Fosroc® Nitobond SBR

constructive solutions

Polymer bonding aid and mortar additive

Uses

For improving and bonding concrete repair mortars, floor toppings and screeds, waterproof renders and cementitious slurries. Mortars and bonding slurries produced with Nitobond SBR may be used for horizontal, vertical and overhead repair work and are suitable for permanent immersion. Nitobond SBR may be used to form a bonding agent for slip bricks, ceramic tiles, etc.

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 blockwork
- Contains no chloride admixtures
- Can be applied to damp substrates

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 qualities of site-batched cementitious mortars and slurries. Being resistant to hydrolysis, it is ideal for internal and external applications in conjunction with cement.

Specification clause

Polymer bonding aid and mortar additive: The bonding coat and site-batched mortar / render / screed shall be modified by the addition of Nitobond SBR, a single component styrene butadiene rubber emulsion. The Nitobond SBR liquid polymer shall be incorporated in the bonding coat and mix design to achieve the required application characteristics, applied and cured in accordance with the manufacturer's written instructions.

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	Control
Compressive strength (BS 6319, Pt 2: 1983):	62 N/mm^2	46 N/mm^2
Tensile strength (ASTM C-190-85):	3.3 N/mm^2	2.7 N/mm^2
Flexural strength (BS 6319, Pt 3: 1983):	9 N/mm^2	7.9 N/mm^2
Slant shear bond (BS 6319, Pt 4: 1984):	53 N/mm^2	11 N/mm^2
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.	

Application instructions

Preparation

Angle form or cut back the extremities of the repair locations to a depth of at least 10 mm to avoid feather-edging and to provide a square edge. Break out the complete repair area to a minimum depth of 6 mm up to the angle formed edge.

Clean the surface and remove any dust, unsound or contaminated material, plaster, oil, paint, grease, corrosion deposits or algae. Where breaking out is not required, roughen the surface and remove any laitance by light scabbling or grit-blasting.

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. Abrasive blasting, hydrodem equipment, powered mechanical scraping or other suitable means 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 Plus 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.

The slurry primer should be scrubbed well into the surface of the concrete. Avoid applying too thickly and avoid 'puddling'. 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.

In exceptional circumstances, e.g. where a substrate /repair barrier is required Nitobond EP bonding aid should be used. Contact the local Fosroc office for further information.

Mixing

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

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

1. Patching and repair mortar:
50 kgs Ordinary Portland Cement
150 kgs grade C/M sharp sand
10 litres Nitobond SBR
8 litres (approximately) clean water
Recommended thickness: 6 mm to 40 mm.

2. Heavy-duty floor screed:
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. Recommended thickness: 10 mm to 40 mm.

3. Render:
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. Recommended thickness: 6 mm to 9 mm.

4. Bonding mortar for slip bricks, tiles, etc:
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. Recommended thickness: 6 mm to 40 mm.
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.

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 they are 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. Where thicknesses over 40mm are to be applied in one application, reduce the Nitobond SBR content by 40%.

The thickness achievable in overhead locations without the use of formwork is largely dependent on the profile of the substrate. Refer to the recommended thicknesses shown in the 'Mix design' section above. 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.

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.

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.

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 WB, 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.

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 WB 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 Plus, Nitobond EP and Concure WB should be cleaned with Fosroc Solvent 102. Cured material can only be removed mechanically.

Estimating

Supply

Nitobond SBR:	5 and 210 litre drums
Nitoprime Zincrich Plus:	1.9 litre and 800ml cans
Nitobond EP:	4.5 kg packs
Nitobond AR:	5 litre drums
Concure WB:	20 litre drums
Fosroc Solvent 102:	5 litre cans

Coverage and yield

Nitobond SBR:	Refer to mix designs
Nitobond SBR (as slurry primer):	Approximately 2 to 3 m^2 / litre
Nitoprime Zincrich Plus:	8 m^2 / litre
Nitobond EP:	10 to 11.5 m^2 / pack
Nitobond AR:	6 to 8 m^2 /litre
Concure WB:	3.5 to 5 m^2 / litre

Limitations

Nitobond SBR mortars, toppings and renders should not be applied when the temperature is below 5°C and falling. Neither should they 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.

Storage

Shelf Life

Store in unopened packaging in cool dry internal conditions. Nitobond SBR and Nitobond AR should be protected from frost.

The product has a shelf life of 12 months from the date of manufacture if kept in a dry storage in the original, unopened packaging between 5°C and 25°C.

Nitoprime Zincrich Plus must be stored in accordance with the Highly Flammable Liquids and Liquefied Petroleum Gases Regulations 1972.

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Precautions

Health and safety

For further information refer to appropriate Product Safety Data Sheet.

Fire

Nitobond SBR, Nitobond AR, Concure WB and Nitobond EP are non-flammable.

Nitoprime Zincrich Plus and Fosroc Solvent 102 are flammable. Keep away from sources of ignition. No smoking. In the event of fire, extinguish with CO_2 or foam. Do not use a water jet.

Flash points

Nitoprime Zincrich Plus:	41°C
Fosroc Solvent 102:	33°C

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

Fosroc International Limited
Drayton Manor Business Park
Coleshill Road, Tamworth,
Staffordshire B78 3XN. UK

telephone:
+44 0 (1827) 262222

fax:
+44 0 (1827) 262444

email:
enquiryuk@fosroc.com

www.fosroc.com

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ISO 14001 Environmental Management EMS 61113