Renderoc HB40

constructive solutions

High-technology medium weight concrete reinstatement mortar

Uses

For the reinstatement of large areas of concrete and for small, localised patch repairs. Renderoc HB40 is alkaline in nature and will protect embedded steel reinforcement. It is specifically designed for vertical and overhead repair work where a medium-weight mortar is required.

Advantages

- Medium weight formulation enabling high build and thereby saving time and expense of multiple applications
- Obviates the need for formwork
- Polymer-modification provides extremely low permeability to water, carbon dioxide and chlorides
- Excellent bond to the concrete substrate
- Exceptional system of shrinkage compensation
- One component, pre-bagged to overcome site-batched variations
- Contains no chloride admixtures

Standards compliance

Renderoc HB40 has been tested and approved in accordance with the Product Conformity Certification Scheme for Repair Mortar (PCCS-RM) TM1 to TM6 (2010).

Description

Renderoc HB40 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, medium weight repair mortar. The material 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 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 HB40 can be applied in sections up to 40 mm thickness in vertical locations and up to 30 mm thickness in overhead locations in a single application and without the use of formwork. Thicker sections should be built up in layers but are sometimes possible in a single application depending on the actual configuration of the repair area and the volume of exposed reinforcing steel. The material should not be applied at less than 10 mm thickness. Greater thicknesses than those specified above can be achieved by spray application or by the use of formwork. Please consult Fosroc for further information.

Typical Properties

The test methods used were in full accordance with the Product Conformity Certification Scheme for Repair Mortar (PCCS-RM) TM1 - TM6 (2010). Specimens were stored at 27°C and 55% RH. The physical properties below are typical of the results obtained in practice.

Test method	Description of Test	Typical result
TM1	Compressive strength	28-33 MPa @ 7days 35-40 MPa @ 28 days
TM2	Tensile strength	> 2 MPa @ 7 days
TM3	Elastic modulus	15-25 kN/mm^2 @ 28 days
TM4	Bond strength	> 2 MPa @ 7 days
TM5	Shrinkage - Coutinho Ring	No cracks @ 7 days No cracks @ 28 days
TM6	Figg air permeability	> 200 secs @ 35 days
BS6319:Pt3:1983	Flexural strength	> 5 MPa @ 7 days
HKHA/MTS (2000/2002) Specification Part D Cl.2.1.21	Drying shrinkage	< 300 Microstrains @ 7 days

Notes:

(i) The specimens were stored in full accordance with the Product Conformity Certification Scheme for Repair Mortar (PCCS-RM) (2010).

(ii) TM1 toTM4 and Flexural strength are based on BS6319 Part 2.

(iii) TM1, TM2, TM3, TM4, TM5 & TM6 are requirements of the Product Conformity Certification Scheme for Repair Mortar (PCCS-RM) (2010).

Fresh wet density: approximately 1930 kg/m^3 depending on actual consistency used.

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

As a carbon dioxide barrier, a 10mm thickness of Renderoc HB40 is equivalent to a 600mm thickness of 30MPa concrete.

Renderoc HB40

Specification clauses

The polymer modified reinstatement mortar shall be Renderoc HB40, a single component cement-based blend of powders to which only the site-addition of clean water shall be permitted. The reinstatement mortar shall comply fully with the Product Conformity Certification Schene for Repair Mortar (PCCS-RM) TM1 to TM6 and shall exhibit a fresh wet density of 1930 kg/m^3.

Application instructions

Surface preparation

Clean the surface and remove any dust, unsound material, plaster, oil, paint, grease, corrosion deposits or algae. Roughen the surface and remove any laitence by light scabbling or grit-blasting. 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.

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.

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 (any excess being removed prior to commencement) prior to applying a slurry primer mixed with 1 part of Nitobond SBR to 1.5 parts of cement by volume. The bond coat should be scrubbed into the surface of the concrete. Avoid applying too thickly. The repair mortar should be applied as soon as the bond coat becomes ‘tacky’. If the bond coat is too wet, achieving the desired build may be difficult. If the bond coat becomes dry, build and bond will be reduced. If a Nitobond SBR / cement slurry coat dries before application of the repair mortar, it must be removed and the area reprimed before continuing.

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

Mixing

Care should be taken to ensure that Renderoc HB40 is thoroughly mixed. A forced-action mixer is essential. Mixing in a suitably sized drum using "Renderoc" mixing paddle in a slow speed (400/500 rpm) heavy-duty (min 1kw) drill is an acceptable alternative. Mixing of part bags should never be attempted.

For normal applications, place 3.8 to 4.2 litres of clean water into the mixer and, with the machine in operation, add one full 25 kg bag of Renderoc HB40 and mix for 3 to 5 minutes until fully homogeneous. Note that powder must always be added to water.

Application

For application to all surfaces, Renderoc HB40 must be well-compacted on to the primed substrate by trowel or by gloved hand. Exposed steel reinforcement should be completely encapsulated by the mortar. Renderoc HB40 can be applied at a minimum thickness of 10 mm and up to 40 mm thickness in vertical locations in a single application and without the use of formwork. Overhead thicknesses between 10 mm and 30 mm can be made in a single application, depending on the nature of the substrate and the details of the location. If the recommended thicknesses are exceeded and sagging occurs, the affected section must be completely removed and reapplied in accordance with the procedure described above. Greater thicknesses than those specified above can be achieved by spray application or by the use of formwork.

Where thicker sections are required by hand or trowel application, the surface of the intermediate layers should be scratch-keyed and cured with Nitobond AR. Application of a further (Nitobond SBR/cement slurry) bond coat and a further application of Renderoc HB40 may proceed as soon as this layer reached initial set (typically 2-3 hours, depending on temperature and humidity).

Finishing

Renderoc HB40 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.

High temperature working

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

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.

Curing

Renderoc HB40 is a cement-based repair mortar. In common with all cementitious materials, Renderoc HB40 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. In harsh drying conditions, supplementary curing such as polythene sheeting must be used. Concure WB must be removed before overcoating.

Overcoating

The completed area of the repair can be overcoated generally after 24 hours. Fosroc recommends the use of the Dekguard range of protective, anti-carbonation coatings. These products also provide a decorative and uniform appearance as well as protecting other 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.

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 HB40 should not be used when the temperature is below 5°C and falling. Do not mix part bags. Due to the medium weight nature of Renderoc HB40, the product should not be used in areas subject to traffic. Exposure to heavy rainfall prior to the final set may result in surface scour.

Estimating

Supply

Note: In accordance with Commercial or Health & Safety requirements packaging detail may alter. Please contact your local Fosroc office for detail.

Renderoc HB40:	25 kg bags
Nitoprime Zincrich WB:	1 and 4.5 litre tins
Nitobond SBR:	5 and 25 litre drums
Nitobond AR:	20 litre drums
Nitobond EP Slowset:	4 litre packs

Coverage and yield

Renderoc HB40:	Approximately 16 litres per 25 kg bag (16mm thickness per m^2 per 25kg bag)
Nitoprime Zincrich WB:	7.4 m^2/litre
Nitobond SBR:	2 to 5 m^2/litre (diluted as slurry bond coat)
Nitobond AR:	6 to 8 m^2/litre
Nitobond EP Slowset:	10 to 11.5 m^2/pack

Notes: the actual yield per bag of Renderoc HB40 will depend on the consistency used. 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.

Storage

Shelf life

All products have a shelf life of 9 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. Nitobond SBR, and Nitobond AR should be protected from frost.

Renderoc HB40

Precautions

Health and safety

Renderoc HB40 contains cement powders which, during normal use, have no harmful effect on dry skin. However, when Renderoc HB40 is mixed, or becomes damp, alkali is released which can be harmful to the skin. During use, avoid inhalation of dust and contact with skin and eyes. Nitoprime Zincrich WB and Nitobond products should not be allowed to come into contact with skin or eyes or be swallowed.

Wear suitable gloves, eye protection and dust masks. The use of barrier creams is recommended. In case of contact with skin, wash with clean 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.

For further information see relevant Material Safety Data Sheet.

Fire

Renderoc HB40, Nitobond SBR, Nitobond AR and Nitoprime Zincrich WB are non-flammable.

Flash points

Nitoprime Zincrich WB:	**16°C**

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.

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

Renderoc is the trademark of Fosroc International Limited.

FOSROC

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 Service, 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.