



constructive solutions

Nitobond SBR*

Polymer bonding aid and additive for mortars, screeds and renders

Uses

For improving the physical properties of cementitious mixes. Typical uses include, but are not limited to, the following :

- Bonding concrete repair mortars
- Floor toppings and screeds
- Waterproof renders and cementitious slurries
- Bonding agent for slip bricks, ceramic tiles, etc.
- Spatterdash for bonding render and plaster

Advantages

- Single component liquid can be easily gauged as required
- Improves cohesion and workability
- Improves mortars to provide waterproof repairs, renders and toppings which are highly resistant to freeze/thaw cycling
- Improved tensile and flexural properties allow thin applications
- Excellent bond to concrete, masonry, stonework, plaster and blockboard
- Contains no chloride admixtures

Specification

Polymer bonding aid and mortar additive

The polymer bonding aid and site-batched mortar shall be modified by the use of Nitobond SBR, a single component styrene butadiene rubber emulsion.

Description

Nitobond SBR is a modified styrene butadiene rubber emulsion which is supplied as a ready to use white liquid. It is designed to improve the quality of site-batched cementitious mortars and slurries. Being resistant to hydrolysis, it is ideal for internal and external applications in conjunction with cement.

APPROVALS

- Contact with drink water
- WRAS - Water Regulations Advisory Scheme
- Passed full test of effect on water quality - BS 6920

Typical Properties

The results listed below were achieved by assessing the mechanical properties of a 3:1 sand:cement mortar containing Nitobond SBR in the proportions 10 litres per 50 kg cement against a 3:1 sand:cement control mortar. The test methods used were in full accordance with BS 6319 at 28 days - air cured.

Test method	Typical result
Compressive strength (BS 6319, Pt 2:1983)	: 50-60 N/mm ²
Tensile strength (HKHA/MTS 2002-04 Specification clause 2.1-3):	>3.0 N/mm ²
Flexural strength (BS 6319, Pt 3:1983)	: >5.0 N/mm ²
Bond strength (HKHA/MTS 2002-04 Specification Part D clause 2.1.14)	: 1.7 N/mm ²
Water Absorption (BS 1881:Part 122:1983 (AMD6108))	: <0.9% (Control Sample:4.5%)
Chemical resistance	: Cementitious materials have limited chemical resistance. The addition of Nitobond SBR to cement mortars reduces permeability and therefore helps reduce the rate of attack by aggressive chemicals, acid gases and water.

Design criteria

The application parameters for mortars modified by the use of Nitobond SBR will differ depending on the actual mix design used, but should always be subject to a minimum applied thickness of 6 mm.

Nitobond SBR-modified mortars can generally be applied in sections of up to 40 mm thickness in horizontal locations and 15 mm in vertical locations, without the use of formwork.

In overhead locations the thickness achievable without the use of formwork is largely dependent on the profile of the substrate. Consult the local Fosroc office for further information.

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Mix Design

A wide range of mix designs is achievable using Nitobond SBR. Typical designs are detailed below:

Mix A. Patching and repair mortar

(Recommended thickness: 6 mm to 40 mm)

50 kgs Ordinary Portland Cement
150 kgs grade C/M sharp sand
10 litres Nitobond SBR
8 litres (approximately) clean water

Mix B. Heavy-duty floor screed

(Recommended thickness: 10 mm to 40 mm)

50 kgs Ordinary Portland Cement
75 kgs 3 to 6 mm granite chips
75 kgs grade C/M sharp sand
10 litres Nitobond SBR
6 litres (approximately) clean water
The screed should be of a semi-dry cohesive consistency.

Mix C. Render

(Recommended thickness: 6mm to 9mm)

50 kgs Ordinary Portland Cement
150 kgs grade C/M sharp sand
10 litres Nitobond SBR
6 litres (approximately) clean water
The render should be of a semi-dry cohesive consistency.

Mix D. Bonding mortar for slip bricks, tiles, etc

(Recommended thickness: 6 mm to 40 mm)

50 kgs Ordinary Portland Cement
125 kgs grade C/M sharp sand
10 litres Nitobond SBR
7 litres (approximately) clean water
Water is adjusted to give a firm mortar. For fine joints, use grade M/F sand. Support where necessary until the mortar is set.

Mix E. Spatterdash for bonding render

1 Part Nitobond SBR
1 Part Clean Water
4 Parts Cement
8 Parts Sand

Note that these mix designs are based on the use of dry sand and aggregate. Adjustments must be made to the water demand relative to the moisture content of the sand and aggregate used.

It should also be noted that, due to the frequent inconsistencies of site-stored materials and variable conditions, actual results may differ from those published above.

Instructions for use

Preparation

Form the extremities of the application area to a depth of at least 10 mm to avoid feather-edging and to provide a square edge. Ensure a minimum depth of 6 mm is observed in the remaining area, up to the previously formed edge.

Clean the surface and remove any dust, unsound or contaminated material, plaster, oil, paint, grease, corrosion deposits or algae. Oil and grease deposits should be removed by steam cleaning, detergent scrubbing or the use of a proprietary degreaser.

Where breaking out is not required, roughen the surface and remove any laitance by light scabbling or grit-blasting. The effectiveness of decontamination should then be assessed by a pull-off test.

Preparation of reinforcement (repairs only)

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.

Where corrosion has occurred due to the presence of chlorides, the steel should be high-pressure washed with clean water immediately after grit-blasting to remove corrosion products from pits and imperfections within its surface.

Reinforcing steel priming

Apply one full coat of Nitoprime Zincrich (WB) to any exposed steel reinforcement 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

The substrate should be thoroughly soaked with clean water and any excess removed prior to commencement. A slurry primer should be prepared consisting of 1 volume Nitobond SBR to 1 volume clean water to 3 volumes fresh cement. To obtain a smooth consistency, the cement should be blended slowly into the premixed liquids. The slurry primer should be stirred frequently during use to offset settlement.



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The slurry primer should be scrubbed well into the surface of the substrate, being careful to avoid 'ponding'. The repair mortar, topping or render must be applied on to the wet slurry primer. If the slurry primer dries before application of the mortar, it must be removed and the area reprimed before continuing.

Low temperature working

In cold conditions down to 5°C, the use of warm water (up to 30°C) is advisable to accelerate strength development. Normal precautions for winter working with cementitious materials should then be adopted.

High temperature working

At ambient temperatures above 35°C, the material should be stored in the shade and cool water used for mixing.

Mixing

Care should be taken to ensure that Nitobond SBR mortars are thoroughly mixed. A forced-action mixer is essential for large volume applications. Mixing in a suitably sized drum using an approved spiral paddle in a slow speed (400/500 rpm) heavy-duty drill is acceptable for minor areas.

Weigh the cement, sand and, where required, aggregate into the mixer and dry blend together for one minute. With the machine in operation, add the pre-mixed Nitobond SBR and clean water. Continue mixing for 3 minutes to ensure complete dispersal into the sand and cement.

Make any small adjustment to the quantity of clean water but do not significantly exceed the literage shown above, additional water should be kept to a minimum.

Continue mixing up to a maximum of 5 minutes until a smooth and fully homogeneous consistency is achieved with the required workability and application properties. It is critical that allowance is made for the moisture content of the sand and aggregate, particularly where stored on site.

Application

For application to all surfaces, Nitobond SBR mortars, toppings and renders must be well-compacted on to the primed substrate by trowel. It is frequently beneficial to work a thin layer of the mortar into the slurry primer and then build the mortar on to this layer. Exposed steel reinforcement should be completely encapsulated by the mortar.

Nitobond SBR mortars can be applied at a minimum thickness of 6 mm and up to 40 mm thickness, dependent on the location and configuration of the repair zone. Refer to the recommended thicknesses shown in the 'Mix design' section.

If the recommended thickness is exceeded and sagging occurs, the affected section must be completely removed and reapplied in accordance with the procedure described above. The use of formwork may facilitate achieving the required build. If formwork is used, it should have properly sealed faces to ensure that no water is absorbed from the repair material.

Where thicker sections (up to a total thickness of 40 mm) are to be built up by hand or trowel application, the surface of the intermediate layers should be scratch-keyed and cured with Nitobond AR. Application of the slurry primer and a further application of Nitobond SBR mortar may proceed as soon as this layer has set.

Spatterdash Application

Mix thoroughly the Spatterdash mix and maintain consistency during application by occasional stirring. If necessary, the dosage of Nitobond SBR can be increased to 1.5 parts at the maximum. The materials should be mixed with a slow speed drill and mix for 3-5 minutes until the mix is consistent.

Apply the spatterdash to the clean, prepared surface. Allow to fully cure before application of render.

Finishing

Nitobond SBR mortars can be finished with a steel, plastic or wood float, or by a damp sponge technique, to achieve the desired surface texture. The completed surface should not be overworked.

Curing

Nitobond SBR mortars, toppings and renders are cement-based. In common with all cementitious materials, they must be cured immediately after finishing in accordance with good concrete practice.

The use of Nitobond AR or Concure RB90, sprayed on to the surface of the finished mortar in a continuous film, is recommended. In harsh drying conditions, supplementary curing with polythene sheeting must be used.

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Overcoating with protective decorative finishes

Nitobond SBR mortar repairs are extremely durable and will provide excellent protection to the embedded steel reinforcement within the repaired locations.

The surrounding parts of the structure will generally benefit from the application of a barrier/decorative coating to limit the advance of chlorides and carbon dioxide, thus bringing them up to the same protective standard as the repair itself.

Fosroc recommend the use of the Dekguard range of protective, anti-carbonation 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.

Dekguard products may be applied over the repair area without prior removal of the Nitobond AR curing membrane. Concure RB90 curing membrane must be removed prior to the application of Dekguard products. This is best achieved by light grit or sand-blasting.

Cleaning

Nitobond SBR and Nitobond AR should be removed from tools, equipment and mixers with clean water immediately after use. Cured material can only be removed mechanically. Equipment used with Nitoprime Zincrich (WB) and Concure RB90 should be cleaned using suitable solvent.

Limitations

- Nitobond SBR mortars, toppings and renders should not be applied when the temperature is below 5°C and falling.
- Nitobond SBR mortars should not be exposed to moving water during application. Exposure to heavy rainfall prior to the final set may result in surface scour.
- If any doubts arise concerning temperature or substrate conditions, consult the local Fosroc office.

Technical support

Fosroc offers a comprehensive technical support service to specifiers, end users and contractors. It is also able to offer on-site technical assistance, and dedicated specification assistance in locations all over the world.

Estimating

Supply

Nitobond SBR	:	25 and 200 litre drums
Nitoprime Zincrich (WB)	:	0.75 litre packs
Nitobond AR	:	20 litre drums
Concure RB90	:	25 and 200 litre drums

Coverage

Nitobond SBR	:	Refer to mix designs
Nitobond SBR (as slurry primer)	:	Approx. 2 to 3 m ² /litre
Nitoprime Zincrich (WB)	:	6.5-8.5m ² /litre
Nitobond AR	:	6 to 8 m ² /litre
Concure RB90	:	3.5 to 5 m ² /litre

Note: The actual usage of Nitobond SBR will depend on the mix design used. The coverage figures for liquid products including the Nitobond SBR slurry primer are theoretical - due to wastage factors and the variety and nature of possible substrates, practical coverage figures will be reduced.

Note: In accordance with Commercial or Health & Safety requirements packaging detail may alter. Please contact your local Fosroc office for detail.

Storage

Shelf life

If kept in a dry store in the original, unopened bags or packs, all products(except Nitoprime Zincrich (WB)) have a shelf life of 12 months, Nitoprime Zincrich (WB) has a shelf life of 6 months.

Storage conditions

Store in dry conditions in the original packs. If stored at high temperatures and/or high humidity conditions the shelf life may be reduced. Nitobond SBR and Nitobond AR should be protected from frost.

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Precautions

Health and safety

Cementitious mortars and slurries modified with Nitobond SBR contain cement powders which, when mixed or become damp, release alkalis which can be harmful to the skin. During use, avoid inhalation of dust and contact with skin and eyes. Wear suitable protective clothing, gloves, eye protection and respiratory protective equipment. The use of barrier creams provide additional skin protection. In case of contact with skin, rinse with plenty of clean water, then cleanse with soap and water. In case of contact with eyes, rinse immediately with plenty of clean water and seek medical advice. If swallowed, seek medical attention immediately - **do not** induce vomiting.

Nitoprime Zincrich (WB), Nitobond products and Concure RB90 should not come in contact with the skin and eyes, or be swallowed. Ensure adequate ventilation and avoid inhalation of vapours. Some people are sensitive to resins, hardeners and solvents. Wear suitable protective clothing, gloves and eye protection. If working in confined areas, suitable respiratory protective equipment must be used. The use of barrier creams provide additional skin protection.

In case of skin contact with Nitoprime Zincrich (WB) and Concure RB90, remove immediately with resin removing cream followed by washing with soap and water. Do not use solvent. In case of contact with eyes, rinse immediately with plenty of clean water and seek medical advice. If swallowed, seek medical attention immediately - **do not** induce vomiting.

Fire

Nitobond SBR, Nitobond AR are non-flammable.

Nitoprime Zincrich (WB) mixture is non-flammable.

Nitoprime Zincrich (WB) powder is flammable. Keep away from water. Keep away from sources of ignition. In the event of fire, extinguish with CO₂ or foam. Do not use a water jet.

For further information see relevant Material Safety Data Sheet.

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	Mixing Ratio	Age	MIX A (Patching and repair mortar)	MIX B (Heavy-duty floor screed)	MIX C (Render)	MIX D (Bonding mortar for slip bricks,tiles,etc)	MIX E (Spatterdash for bonding render)
1) Bond Strength HKHA/MTS 2002-04 Specification Part D clause 2.1.14	Mixing E 7d	7d	—	—	—	—	1.6 MPa
2) Compressive strength of mortar cube BS 6319, Part 2:1983	Mixing A - Mixing D 28d	28d	50-60 MPa	50-60 MPa	30-40 MPa	50-55 MPa	—
3) Tensile strength HKHA/MTS (2002-04) Specification Part D clause 2.1.3	Mixing A - Mixing D 28d	28d	>3.0 MPa	>5.0 MPa	>3.0 MPa	>4.0 MPa	—
4) Flexural strength (BS 6319, Part 3:1990)	Mixing A - Mixing D 28d	28d	>7.0 MPa	>9.0 MPa	>5.0 MPa	>7.0 MPa	—
5) Water Absorption of 75mm concrete core (Including drilling of core from 100mm cube) BS 1881:Part 122:1983	Control & Mixing A - Mixing D		0.4~0.5% (4.5% for Control Sample)	0.2% (4.5% for Control Sample)	0.8~0.9% (4.5% for Control Sample)	0.2~0.3% (4.5% for Control Sample)	—

* The above are typical laboratory test results.Different cement brands may result in variation of strengths and water absorption.

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