



Nucem Concrete

Polymer Modified Cementitious Concrete



Nufins

Description


Nucem Concrete is a prepacked shrinkage compensated, polymer modified cement based concrete, supplied with either an acrylic or SBR latex polymer. Nucem Concrete is formulated to comply with the requirements of EN1504 Part 3 Class R4 as well as conforming to the DTp Model Specification for the 'Repair of Concrete Highway Structures' BD 27/86 Clause 6. It is based on Portland Cements complying with Clause 1702, DTp Specification for Highway Works and non reactive aggregates. Nucem Concrete is specially designed for the restoration of spalled and damaged concrete caused by reinforcement corrosion or frost attack.

Advantages

- Pack contains all constituents including gauging liquid.
- Conforms to EN1504 Part 3 Class R4.
- Guaranteed low water/cement ratio.
- Excellent adhesion to dense concrete and steel.
- Contains no added chlorides.
- Non-reactive aggregates in accordance with DTp Specification for Highway Works Clause 1704.6.
- Excellent workability and finishing properties.
- Good resistance to water, frost & salt penetration.
- Controlled Sodium Oxide to less than 3 kg/m³.
- Manufactured under BSI QA Scheme, ISO 9001, EN1504.
- Suitable for next day waterproofing.

Applications

- Repair of damaged concrete both insitu and precast.
- Repair of damaged floors, bridge decks and road wearing surfaces.
- Screeding where abrasion and/or water resistance is required.
- Repairs to spalled columns and beams using formwork.

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EN 1504-3 Concrete repair product for structural repair PCC Mortar (based on polymer modified 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

Cement content	>400 kg/m ³
Water/cement ratio	0.38
Maximum aggregate size	6 mm
Typical 28 day compressive strength	62 MPa
Non-reactive aggregates with regard to Alkali-silica reaction, complying with the requirements of DTp Clause 1704.	

Technical properties of Nucem Concrete.

Properties	Standard	Performance Requirement	Declared Value
Appearance			Grey Powder & White Liquid
Chloride-ion content	EN1015-17	$\leq 0.05\%$	$\leq 0.05\%$
Maximum aggregate size			6mm
Water/cement ratio			0.38
Cement content			$\geq 400 \text{ kg/m}^3$
Layer thickness-minimum			20mm
Density			2300 kg/m^3
Working time			30-45 Minutes
Temperature for application			5°C to 30°C
Compressive strength @ 20°C	EN 12190	$\geq 45 \text{ MPa}$	1 Day @ 20 MPa 7 Day @ 50 MPa 28 Days @ >60 MPa
Modulus of elasticity, In compression	EN13412	$\geq 20 \text{ GPa}$	26 GPa
Flexural strength	BS6319-3		10 Mpa
Modulus of elasticity, in flexure	BS6319-3		26 GPa
Adhesion - concrete	EN1542	$\geq 2.0 \text{ MPa}$	$\geq 2.0 \text{ MPa}$
Adhesion after freeze/thaw (50 cycles with salt)	EN13687-1	$\geq 2.0 \text{ MPa}$	$\geq 2.0 \text{ MPa}$
Adhesion after thunder showers (30 cycles)	EN13687-2	$\geq 2.0 \text{ MPa}$	$\geq 2.0 \text{ MPa}$
Adhesion after dry cycling (30 cycles)	EN13687-4	$\geq 2.0 \text{ MPa}$	$\geq 2.0 \text{ MPa}$
Skid resistance	EN13036-4		Class 1
Carbonation resistance	EN13295	$d_k \leq \text{ref. concrete}$	Passes
Capillary absorption	EN13057	$\leq 0.5 \text{ kg/m}^2/\text{Hr}^{0.5}$	$\leq 0.5 \text{ kg/m}^2/\text{Hr}^{0.5}$
Cracking tendency	Coutinho ring test		No cracking after 180 days

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

The substrate must be clean and sound, hence all grease, oil, dust and laitance must be removed by scarifying. The edges of the repair must be recessed at least 20mm. Where spalling is caused by reinforcement corrosion, all steel must be exposed and cleaned to remove all loose scale and rust, preferably by grit blasting.

Priming

Nucem Primer is prepared by adding the contents of the base to the hardener container and mixing thoroughly. Usable life 2 - 3 hours.

The prepared surface and cleaned reinforcement steel should be coated with the Nucem Primer using a stiff brush ensuring it is thoroughly worked into the surface. Nucem Primer can be sprayed using specialist equipment.

When using Nucem Primer it is not normally necessary to pre-saturate the substrate as it may be applied to either dry or damp surfaces. However, when applying a section of less than 20mm thick and the substrate has dried over a substantial period, it is advisable to pre-dampen the surface before priming.

Whilst the primer is still tacky, normally within 3 hours, apply Nucem Concrete. If the primer dries before the application of the Nucem Concrete then the area should be re-primed.

Coverage of Nucem Primer is 3 - 5 m² per 1.0 kg pack.

Mixing

Mix as for normal concrete ensuring that the materials are thoroughly mixed before use. The use of a forced action pan mixer will ensure thorough mixing. Wet the bowl and drain. Add two thirds of the gauging liquid to the mixer then all the powder component and mix for 30-60 seconds. Add all or part of the remaining gauging liquid to bring to the required consistency.

Do not over mix.

Application Instructions

Apply mixed Nucem Concrete to the substrate previously primed with Nucem Primer while the primer is still tacky. Compact the Nucem Concrete to ensure maximum durability and finish as for normal concrete.

All equipment should be cleaned immediately after use by washing with water.

Curing

Normal curing procedures should be applied immediately after finishing and precautions taken to avoid frost attack. UV degradable resin based curing membranes should not be used if the concrete is to receive a subsequent surface coating.

Over coating

After a suitable curing period the Nucem Concrete may be over coated with decorative coatings or a waterproof membrane.

Storage

Material must be stored unopened in dry, frost free conditions. The shelf life of Nucem Concrete is 6 months.

Health & Safety

Nucem Concrete does not present any undue hazard and is non-toxic, however, as it is alkaline, gloves should be worn and any material should be washed from the skin and eyes before it dries with clean water.

The normal standards of hygiene should be observed and the use of a barrier cream is advisable.

Nucem Primer, like similar products, is capable of irritating unprotected skin. We therefore recommend the use of gloves and barrier cream. Accidental skin contact should be removed using soap and water.

Limitations

The minimum application thickness should be 20mm. Application should not be carried out when the temperature is below 5°C.

Packaging

Nucem Concrete:	27.5 kg units (yield 12.0 litres)
Nucem Primer:	1.0 kg units (coverage 3 - 5 m ²) and 0.5 kg units (coverage 1.5 - 2.5 m ²).

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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