**Fosroc® Renderoc HB**

**High performance lightweight concrete reinstatement mortar conforming to the requirements of BS EN 1504-3 Class R2**

**Uses**

For the reinstatement of concrete where low permeability characteristics are required but where high compressive strength is not the most important consideration. If high compressive strengths and low permeability characteristics are required, Renderoc HB45 should be used.

Renderoc HB has been specifically developed for vertical and overhead repair work where its lightweight nature and high build characteristics makes it ideal.

Renderoc HB is suitable for repair methods 3.1, 3.3, 7.1, 7.2 as defined by BS EN 1504-3.

**Advantages**

- Compatibility with non-structural concrete of compressive strength 20 - 35 N/mm²
- Lightweight formulation enables extra high-build — fewer cold joints
- Frequently obviates the need for formwork
- Polymer-modification provides extremely low permeability to water, carbon dioxide and chlorides
- Exceptional system of shrinkage compensation provides long-term dimensional stability
- Can be applied quickly and efficiently by wet spraying
- One component, pre-bagged to overcome site-batched variations
- Contains no chloride admixtures

**Description**

Renderoc HB is supplied as a ready to use blend of dry powders requiring only the site addition of clean water to produce a highly consistent, lightweight repair mortar.

It is based on Portland cements, graded aggregates, lightweight fillers and chemical additives which provide a mortar with good handling characteristics while minimising water demand. The low water requirement ensures good strength gain and long-term durability.

Renderoc HB has been specifically engineered for vertical and overhead repair work. It can be applied in sections up to 80 mm thickness in vertical locations and up to 50 mm thickness in overhead locations in a single application and without the use of formwork. Thicker sections can be achieved by the use of formwork or can be built up in layers. Deep pockets can sometimes be filled in a single application dependent on the configuration of the pocket and the volume of exposed reinforcing steel.

Renderoc HB can be quickly and efficiently applied by the wet spray technique. Consult the local Fosroc office for further information.

The material should not be applied at less than 10 mm thickness.

**Standards compliance**

Renderoc HB complies with the class R2 according to EN1504-3, repair methods 3.1, 3.3, 7.1 and 7.2.

Renderoc HB, Nitoprime Zincrich Plus, Nitobond AR and Nitobond HAR have been approved by the British Board of Agrement, Certificate No 98/3461.

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**EN 1504-3**

Concrete repair products for non-structural repair PCC mortar (based on polymer modified hydraulic cement)

<table>
<thead>
<tr>
<th>Property</th>
<th>Class R2 (≥ 15 MPa)</th>
<th>≤ 0.05 %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compressive strength</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chloride ion content</td>
<td></td>
<td>≥ 0.8 MPa</td>
</tr>
<tr>
<td>Adhesive bond strength after freeze thaw thermal cycling</td>
<td></td>
<td>≥ 0.8MPa</td>
</tr>
<tr>
<td>Reaction to fire</td>
<td></td>
<td>Class A2 s1 d0</td>
</tr>
<tr>
<td>Dangerous substances</td>
<td></td>
<td>Complies with 5.4</td>
</tr>
</tbody>
</table>

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Fosroc® Renderoc HB

Properties
The following results were obtained at a water:powder ratio of 0.18 and at a temperature of 20°C unless otherwise stated.

<table>
<thead>
<tr>
<th>Test method</th>
<th>Standard</th>
<th>EN 1504 R2 Requirement</th>
<th>Test result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compressive Strength</td>
<td>EN 12190:1999</td>
<td>≥ 15 MPa</td>
<td>@ 1 Day 10 MPa @ 28 Days 22 MPa</td>
</tr>
<tr>
<td>Bond strength by pull off</td>
<td>EN 1542:1999</td>
<td>≥ 0.8 MPa</td>
<td>1.0 MPa</td>
</tr>
<tr>
<td>Chloride ion content:</td>
<td>EN 1015-17:2000</td>
<td>≤ 0.05 %</td>
<td>0.02 %</td>
</tr>
<tr>
<td>Freeze thaw cycling:</td>
<td>EN 13687-1:2002</td>
<td>≥ 0.8 MPa</td>
<td>0.8 MPa</td>
</tr>
<tr>
<td>Fire rating</td>
<td>EN 13501-1</td>
<td>-</td>
<td>Class A2 s1 d0 Non-Combustible</td>
</tr>
<tr>
<td>Setting time</td>
<td>BS 4551 Pt 14:1980</td>
<td>-</td>
<td>Initial set: 3.5 hours</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Final set: 5.5 hours</td>
</tr>
<tr>
<td>Fresh wet density</td>
<td></td>
<td>-</td>
<td>Nominally 1430 kg/m³</td>
</tr>
<tr>
<td>Shrinkage</td>
<td></td>
<td>-</td>
<td>&lt; 300 microstrain @ 7 days</td>
</tr>
<tr>
<td>(25 x 25 x 285 prisms,</td>
<td></td>
<td></td>
<td>The low permeability of Renderoc</td>
</tr>
<tr>
<td>27 °C, 55% RH</td>
<td></td>
<td></td>
<td>HB severely retards chemical</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>attack in aggressive</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>environments. The cured mortar</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>is impermeable to acid gases,</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>waterborne chloride ions and</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>oxygen.</td>
</tr>
<tr>
<td>Chemical resistance</td>
<td>-</td>
<td>-</td>
<td></td>
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<tr>
<td>Build Characteristics hand</td>
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<td>-</td>
<td></td>
</tr>
<tr>
<td>applied</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Minimum thickness:</td>
<td>-</td>
<td>-</td>
<td>10 mm</td>
</tr>
<tr>
<td>Overhead:</td>
<td>-</td>
<td>-</td>
<td>Up to 50 mm</td>
</tr>
<tr>
<td>Vertical:</td>
<td>-</td>
<td>-</td>
<td>Up to 80 mm</td>
</tr>
</tbody>
</table>

Clarification of property values: The typical properties given above are derived from laboratory testing. Results derived from field applied samples may vary.

Application instructions

Preparation
Saw cut the edges of the repair to a depth of at least 10 mm 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 abrasive-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 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 abrasive-blasting to remove corrosion products from pits and imperfections within its surface.

Reinforcing steel priming
Apply one full coat of Nitoprime Zincrich Plus 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.
Concrete Priming

The concrete substrate should be saturated surface dry immediately before the application of the primer i.e. it should be thoroughly saturated with clean water and any residual surface water removed prior to applying Nitobond HAR.

Under severe drying conditions repeated soaking may be necessary to ensure the substrate is still saturated at the time of application of the primer.

Scrub Nitobond HAR into the surface.

Renderoc HB can be applied as soon as the primer becomes tacky. If the Nitobond HAR is too wet, overhead and vertical build up of the Renderoc HB may be difficult.

In exceptional circumstances, e.g. where a substrate/repair barrier is required or where the substrate is water immersed 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 HB is thoroughly mixed. A forced-action mixer is essential. Mixing in a suitably sized drum using an approved Renderoc Spiral Paddle with 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 3.1 to 3.4 litres of drinking quality water into the mixer.

With the machine in operation, add one full bag of Renderoc HB and mix, for a minimum of 3 minutes and a maximum of 5 minutes, until fully homogeneous.

The consistency may be adjusted by the addition of small amounts of water up to the maximum total water content of 3.4 litres.

Note that the powder must always be added to the water.

Mixing warning

As with other ‘one pack’ repair mortars, Renderoc HB 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 prevent movement during application.

Apply the mixed Renderoc HB by gloved hand or trowel, thoroughly compacting onto the primed substrate and around exposed reinforcement.

If sagging or slumping occurs Renderoc HB should be completely removed and reapplied at a reduced thickness to a correctly primed substrate.

Build-up

Additional build-up can be achieved by application of multiple layers.

The surface of the intermediate layers should be comb scratch-keyed and cured with Nitobond AR. Repriming with Nitobond HAR and a further application of Renderoc HB may proceed as soon as this layer has set.

Spray application

Renderoc HB can be quickly and efficiently applied by the wet spray technique. In circumstances where large areas of repair are required, the rapid placement and higher build attainable by this method offer economic advantages over hand-trowelling. The resultant repair also offers a generally more dense compound with enhanced mortar/substrate bond characteristics.

For further details on wet spray techniques contact the local Fosroc office.

Finishing

Renderoc HB 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. After spray application, the mortar may need to be ‘cut back’ to the required profile using a steel float and then finished with damp sponges as described above.

Low temperature working

In cold conditions down to 5°C, the use of warm mixing 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 HB is a cement-based repair mortar. In common with all cementitious materials, it 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 mortar in a continuous film, is recommended. A low pressure atomising sprayer is essential for applying the Nitobond AR. Any excessive run-off on verticals or drips on soffits should be removed by brush before they harden.

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 HB is extremely durable and will provide long-term protection to the embedded steel reinforcement within the repaired locations. The surrounding parts of the structure will benefit from the application of a barrier/decorative coating to limit the advance of chlorides and carbon dioxide, bringing them 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**

Renderoc HB and Nitobond HAR should be removed from tools, equipment and mixers with clean water immediately after use. Cured material can only be removed mechanically. Clean tools used with Nitoprime Zincrich Plus and Nitobond EP before material cures using Fosroc Solvent 102.

**Estimating**

**Supply**

- **Renderoc HB**: 18 kg bags
- **Nitoprime Zincrich Plus**: 1.9 litre and 800 ml cans
- **Nitobond HAR**: 5 and 25 litre drums
- **Nitobond AR**: 5 and 25 litre drums
- **Fosroc Solvent 102**: 5 and 25 litre tins

**Coverage and yield**

- **Renderoc HB**: Approximately 14.5 - 15.0 litres / 18 kg bag (approximately 1.5 m² at 10 mm thickness)
- **Nitoprime Zincrich Plus**: 8 m²/litre
- **Nitobond AR**: 6 - 8 m²/litre
- **Nitoprime HAR**: 3 - 4 m²/litre

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

**Limitations**

Renderoc HB should not be used when the temperature is below 5°C and falling. Do not mix part bags. Due to the lightweight nature of Renderoc HB, the product should not be used in areas subjected to traffic (in these circumstances, Renderoc S should be considered).

Renderoc HB 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.

**Storage**

The product has a shelf life of 12 months from the date of manufacture if kept in dry storage in the original, unopened bags. If stored at high temperatures and/or high humidity the shelf life may be reduced to less than 6 months.

Nitobond AR and Nitobond HAR should be protected from frost.

**Precautions**

**Health and safety**

For further information refer to the appropriate Safety Data Sheets available at www.fosroc.com

**Fire**

Renderoc HB is 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 CO₂ or foam. Do not use a water jet

**Flash points**

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

Important note

Fosroc products are guaranteed against defective materials and manufacture and are sold subject to its standard Conditions for the Supply of Goods and Services, copies of which may be obtained on request. Whilst Fosroc endeavours to ensure that any advice, recommendation, specification of 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 of information given by it.