

Renderoc NSLA

Single component free-flowing micro-concrete

Uses

The highly fluid nature of **Renderoc NSLA** obviates the need for compaction and vibration even where access to the repair zone is restricted or where reinforcement is congested. The product is ideal for the reinstatement of large, structural sections of concrete as well as for many smaller locations where difficulties of access make hand or trowel-applied mortars impractical. It is suitable for use where excellent chloride and carbon dioxide resistance is required. **Renderoc NSLA** is alkaline in nature and will protect embedded steel reinforcement.

Advantages

- Dual expansion system compensates for shrinkage in the plastic and hardened states
- Exceptional bond to concrete substrates without independent primer
- Suitable for placement by pumping or pouring techniques into restricted locations
- Self-compacting nature eliminates honeycombing and displaces air without vibration
- High strength and low permeability provide maximum protection against carbon dioxide and chlorides
- Pre-bagged to overcome site-batched variations - only the site addition of clean water is required
- Contains no chloride admixtures

Standards compliance

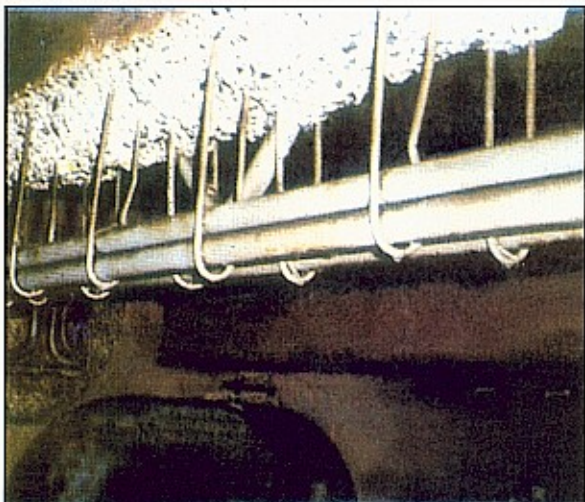
Renderoc NSLA conforms to the requirements of the UK Department of Transport Standard (BD27/86, Clause 4) 'Materials for the Repair of Concrete Highway Structures'.

Description

Renderoc NSLA is supplied as a ready to use blend of dry powders which requires only the site addition of clean water to produce a free-flowing, shrinkage compensated micro-concrete suitable for large volume concrete repairs at nominal thicknesses in excess of 50 mm. The material is based on Portland cement, graded aggregates and additives which impart controlled expansion in both the plastic and hardened states while minimising water demand. The hardened product exhibits excellent thermal compatibility with concrete and outstanding water repellent properties. The aggregate grading is designed to aid uniform mixing and to eliminate segregation under pumping pressures. The low water requirement ensures fast strength gain and long-term durability.

Technical Support

Fosroc offers a comprehensive range of high performance, high quality construction products. In addition, **Fosroc** offers a technical support service to specifiers, end-users and contractors, as well as on-site technical assistance in locations all over the world.



Before repair



After repair

Renderoc NSLA

Design criteria

Renderoc NSLA is designed for large volume repairs typically in excess of 50 mm deep. The product can be applied in sections generally up to 500 mm thick although greater thicknesses may be achievable dependent on the configuration of the repair location and the volume of exposed reinforcing steel. Consult the local Fosroc office for further information.

Properties

The following results were obtained at a water:powder ratio of 0.133 and temperature of 20°C.

| Test method | Typical result |
|---|--|
| Flow properties (UK Dept of Transport BD 27/86 Clause 4.6[b]): | 750 mm within 10 secs |
| Setting time (BS 4550) - Initial set: | 6 hours, 30 mins @ 20°C |
| Final set: | 9 hours @ 20°C |
| Compressive strength (BS 1881 Pt 116 - restrained): | 30 N/mm ² @ 3 days 45 N/mm ² @ 7 days 60 N/mm ² @ 28 days |
| Water absorption ISAT (BS 1881 Pt 5: 1970) - 10 mins: | 0.0125 ml/m ² /sec |
| 2 hours: | 0.0013 ml/m ² /sec |
| Coefficient of thermal expansion: | 10 to 12 x 10 ⁻⁶ /°C |
| Modulus of elasticity (BS 1881 Pt 121:1983 - cylinders cast under restraint and wet-cured): | 33 kN/mm ² @ 28 days |
| Bond strength (BS 6319 slant/shear - substrate presoaked, no bonding aid): | 66 N/mm ² @ 28 days |
| Fresh wet density: | Approximately 2270 kg/m ³ dependent on actual consistency used. |

Specification clauses

Steel reinforcement primer

The steel reinforcement primer shall be **Nitoprime Zincrich**, a single component zinc-rich epoxy resin. The primer shall be an 'active' type, capable of avoiding the generation of incipient anodes in the immediately adjacent locations. It shall be fully compatible with the **Renderoc** system of concrete repair.

Fluid micro-concrete repair system

The fluid repair system (micro-concrete) shall be **Renderoc NSLA** a single component, cement-based blend of powders to which only the site-addition of clean water shall be permitted. The micro-concrete shall exhibit a 3-day compressive strength not less than 30N/mm² and a 28 day compressive strength of 60 N/mm² (at 20°C). The coefficient of thermal expansion shall be within the range of 10 to 12 x 10⁻⁶/°C.

Application instructions

Preparation

The unrestrained surface area of the repair must be kept to a minimum. The formwork should be rigid and tight to prevent loss of material and have properly sealed faces to ensure that no water is absorbed from the repair material. The formwork should include drainage outlets for presoaking and, if beneath a soffit, provision for air-venting. Provision must also be made for suitable access points to pour or pump the mixed micro-concrete into place.

Saw cut 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 50 mm up to the sawn 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. 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** 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

Several hours prior to placing, the prepared concrete substrates should be saturated by filling the prepared formwork with clean water. Immediately prior to the application of **Renderoc NSLA**, any excess water should be removed.

FOSROC



constructive solutions

Renderoc NSLA

Mixing

Care should be taken to ensure that **Renderoc NSLA** is 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. Free-fall mixers must not be used. Mixing of part bags should never be attempted.

It is essential that machine mixing capacity and labour availability is adequate to enable the placing operation to be carried out continuously. Measure 4.0 litres of drinking quality water and pour three-quarters into the mixer. With the machine in operation, add one full 30 kg bag of **Renderoc NSLA** and mix for one minute before adding the rest of the water. Mix for a further 2 to 3 minutes until a smooth even consistency is obtained. Note that powder must always be added to water. The quantities mixed may be scaled up as required.

When the drill and paddle mixing method is used, the complete 4.0 litres of water should be placed in the mixing drum. With the paddle rotating, add one full 30 kg bag of **Renderoc NSLA** and mix for 2 to 3 minutes until a smooth even consistency is obtained.

It is recommended that the mixed product be passed through a suitable coarse metal screen prior to placing or pumping to highlight any unmixed material.

Placing

The mixed material should be placed within 30 minutes of mixing in order to gain the full benefit of fluidity and of the expansion process. If placing by pump, standard concrete pumping practice should be followed. The pump and pipeline must be 'grouted' with a rich cement slurry or mortar, discharging the 'grout' as waste. Pumping should be commenced immediately after 'grouting' in this way.

High temperature working

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

Curing

The formwork should be left in place until the compressive strength of the **Renderoc NSLA** is 10N/mm² or as otherwise specified by the Supervising Officer. **Renderoc NSLA** is a cement-based concrete reinstatement material. In common with all cementitious materials, **Renderoc NSLA** must be cured immediately after the formwork is stripped in accordance with good concrete practice. Immediately after striking the formwork, all exposed faces of the repair should be thoroughly soaked with clean water and then sprayed with a liquid curing membrane such as **Concure P** or **Concure 90 Clear**. In fast drying conditions, supplementary curing with polythene sheeting taped down at the edges must be used.

Overcoating with protective decorative finishes

Renderoc NSLA is 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. All traces of form-release oils and curing membranes must be removed prior to the application of **Dekguard** products. This is best achieved by light grit or sand-blasting.

Cleaning

Renderoc NSLA and **Concure P** should be removed from tools, equipment and mixers with clean water immediately after use. Cured material can only be removed mechanically.

Limitations

Renderoc NSLA should not be used when the temperature is below 5°C and falling. Do not mix part bags. The product should not be used to reinstate horizontal areas where the surface would remain unrestrained during cure. It should not be exposed to moving water during application. If any doubts arise concerning temperature, application or substrate conditions, consult the local **Fosroc** office.

Estimating

Supply

| | |
|----------------------------|------------------------|
| Renderoc NSLA: | 30 kg bags |
| Nitoprime Zincrich: | 1 litre & 5 litre tins |
| Concure P: | 200 litre drums |
| Concure 90 Clear: | 25 and 200 litre drums |

Coverage and yield

| | |
|----------------------------|-------------------------------------|
| Renderoc NSLA: | Approximately 14.5 litres/30 kg bag |
| Nitoprime Zincrich: | 7.4 m ² /litre |
| Concure P: | 5 m ² /litre |
| Concure 90 Clear: | 4 to 5 m ² /litre |

Notes: the coverage figures for liquid products are theoretical - due to wastage factors and the variety and nature of possible substrates, practical coverage figures will be reduced.

FOSROC



constructive solutions

Renderoc NSLA

Storage

Shelf life

All products have a shelf life of 6 months if kept in a dry store in the original, unopened bags or packs.

Storage conditions

Store in dry conditions in the original, unopened bags or packs. If stored at high temperatures and/or high humidity conditions the shelf life may be reduced to 3 to 6 months.

Precautions

Health and safety

Renderoc NSLA contains 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 and Concure products should not come into contact with skin or 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 contact with skin, rinse with plenty of clean water, then cleanse with soap and water. In case of skin contact with Nitoprime Zincrich, and Concure 90 Clear, 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.

Additional information

Fosroc manufactures a wide range of products specifically designed for the repair and refurbishment of damaged reinforced concrete. This includes hand-placed and spray grade repair mortars, fluid micro-concretes, chemical-resistant epoxy mortars and a comprehensive package of protective coatings. In addition, a wide range of complementary products is available. This includes joint sealants, waterproofing membranes, grouting, anchoring and specialised flooring materials.

Fosroc have also produced several educational training videos which provide more detail about the mechanisms which cause corrosion within reinforced concrete structures and the solutions which are available to arrest or retard these destructive mechanisms. Further information is available from the publication: 'Concrete Repair And Protection - The Systematic Approach', available in seven language formats.

For further information about products, training videos or publications, contact the local Fosroc office.

Fire

Renderoc NSLA, Nitobond EP and Concure P are non flammable.

Nitoprime Zincrich and Concure 90 Clear 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: | 16°C |
| Concure 90 Clear: | 40°C |



PT. Fosroc Indonesia

Jl. Akasia II Blok A8 No. 1
Delta Silicon Industrial Park
Lippo Cikarang
Bekasi 17550
Indonesia

www.fosroc.com

Important note

Fosroc products are guaranteed against defective materials and manufacture and are sold subject to its standard terms and conditions of sale, copies of which may be obtained on request. Whilst Fosroc endeavours to ensure that any advice, recommendation, specification or information it may give is accurate and correct, it cannot, because it has no direct or continuous control over where or how its products are applied, accept any liability either directly or indirectly arising from the use of its products, whether or not in accordance with any advice, specification, recommendation or information given by it.

telephone:

+ 62 21 897 2103
+ 62 22 520 1308
+ 62 31 502 9142

fax:

+ 62 21 897 2107
+ 62 22 522 2713
+ 62 31 502 2711

email:

indonesia@fosroc.com

