



Renderoc S

Single component structural grade polymer modified concrete reinstatement mortar

Uses

For the reinstatement of large areas of concrete and for small, localised patch repairs. **Renderoc S** is alkaline in nature and will protect embedded steel reinforcement. It is specifically designed for locations where high compressive strengths are required or in locations where good abrasion resistance is necessary. The mortar is suitable where superior resistance is required to chlorides and carbon dioxide.

Advantages

- High strength and high abrasion resistance
- Can be applied by the wet or dry spray process for fast, exceptionally high build repairs with enhanced characteristics
- Extremely low permeability provides maximum protection against carbon dioxide and chlorides
- Excellent bond to the concrete substrate
- Shrinkage compensated
- Pre-bagged to overcome site-batched variations - only the site-addition of clean water required
- Contains no chloride admixtures

Standards compliance

Renderoc S, Nitoprime Zincrich and Nitobond AR have been approved by the British Board of Agreement, Certificate No. 91/2582.

Description

Renderoc S is supplied as a ready to use blend of dry powders which requires only the site addition of clean water to produce a highly consistent, high strength repair mortar. The material is based on Portland cement, graded aggregates, special fillers and chemical additives and is polymer modified to provide a mortar with good handling characteristics, while minimising water demand. The hardened product exhibits excellent thermal compatibility with concrete and outstanding water repellent properties. 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.

Design criteria

Renderoc S is designed for vertical or horizontal use. It can be applied up to 10 mm thickness in vertical sections. Up to 100 mm thickness can be achieved in small pockets or by the use of formwork. In horizontal locations, **Renderoc S** can be applied up to 100 mm thickness. Thicker sections can be built up in layers. The material should not be applied at less than 5 mm thickness. Thicknesses greater than 10 mm in large areas can be achieved by spray application. Consult the local Fosroc office for further information.

Properties

The following results were obtained at a water:powder ratio of 0.11 and temperature of 20°C.

Test method	Typical result
Compressive strength (BS 6319 Pt 2:1983 - dry cure):	25 N/mm ² @ one day 55 N/mm ² @ 28 days
Flexural strength (BS 6319 Pt 3:1983):	10 N/mm ² @ 28 days
Water absorption ISAT (BS1881 Pt5: 1970)- 10 minutes:	0.008 ml/m ² /sec
2 hours:	< 0.005 ml/m ² /sec
Chloride diffusion (Taywood Method):	11x10 ⁻¹⁰ cm ² /sec
Carbon dioxide barrier - Equivalent thickness of concrete to Renderoc S @ 10 mm (Taywood Method):	250 mm
Equivalent thickness of air to Renderoc S @ 10 mm (Taywood Method):	70 metres
Coefficient of thermal expansion:	7 to 12 x10 ⁻⁶ per °C
Setting time (BS 5075) Initial set:	3 hours, 15 mins
Final set:	4 hours, 30 mins
Fire rating (BS 476 Pt 4: 1970):	Non-combustible (Class 0 surface)
Fresh wet density:	Approximately 2300 kg/m ³ dependent on actual consistency used.

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Chemical resistance:	The low permeability of Renderoc S severely retards chemical attack in aggressive environments. The cured mortar is highly impermeable to acid gases, chloride ions, oxygen and water.
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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.

Repair mortar

The polymer modified shrinkage-compensated reinstatement mortar shall be **Renderoc S**, a single component cement-based blend of powders to which only the site-addition of clean water shall be permitted. The cured mortar shall achieve 55 N/mm² compressive strength and 10 N/mm² flexural strength at 28 days. Chloride diffusion coefficient shall be not greater than 11×10^{-10} cm²/sec (by the Taywood Method) and a 10 mm section of cured mortar shall provide a carbon dioxide barrier equivalent to not less than 250 mm concrete or 70 metres air (by the Taywood Method).

Application instructions

Preparation

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 10 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

The substrate should be thoroughly soaked with clean water and any excess removed prior to applying one coat of Nitobond AR primer and scrubbing it well into the surface. **Renderoc S** can be applied as soon as the primer becomes tacky. If the Nitobond AR is too wet, vertical build up of the **Renderoc S** mortar may be difficult.

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

Mixing

Care should be taken to ensure that **Renderoc S** 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 for the occasional one-bag mix. Free-fall mixers must not be used. Mixing of part bags should never be attempted.

For normal applications, place 2.5 to 3.0 litres of drinking quality water into the mixer and, with the machine in operation, add one full 25 kg bag of **Renderoc S** and mix for 3 to 5 minutes until fully homogeneous. Note that powder must always be added to water. Dependent on the ambient temperature and the desired consistency, the amount of water required may vary slightly but should not exceed 3.0 litres per 25 kg bag of **Renderoc S**.

Application

Exposed steel reinforcing bars should be firmly secured to avoid movement during the application process as this will affect mortar compaction, build and bond.

Apply the mixed **Renderoc S** to the prepared substrate by gloved hand or trowel. Thoroughly compact the mortar on to the primed substrate and around the exposed reinforcement. **Renderoc S** can be applied up to 10 mm

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thickness in vertical sections but up to 100 mm thickness in smaller pockets or with the use of formwork. If formwork is used, it should have properly sealed faces to ensure that no water is absorbed from the repair material. In horizontal locations, **Renderoc S** can be applied up to 100 mm thickness.

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

Note: the minimum applied thickness of **Renderoc S** is 5 mm,

Spray application

Renderoc S can be applied by the wet or dry spray techniques. In circumstances where large areas of repair are required, the rapid placement and higher build attainable by these methods offer economic advantages over hand-trowelling. The resultant repair also offers a generally more dense compound with greatly enhanced mortar/substrate bond characteristics. For further details on the wet and dry spray techniques, including selection of spraying machines and nozzles, consult Fosroc's Wet or Dry Spray Application Guides or the local Fosroc office.

Finishing

Renderoc S is finished by striking off with a straight edge and closing with a steel float. Wooden or plastic floats, or damp sponges may be used 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. The material 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, the material should be stored in the shade and cool water used for mixing.

Curing

Renderoc S is a cement-based repair mortar. In common with all cementitious materials, **Renderoc S** must be cured immediately after finishing in accordance with good concrete practice. The use of Nitobond AR, sprayed on to the surface of the finished **Renderoc** in a continuous film, is recommended. Large areas should be cured as trowelling progresses (0.5 m² at a time) without waiting for completion of the entire area. In fast drying conditions, supplementary

curing with polythene sheeting taped down at the edges must be used. In cold conditions, the finished repair must be protected from freezing.

Overcoating with protective decorative finishes

Renderoc S 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. Dekguard products may be applied over the repair area without prior removal of the Nitobond AR curing membrane. Other curing membranes must be removed prior to the application of Dekguard products.

Cleaning

Nitobond AR and **Renderoc S** 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 and Nitobond EP should be cleaned with Fosroc Solvent 102.

Limitations

Renderoc S should not be used when the temperature is below 5°C and falling. Do not mix part bags. The product 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.

Estimating

Supply

Renderoc S:	25 kg bag
Nitoprime Zincrich:	1 litre can
Nitobond AR:	20 litre pail
Nitobond EP:	4.5 kg pack
Fosroc Solvent 102:	5 litre can

Coverage and yield

Renderoc S:	Approximately 12.0 litres/25 kg bag (1.2 m ² at 10 mm thickness)
Nitoprime Zincrich:	7.4 m ² /litre
Nitobond AR:	6 to 8 m ² /litre
Nitobond EP:	10 to 11.5 m ² /pack



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Notes: the actual yield per bag of **Renderoc S** will depend on the consistency used. The yield will be reduced if the material is applied by a spray technique. 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.

UN packaging regulations

To comply with current regulations, all products of a hazardous nature which are subjected to a sea crossing as part of their delivery requirements, must be packed in UN approved receptacles.

When a known sea crossing is involved, whether locally or for export, Fosroc will supply in the correct UN packaging. Where Fosroc are requested to deliver within a mainland boundary but the Purchaser intends to onward ship, it is incumbent upon the Purchaser to specify that UN packaging is required at the time of placing the order. Otherwise, once received, responsibility rests with the Purchaser. The use of UN packaging may affect the selling price of products. Please consult the local Fosroc office.

Storage

Shelf life

All products have a shelf life of 12 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 4 to 6 months. Nitobond AR should be protected from frost.

Precautions

Health and safety

Renderoc S 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, Nitobond products and Fosroc Solvent 102 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 contact with skin, rinse with plenty of clean water, then cleanse with soap and water. In case of skin contact with Nitoprime Zincrich and Nitobond EP, 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

Renderoc S, Nitobond AR and Nitobond EP are non-flammable.

Nitoprime Zincrich 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 water jet.



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Important note

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