


Emaco[®] NanoCrete R3

Lightweight, polymer modified, fibre reinforced, structural repair mortar

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BASF Construction Chemicals Belgium NV Nijverheidsweg 89, B-3945 Ham	
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0749 - CPD BC2-563-0013-0002-001	
EN 1504-3 Concrete repair product for structural repair PCC mortar (based on hydraulic cement, polymer modified)	
Compressive strength	class R3
Chloride ion content	≤ 0,05 %
Adhesive bond	≥ 1,5 MPa
Restrained shrinkage	≥ 1,5 MPa
Carbonation resistance	passes
Elastic modulus	≥ 15 GPa
Thermal compatibility	
- Freeze-Thaw	≥ 1,5 MPa
- Thunder Shower	≥ 1,5 MPa
- Dry cycling	≥ 1,5 MPa
Capillary absorption	≤ 0,5 kg m ⁻² h ^{0,5}
Reaction to fire (MPA Dresden)	A1
Dangerous substances	complies with 5.4



Certificate number BB-563-0013-0005-001
 Certification Institute BCCA



Description

EMACO NANOCRETE R3 is a single component, lightweight, polymer modified, high build structural repair mortar.

EMACO NANOCRETE R3 is a ready-to-use material that contains sulphate resistant Portland cement (HSR LA), hydraulic binders, well graded sands, specially selected polymer fibres (polyacrylonitril) and additives. Applied nanotechnology has been used to significantly reduce shrinkage.

EMACO NANOCRETE R3 has been specifically formulated to produce a mortar with the compressive

strength and modulus characteristics defined in class R3 of EN 1504 part 3.

When mixed with water, it forms a highly thixotropic mortar that can easily be hand, trowel or spray applied in thicknesses up to 75 mm in one layer. It is particularly suited to vertical and overhead work where hand-profiling is required.

Field of application

EMACO NANOCRETE R3 is used for the structural repair of lower strength concrete elements such as:

- Balcony edges, soffits and decks
- Multi-storey car parks
- Window ledges, lintels and beams commercial or domestic buildings
- Building facades
- Precast panels
- Cantilevers

Coverage / Yield

One 20 kg bag EMACO NANOCRETE R3 will yield approximately 11,5 litres of mortar when mixed with 4,4 litres of water.

Consumption: 1,82 kg of mixed product per m² and mm layer thickness (approx. 1,5 kg of dry powder per m² and mm layer thickness).

This consumption is theoretical and depends on the roughness of the support, for which reason it should be adjusted in each particular job by means of "in situ" tests.

Packaging, storage and shelf life

EMACO NANOCRETE R3 is packaged in 20 kg moisture-resistant bags.

Store EMACO NANOCRETE R3 in cool and dry warehouse conditions at temperatures between 15°C and 25°C. Protect the product against frost.

Shelf life in these conditions is 12 months in unopened original bags.

Benefits

- Formulated with new nanotechnology and shrinkage compensation systems to minimise crack tendency.
- Medium strengths (lower than EMACO NANOCRETE R4) and lower modulus of elasticity allow the repair of medium strength concrete without problems of differential movement.
- Excellent adhesion to concrete.
- Highly thixotropic and lightweight allows high build in a single layer.
- Outstanding workability - EMACO NANOCRETE R3 can be applied up to 75 mm in horizontal or vertical applications, or even 50 mm overhead.
- Easy to create profiles and corners without formwork.
- Very low shrinkage and excellent crack resistance.
- Durable and weather resistant.
- Good water and chloride impermeability.
- Low chromate (Cr[VI] < 2 ppm).
- Chloride-free.

Application instructions

1. Surface preparation: concrete

Concrete must be fully cured, clean and sound to ensure good adhesion. All loose traces of concrete or mortar, dust, grease oil, etc. must be removed.

Concrete must have a minimum direct tensile strength of 1,0 N/mm².

Damaged or contaminated concrete should be removed to obtain a keyed surface. Non-impact/vibrating cleaning methods, e.g. grit or high water pressure blasting are recommended. Aggregate should be clearly visible on the surface of the concrete structure after surface preparation.

Cut the edges of the repair vertically to a minimum depth of 5 mm.

2. Surface preparation: reinforcing steel

If reinforcing steel is visible, clean to a minimum grade of Sa 2 according to ISO 8501-1 / ISO 12944-4 by means of grit-, sandblasting and high water pressure blasting.

Only in case of chloride contamination of the concrete, or when depth of cover is less than 5 mm or when the steel is left exposed before the repair work is completed, should the reinforcement be protected by using EMACO NANOCRETE AP (see *technical data sheet*).

3. Priming

The prepared substrate should be pre-soaked, preferably for 24 hours, but at least 2 hours before applying EMACO

NANOCRETE R3. The surface must be mat-damp, but without standing water.

For improved adhesion of the mortar we advise to apply a bonding layer, especially for hand applications.

- Mix EMACO NANOCRETE R3 to a brushable slurry consistency, and apply onto the pre-dampened surface using the EMACO NANOCRETE brush.
- Alternatively, EMACO NANOCRETE AP can also be applied as the bonding slurry.

Apply EMACO NANOCRETE R3 wet on wet on the bonding layer.

4. Mixing

Open the bags EMACO NANOCRETE R3 a short time before the mixing is started. Damaged or opened sacks should not be used.

Pour the minimum amount of mixing water into a pure vessel.

Mixing water needed: 4.2 to 4.6 litres per 20 kg bag depending upon consistency required. Add the EMACO NANOCRETE R3 powder rapidly and continuously and mix EMACO NANOCRETE R3 with a suitable paddle attached to a powerful, slow speed electric drill (max. 400 tr/min.) for 3 minutes until a lump-free, plastic consistency is achieved. Only use clean uncontaminated water.

Use stiffer consistency for hand and overhead applications.

Allow the mortar to rest for 2 - 3 minutes and then remix briefly, adjusting the consistency as required.

Note: Add water if necessary but never exceed the maximum water demand.

5. Mortar application

For optimum curing of the product the temperatures during application of EMACO NANOCRETE R3 are between +5°C and +30°C.

EMACO NANOCRETE R3 can be hand applied using a screeding beam, trowel or wooden board, or can be spray applied to the desired thickness of 5 to max. 75 mm. Apply the mixed EMACO NANOCRETE R3 directly to the prepared damp substrate, or wet in wet onto the primed surface.

A thin scrape coat or contact layer before building up to the required thickness, wet on wet, will improve the wet adhesion and cohesion of the mortar, especially in case of hand application.

Smoothing with a trowel or finishing by float or sponge can be done as soon as the mortar has begun to stiffen.

Consult your BASF-CC specialist for more information.

At lower temperatures and/or higher humidity these times will be extended.

Initial and final setting, and workability

Temp. °C	Initial setting (hours)	Final setting (hours)	Workability (min)
20	2,5 to 4	4 to 6	45 to 60

Curing

The following curing methods are advised:

- polyethylene film
- damp clothes
- Masterkure curing agents

Contact your BASF-CC specialist for more information.

Cleaning of tools

While still wet clean with water. Once dry/cured the material can only be removed mechanically.

Watch points

- Do not apply EMACO NANOCRETE R3 at temperatures below +5°C nor above +30°C.
- Do not add cement, sand or other substances that could affect the properties of EMACO NANOCRETE R3.
- Never add water or fresh mortar to a mortar mix which has already begun to set.

Health and safety

As with other products containing Portland cement, the cementitious material in EMACO NANOCRETE R3 may cause irritation. Avoid contact with eyes and prolonged contact with skin. In case of contact with eyes, immediately flush with plenty of water for at least 15 minutes. Call a physician. In case of contact with skin, wash skin thoroughly. Keep product out of reach of children.

Consult the Material Safety Data Sheet for further information regarding this product.

Technical properties of EMACO NANOCRETE R3

Properties	Standard	Unit	Standard EN 1504-3	Measured value (min. once a year or extern)	Declared value
Appearance	-	-	-	-	grey powder
Chloride-ion content	EN 1015-17	%	≤ 0,05	-	0,02
Grain size	-	mm	-	-	max. 1,4
Layer thickness	minimum maximum	mm mm	- -	-	5 (horizontal) 75 (vertical) min. 5 – max. 50 (overhead)
Density	-	g/cm ³	-	-	approx. 1,82
Mixing water per bag of 20 kg	-	litre	-	-	approx. 4,2 – 4,6
Working time	-	minutes	-	-	45- 60
Temperature for application (support and material)	-	°C	-	-	between +5 and +30
Compressive strength after 1 day	EN 12190	N/mm ²	-	-	approx. 18
Compressive strength after 28 days	-	N/mm ²	≥ 25	-	≥ 35
E-modulus (28 days)	EN 13412	N/mm ²	≥ 15.000	± 18.000-21.000	-
Adhesion (28 days) concrete	EN 1542	N/mm ²	≥ 1,5	-	≥ 2,7
Adhesion after freeze/thaw (50 cycles with salt)	EN 13687-1	N/mm ²	≥ 1,5	2,6	-
Adhesion after thunder/shower (50 cycles)	EN 13687-2	N/mm ²	≥ 1,5	2,8	-
Adhesion after dry cycling (50 cycles)	EN 13687-4	N/mm ²	≥ 1,5	2,8	-
Carbonation resistance	EN 13295	mm	d _k ≤ ref. concrete	≤ ref. concrete	-
Capillary absorption	EN 13057	kg/m ² /h ^{-0.5}	≤ 0,5	0,22	-
Cracking tendency (I)	Coutinho ring	-	-	-	No cracking after 180 days
Cracking tendency (II)	DIN type V-channel	-	-	-	No cracking after 180 days

Hardening times are measured at 21°C ± 2°C and 60% ± 10% relative humidity. Higher temperatures will reduce these times and lower temperatures will extend them. Technical data shown are statistical results and do not correspond to guaranteed minima. Tolerances are those described in appropriate performance standards

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