

EMACO[®] Nanocrete R3

Lightweight, polymer modified, fibre reinforced, structural repair mortar


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 portland cement, well graded sands, specially selected polymer fibres 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.

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BASF Construction Chemicals Belgium NV Nijverheidsweg 89, B3945 Ham 06 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-Taw	≥ 1,5 MPa
- Thunder Shower	≥ 1,5 MPa
- Dry cycling	≥ 1,5 MPa
Capillary absorption	≤ 0,5kg m ² h ^{-0,5}
Reaction to fire	E
Dangerous substances	complies with 5.4



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

or, anywhere where concrete structures need to be repaired or reprofiled by hand.

Emaco[®] Nanocrete R3 can be applied inside and outside, on horizontal, vertical and overhead surfaces, in dry and wet environments.

Technical Data

Property	Standard	Unit	Values
Appearance	-		Grey Powder
Grain size	-	mm	Max. 1.2
Layer thickness: Minimum	-	mm	5
: Maximum		mm	75
Density	-	g/cm ³	approx. 1.8
Mixing water per 20kg sack	-	litre	approx. 4.2 to 4.6
Working time	-	minutes	45 - 60
Temperature for application (support and material)	-	°C	Between +5 and +30
Compressive strength	EN 12190	N/mm ²	
- after 1 day			≥ 12
- after 7 days			≥ 25
- after 28 days			≥ 35
E-Modulus (28 days)	prEN13412	GPa	≥ 15
Adhesion (28 days)	EN 1542	N/mm ²	≥ 1.5
Adhesion after Freeze/Thaw (50 cycles with salt)	EN 13687-1	N/mm ²	≥ 1.5
Adhesion after Thunder/Shower (50 cycles)	EN 13687-2	N/mm ²	≥ 1.5
Adhesion after Dry cycling (50 cycles)	EN 13687-4	N/mm ²	≥ 1.5
Carbonation resistance	prEN 13295	Observed depth in mm	≤ reference concrete
Capillary absorption	EN 13057	Kg/m ² h ^{0.5}	≤ 0.5
Cracking tendency (I)	Coutinho type 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.

Benefits

- Formulated with new nanotechnology and shrinkage compensation systems to minimise crack tendency
- Medium strengths 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 - 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 guidelines

(a) Surface preparation: Concrete.

Concrete must be fully cured with a minimum direct tensile strength of 1.0 N/mm². All surfaces must be clean and sound to ensure good adhesion. All loose traces of concrete or mortar, dust, grease oil, etc. must be removed.

Damaged or contaminated concrete should be removed to obtain a keyed surface. Aggregate should be clearly visible on the surface of the concrete structure after preparation.

Non-impact/vibrating cleaning methods, e.g. grit or high water pressure blasting are recommended. Cut the edges of the repair vertically to a minimum depth of 5 mm.

(b) Surface preparation: Reinforcing steel

Clean all exposed reinforcement to a minimum grade of Sa 2 according to ISO 8501-1 / ISO 12944-4.

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*).

(c) Priming Concrete:

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.

Bonding slurries can improve the adhesion of the mortar, especially for hand applications:

- Mix Emaco[®] Nanocrete R3 to a stiff 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 on the primed surface wet on wet. Do not allow the bonding layer to dry out completely.

(d) Mixing:

It is strongly recommended that only full sacks are mixed. Damaged or opened sacks should not be used.

Mix Emaco[®] Nanocrete R3 with clean water only, in a forced action pan mixer, or with a suitable paddle attached to a powerful slow speed electric drill for 3 minutes until the required lump-free, plastic consistency is achieved.

Mixing water needed: 4.4 to 4.8 litres per 20kg sack depending upon consistency required. (Use stiffer consistency for overhead hand application)

Allow the mortar to rest for 2 - 3 minutes and then remix briefly, adjusting the consistency as required, without exceeding the maximum water demand.

(e) Mortar application:

Air and substrate temperatures must be a minimum of +5°C and a maximum of +30°C. The minimum temperatures must be maintained during application and for at least 24 hours thereafter for optimum curing of the product.

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

Emaco[®] Nanocrete R3 can be hand, trowel or spray applied. Apply mixed product 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.

Apply to the desired layer thickness of 5 to max. 75 mm and level using a screeding beam, trowel or wooden board. Can be applied in thicker layers in smaller patches or where additional reinforcement is present.

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

Cleaning of tools

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

Curing

The following curing methods are advised:

- polyethylene film
- damp cloths
- Masterkure curing agents*

* Contact your local BASF Construction Chemicals office for more information.

Coverage / Yield

One 20kg sack will yield approximately 11 litres of mortar.

Approx. 1.8 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

Emaco[®] Nanocrete R3 is available in 20 kg bags.

Storage

Store in cool and dry warehouse conditions. Shelf life in these conditions is 12 months in unopened original sacks.

Watch points

- Do not apply at temperatures below +5°C nor above +30°C.
- Do not add cement, sand or other substances that could affect the properties of the material.
- Never add water or fresh mortar to a mortar mix which has already begun to set.
- Contact Technical Department of your local BASF Construction Chemicals office regarding any information required not mentioned here.

Handling and transport

Usual preventive measures for the handling of chemical products should be observed when manipulating this product, for example do not eat, smoke or drink while working and wash your hands when taking a break or when the job is completed. Specific safety information in the handling and transport of this product can be found in the Material Safety Data Sheet.

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.

The disposal of the product and its container should be carried out according to local legislation in force. Responsibility for this lies with the final owner of the product.

NOTE:

Similar to all the other recommendations and technical information, this technical data sheet serves only as a description of the product characteristics, mode of use and applications. The data and information given are based on our technical knowledge obtained in the bibliography, laboratory tests and in practice. The data on consumption and dosage contained in this data sheet are based on our own experience and are therefore subject to variations due to different work conditions. Real consumption and dosage should be determined on the job by means of prior tests and are the liability of the client. Our Technical Service is at your disposal for any additional advice.

BASF Construction Chemicals Belgium N. V. reserves the right to modify the composition of the products provided these continue to comply with the characteristics described in the data sheet. Other applications of the product not covered by those indicated shall not be our liability. In the case of defects in the manufacturing quality of our products we provide a guarantee, any additional claims being exempt and our liability being only to return the value of the goods supplied. The possible reservations with respect to patents or third party rights should be noted.

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The present data sheet becomes null and void on issuance of a new edition.

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