taken to protect grouted areas in these conditions. At temperatures of 10^{o}C and below Nugrout Hi-Spec should be maintained in a dry store at 15-20^{o}C for a minimum of 24 hours and the mixing water should be between 20-25^{o}C.

Curing

The placed material must be cured immediately after finishing using good concrete practice. The preferred method is to apply Nufins curing compounds directly onto the grouted area. These products are designed to maximise performance of the Nugrout Hi-Spec. If this is not possible then the grout should be protected with polythene sheeting which is taped down to form a draught proof area.

Packaging

Nugrout Hi-Spec is supplied in 25kg polythene lined sacks, approximate yield is 13 litres.

Storage

Store in cool dry conditions.

Health & Safety

Nugrout Hi-Spec does not present any undue hazard and is non-toxic. As with all cementitious materials it is slightly alkaline, therefore gloves and goggles should be worn and any material should be washed from the skin and eyes with clean water 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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