

Fosroc® Nitomortar S

constructive solutions

High strength, abrasion-resistant epoxy reinstatement mortar

Uses

For the fast and permanent reinstatement of concrete, particularly where high strength, abrasion-resistance and resistance to chemicals is required. The product is designed for horizontal use but can be applied vertically, although generally in thinner sections. It is ideally suited for acid tanks, sea walls, industrial floors and for use as a bedding mortar. Nitomortar S can be used for emergency repairs where fast strength gain is important. When properly compacted, the mortar is highly impermeable.

In certain instances, Nitomortar S can be used on metal substrates. Contact the local Fosroc office for advice in this respect.

For fast repairs in vertical and overhead locations where a higher-build, lightweight formulation is required, the use of Nitomortar HB is recommended.

Advantages

- High ultimate strength — suitable for structural use
- Early development of strength minimises disruption
- Abrasion-resistance — suitable for heavily trafficked areas
- Highly resistant to a wide range of chemicals
- Cured product is highly impermeable to water when 'tight trowel' finished
- Typically twice as strong as good quality concrete
- Pre-weighed components ensure consistency

Description

Nitomortar S is based on a high quality solvent-free epoxy resin system. The special silica aggregates provide high strength and excellent abrasion resistance. Nitomortar S is a three-component material supplied in pre-weighed quantities ready for on-site mixing and use.

Properties

The following results were obtained at a temperature of 20°C unless otherwise specified.

Test method	Typical result
Compressive strength (EN 12190:1999):	70 N/mm ² @ 7 days
Flexural strength (BS 6319, Pt 3):	20 N/mm ² @ 7 days
Tensile strength (ASTM C 307):	10 N/mm ² @ 7 days
Compressive modulus (ASTM C 469):	16.2 kN/mm ² @ 28 days
Water absorption:	0.2% (concrete - 5.0%)
Pot life:	45 minutes @ 20°C 20 minutes @ 35°C
Initial hardness:	24 hours
Full cure:	7 days

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EN1504-3: Structural and non-structural repair methods 3, 4 and 7	
Compressive strength	≥ 45 MPa
Chloride ion content	≤ 0.05%
Adhesion strength by pull-off test	≥ 2.0 MPa
Thermal compatibility: freeze-thaw cycling with immersion	≥ 2.0 MPa
Carbonation resistance	dk ≤ control concrete
Capillary absorption (water permeability)	≤ 0.5kg/(m ² .h ^{0.5})
Elastic Modulus	≥20GPa
Stiffening time	Declared value
Determination of workability	Declared value

Test method	Typical result
Fresh wet density:	Approximately 2015 kg/m ³ (fully compacted)
Chemical resistance:	The low permeability of Nitomortar S retards chemical attack in aggressive environments

Performance of Nitomortar S blocks continually immersed at 20°C:

Chemical	Concentration	Result
Citric acid	10%	Excellent
Tartaric acid	10%	Excellent
Hydrochloric acid	25%	Excellent
Sodium hydroxide	50%	Excellent
Diesel fuel / petrol	100%	Excellent
Sulphuric acid	10%	Very good
Sugar solutions	Saturated	Very good
Lactic acid	10%	Very good
Hydrocarbons	100%	Very good
Phosphoric acid	50%	Very good
Nitric acid	10%	Good
Acetic acid	5%	Limited

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Application instructions

Preparation

Clean the surface and remove any dust, unsound material, plaster, oil, paint, grease, corrosion deposits or algae. Roughen the surface and remove any laitance by light scabbling or grit-blasting. Saw cut or cut back the extremities of the repair locations to a depth of at least 5 mm to avoid feather-edging and to provide a square edge. Break out the complete repair area to a minimum depth of 5 mm up to the sawn edge.

Oil and grease deposits should be removed by steam cleaning, detergent scrubbing or the use of a proprietary degreaser. The effectiveness of decontamination should then be assessed by a pull-off test.

Expose fully any corroded steel in the repair area and remove all loose scale and corrosion deposits. Steel should be cleaned to a bright condition paying particular attention to the back of exposed steel bars. Grit-blasting is recommended for this process.

Reinforcing steel priming

The cleaned steel should be coated within 3 hours. Apply one full coat of Nitoprime Zincrich Plus and allow to dry before continuing. If any doubt exists about having achieved an unbroken coating, a second application should be made and, again, allowed to dry before continuing.

Substrate priming

Horizontal or damp substrates should be primed using Nitoprime 25. Predominantly vertical and metal substrates should be primed using Nitoprime 28. In both cases, the primer should be mixed in the proportions supplied, adding the entire contents of the 'hardener' tin to the 'base' tin. The two components should be thoroughly mixed together for 3 minutes.

The mixed primer should be scrubbed well into the prepared substrate, taking care that all imperfections in the surface are properly coated and avoiding 'puddling' in depressions. If the primer is absorbed within 30 minutes, a second coat should be applied before continuing. Nitomortar S can be applied as soon as the primer has started to gel but still has surface 'tack'. This is normally between 30 minutes and 4 hours dependent on the ambient and substrate temperatures. If the primer cures hard, a second application must be made before application of Nitomortar S. The usable life of the mixed primer is approximately 60 minutes at 20°C or 30 minutes at 35°C.

Mixing

Care should be taken to ensure that Nitomortar S is thoroughly mixed to produce a fully homogeneous, trowellable mortar.

'Standard' packs may be mixed by hand. The 'hardener' and 'base' components should be stirred thoroughly in order to

disperse any settlement before mixing them together. The entire contents of the 'hardener' and 'base' containers should then be emptied into the plastic bucket and thoroughly mixed for 3 minutes. While mixing continuously, the entire bag of aggregate should then be added slowly and the three components blended together for a further 2 to 3 minutes, ensuring that the aggregate is thoroughly wetted out with the mixed resins. Under no circumstances should part packs be used.

'Industrial' packs must be mixed mechanically. Again, the 'hardener' and 'base' components should be stirred thoroughly in order to disperse any settlement before mixing them together. The entire contents of the 'hardener' container should then be emptied into the 'base' container and thoroughly mixed for 3 minutes, then emptied into a forced action mixer of adequate capacity (e.g. Daines, Cretangle or Pennine). Add the aggregate slowly with the mixer running and continue for 2 to 3 minutes until all the components are thoroughly blended.

Under no circumstances should part packs be used.

Application

Apply the mixed Nitomortar S to the prepared substrate by wood float, pressing firmly into place to ensure positive adhesion and full compaction. Thoroughly compact the mortar around any exposed reinforcement. In restricted locations, or where exposed reinforcing steel is present, application by gloved hands is an acceptable alternative but, in all cases, the product must be finished to a tight surface with a steel trowel. Nitomortar S can be applied in sections up to 50 mm thickness in horizontal locations or up to 6 mm thickness in vertical locations in a single application and without the use of formwork. Thicker vertical sections may sometimes be possible dependent on the profile of the substrate and the volume of exposed reinforcing steel but should generally be built up in layers.

When larger areas are being rendered, a chequerboard application technique is recommended.

Note: the minimum applied thickness of Nitomortar S is 5 mm.

Build-up

Additional build-up can be achieved by application of multiple layers. Exposed steel reinforcing bars should be firmly secured to avoid movement during the application process as this will affect mortar compaction, build and bond.

Where thicker sections are required, the surface of the intermediate applications should be scratch-keyed to provide a suitable surface for subsequent layers. The application of additional layers should follow between 8 and 24 hours (@ 20°C) after the first application. This time should be reduced at higher temperatures. Repriming and a further application of Nitomortar S may then proceed.

If sagging occurs during application, the Nitomortar S should be completely removed and reapplied at a reduced thickness on to the correctly reprimed substrate.

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Finishing

Nitomortar S is finished by the use of a wood float and closed with a steel trowel. The completed surface should not be overworked.

Low temperature working

Nitoprime 25, Nitoprime 28 and Nitomortar S can be applied in cold conditions down to 5°C. The materials should not be applied when the substrate and/or air temperature is 5°C and falling. At 5°C static temperature or at 5°C and rising, the application may proceed.

High temperature working

At ambient temperatures above 35°C, Nitoprime 25, Nitoprime 28 and Nitomortar S will have shorter pot lives and working lives. The materials should be stored in the shade or in an air-conditioned environment and should not be applied in direct sunlight.

Curing

Unlike cementitious materials Nitomortar S does not require curing immediately after finishing, but does require protection from rain and wet conditions during the initial 24 hours after placement.

Overcoating with protective/decorative finishes

Nitomortar S is extremely durable and resistant to a wide range of acids, alkalis and industrial chemicals and will provide excellent protection to the concrete and embedded steel reinforcement within the repaired locations. The surrounding parts of the structure may benefit from the application of a protective coating, thus bringing them up to the same protective standard as the repair itself. Fosroc recommend the use of the Nitocote range of epoxy resin, chemical-resistant, protective coatings.

For surrounding areas not subjected to chemical attack or physical wear, Fosroc recommend the use of the Dekguard range of anti-carbonation, anti-chloride protective coatings. These products provide a decorative and uniform appearance as well as protecting areas of the structure which might otherwise be at risk from the environment.

Nitocote epoxy resin protective coatings should be applied within 24 hours. Dekguard products should not be applied until the Nitomortar S is at least 3 days old. For further advice, consult the local Fosroc office.

Cleaning

Nitoprime Zincrich Plus, Nitoprime 25, Nitoprime 28 and Nitomortar S should be removed from tools, equipment and mixers with Fosroc Solvent 102 immediately after use.

Estimating

Supply

Nitomortar S:	5 kg 'Standard' packs 16 kg 'Industrial' packs
Nitoprime Zincrich Plus:	1.9 litre and 800ml cans
Nitoprime 25:	0.95 kg 'Handy' packs 5 kg 'Industrial' packs
Nitoprime 28:	0.45 kg 'Handy' packs 4.2 kg 'Industrial' packs
Fosroc Solvent 102:	5 and 25 litre tins

Coverage and yield

Nitomortar S:	2.5 litres / 5 kg 'Standard' pack 8.0 litres / 16 kg 'Industrial' pack
Nitoprime Zincrich Plus:	8 m ² /litre
Nitoprime 25:	5 m ² / 0.95 kg 'Handy' pack 26 m ² / 5 kg 'Industrial' pack
Nitoprime 28:	2.4 m ² / 0.45 kg 'Handy' pack 20 m ² / 4.2 kg 'Industrial' pack

Notes: the coverage figures for Nitoprime Zincrich Plus and Nitoprime 28 are theoretical — due to wastage factors and the variety and nature of possible substrates, practical coverage figures will be reduced.

Limitations

Nitomortar S should not be used when the temperature is below 5°C and falling. Do not mix part packs under any circumstances. Nitomortar S should not be used in overhead locations — use Nitomortar HB for this purpose. Nitomortar S should not be exposed to moving water during application. Exposure to heavy rainfall prior to the final set will result in surface softening and scour. Nitoprime 28 is not a damp tolerant primer. If any doubts arise concerning temperature or substrate conditions, consult the local Fosroc office.

Storage

Store in dry conditions in the original, unopened bags or packs. All products have a shelf life of 18 months at 20°C if kept in a dry store in the original, unopened bags or packs.

If stored at high temperatures, the shelf life may be reduced to 4 to 6 months.

Precautions

Health and safety

For further information refer to the appropriate Product Safety Data Sheet.

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Fire

Nitomortar S is non-flammable.

Nitoprime Zincrich Plus, Nitoprime 28 and Fosroc Solvent 102 are flammable. Keep away from sources of ignition. No smoking. In the event of fire, extinguish with CO₂ or foam. Do not use a water jet.

Flash points

Nitoprime Zincrich Plus: 41°C

Fosroc Solvent 102: 33°C

Nitoprime 28 27°C

For further information, refer to the Product Safety Data Sheets.

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Important note

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