



constructive solutions

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
- Reduced shrinkage
- Pre-bagged to overcome site-batched variations - only the site-addition of clean water required
- Contains no chloride admixtures

Standards compliance

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

Approved for contact with potable water in accordance with BS6920.

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 comprehensive technical support, including help at the design stage, application advice and on site problem solving. Specifiers and contractors are encouraged to contact our trained staff for answers to their questions. For further information please contact Fosroc.

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 form work. In horizontal locations, Renderoc S can be applied up to 100 mm thick. 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 your local Fosroc office for further information.

Typical Properties

The following are typical results for Renderoc S mixed at a water:powder ratio of 0.11 and cured at 20°C.

Test method	Typical result
Compressive strength	
(BS 6319 Pt 2: 1983 - dry cure):	25 N/mm ² @ one day 60 N/mm ² @ 28 days
Flexural strength	
(BS 6319 Pt 3: 1983):	10 N/mm ² @ 28 days
Water absorption ISAT	
(BS 1881 Pt 5: 1970) –	
10 mins:	0.008 ml/m ² /sec
2 hours:	< 0.005 ml/m ² /sec
Chloride diffusion	
(Taywood Method):	11 x 10 ⁻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 x 10 ⁻⁶ /°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 (WB), two components water-based zinc-rich primer. 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 65 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 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.

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 (WB) 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 SBR / cement slurry 1:1.5 by volume) and scrubbing it well into the surface. Renderoc S can be applied as soon as the primer becomes tacky. If the bond coat is too wet, vertical build up of the Renderoc S mortar may be difficult. If the slurry bond coat dries before application of the repair mortar, it must be removed and the area reprimed before continuing.

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 Slowset bonding aid should be used. Contact your 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.



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Mixing warning

As with other 'one pack' repair mortars, Renderoc S may exhibit satisfactory handling characteristics even though inadequately mixed. This will result in a significantly lower level of performance or possible failure. It is therefore essential that mixing instructions are strictly adhered to with particular emphasis on the quantity of water used and the time of the mixing operation.

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 thick in vertical sections and up to 100 mm thick 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 thick.

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 5mm.

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, please refer to Fosroc's Wet or Dry Spray Application Guides or your 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 or Concure WB 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 recommends 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.

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Cleaning

Nitobond SBR, Nitoprime Zincrich (WB) 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 Nitobond EP Slowset should be cleaned with suitable solvent.

Sampling Procedure

Fosroc standard test methods must be employed when performance testing this product. For full information please contact your local Fosroc office.

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 your local Fosroc office.

Estimating

Supply

Renderoc S:	25 kg bags
Nitoprime Zincrich (WB):	0.75 litre packs
NitobondAR:	20 litre drums
NitobondSBR:	20, 25 and 200 litre drums
Nitobond EP Slowset:	4 litre packs

Coverage and yield

Renderoc S:	Approximately 12.0 litres/25 kg bag (1.2 m ² at 10 mm thickness)
Nitoprime Zincrich (WB):	6.5-8.5 m ² /litre
NitobondSBR:	2 to 5 m ² /litre (diluted as slurry bond coat)
NitobondAR:	6 to 8 m ² /litre
Nitobond EP Slowset:	15 m ² /4 litre pack

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, 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 and Nitobond SBR 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 (WB) and Nitobond products 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 (WB) and Nitobond EP Slowset, 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.



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Fire

Renderoc S, Nitobond SBR, Nitoprime Zincrich (WB) liquid, Nitobond AR and Nitobond EP Slowset 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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Renderoc is the trademark of Fosroc International Ltd.



Important note

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