

Renderoc HB40*



High performance medium-weight concrete reinstatement mortar

Uses

Renderoc HB40 is suitable for reinstatement of large areas of reinforced concrete where low permeability and high compressive strengths are important considerations. Typical applications of Renderoc HB40 would include, but not be limited, to the following:

- Repairs of columns and beams
- Soffits and overhead repairs
- Large areas of reinforced concrete repair
- Localised small patch repairs

Advantages

- Maximum compatibility with concrete of compressive strength greater than 30N/mm².
- High-build applications possible while maintaining higher compressive strengths - fewer cold joints.
- Frequently obviates the need for formwork.
- 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
- Renderoc Galvashield XP compatible

Standards compliance

Renderoc HB40 has been approved by the British Board of Agrement, Certificate No. 98/3461.

Description

Renderoc HB40 concrete reinstatement mortar 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. It gives good handling characteristics while minimising water demand. The low water requirement ensures good strength gain and long term durability.

Renderoc HB40 is designed to achieve maximum compatibility with concrete with a compressive strength greater than 30N/mm².

Build can be dramatically increased by wet spraying. Typical achievable thicknesses are 70 to 110mm vertically and 60 to 85mm overhead, although this will depend on substrate profiles and the distribution of steel reinforcement. Consult the local Fosroc office for further information.

Where strengths below 30N/mm² and/or higher builds are required, Renderoc HB25 should be used.

Properties

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

Test method	Typical Result
Compressive strength (BS6319 Pt2:1983-dry cure)	: 12 N/mm ² @ 1 day 31 N/mm ² @ 7 days 40 N/mm ² @ 28 days
Flexural strength	: 6.9 N/mm ² @ 28 days
Modulus of elasticity in compression (BS6319:Pt7:84)	: 18.4 kN/mm ² @28 days
Water absorption ISAT (BS1881: Pt 5:1970)	
10 minutes	: 0.006 ml/m ² /sec
2 hours	: 0.002 ml/m ² /sec
Drying Shrinkage @ 27°C/RH 55%	: <300 microstrain @ 7 days
CO₂ barrier- eqv. thick. of concrete to Renderoc HB40 @ 10mm (Taywood method)	: 600mm
Chloride diffusion - Taywood bulk diffusion test (accelerated)	: <5x10 ⁻¹³ m ² s ⁻¹ (low permeability concrete defined as <1x10 ⁻¹² m ² s ⁻¹)
Coefficient of thermal expansion	: 11.3 x 10 ⁻⁶ /°C
Fire rating (BS 476:Pt4:1970)	: Non combustible (Class 0 surface)
Fresh wet density	: Approximately 1800 kgm ⁻³ dependent on actual consistency used
Chemical Resistance	: Acid gasses, water borne chloride ions and oxygen



Instructions for use

Preparation

Saw cut or cut back the extremities of the repair locations to a depth of at least 10mm to avoid feather edging and to provide a square edge. Break out the complete repair area to a minimum depth of 10mm upto the sawn edge.

Clean the surface and remove any contamination. 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 the 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**† 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 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 one coat of Nitobond AR**† primer and scrubbing it well into the surface. Under severe drying conditions repeated soaking may be necessary to ensure the substrate is still saturated at the time of application of the primer. Renderoc HB40 can be applied as soon as the primer becomes tacky. If the Nitobond AR is too wet, overhead and vertical build up of the Renderoc HB40 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 HB40 is thoroughly mixed. A forced-action mixer is essential. Mixing in a suitably sized drum using a Fosroc Mixing Paddle (MR3) fitted to a heavy duty-slow speed (400-500 rpm) 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 3.4 to 3.8 litres of potable water into the mixer and, with the machine in operation, add one full 20 kg bag of Renderoc HB40 and mix for full 5 minutes until the mix becomes homogeneous. Note that the powder must always be added to the water.

Application

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

Apply the mixed Renderoc HB40 to the prepared substrate by gloved hand or trowel. Thoroughly compact the mortar onto the primed substrate and around the exposed reinforcement. Renderoc HB40 can be applied in sections upto 40mm thickness in vertical locations and upto 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 dependent on the actual configuration of the repair area and the volume of exposed reinforcing steel. Thicker applications can always be achieved by spray application - see below.

If sagging occurs during application, the Renderoc HB40 should be completely removed and reapplied at a reduced thickness on to the correctly reprimed substrate.

Note: The minimum applied thickness of Renderoc HB40 is 10mm.

Build-up

Additional build-up can be achieved by application of multiple layers. The final thickness is dependent on the material consistency and substrate profile.

Spray application

Renderoc HB40 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 HB40 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 below.

Curing

Renderoc HB40 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.

Large areas should be cured as trowelling progresses (0.5m² at a time) without waiting for completion of the entire area.

In fast drying conditions, supplementary curing with polyethylene 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

To limit the advance of chlorides and carbon-di-oxide, 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 a risk from the environment. Dekguard products may be applied over the repair area without prior removal of the Nitobond AR curing membrane. Other curing membrane must be removed prior to the application of Dekguard products.

High temperature working

Whilst the performance of Renderoc HB40 at elevated temperatures is assured, application under such conditions can sometimes be difficult. It is therefore suggested that, for temperatures above 35°C, the following guidelines are used:

- (i) Store unmixed materials in a cool (preferably temperature controlled) environment, avoiding exposure to direct sunlight.
- (ii) Keep mixing and placing equipment cool, arranging shade protection if necessary. It is especially important to keep cool those surfaces of the equipment which will come into direct contact with the material itself.
- (iii) Use cool potable water (20°C) for mixing of the material.
- (iv) Try to eliminate application in the middle of the day, and certainly avoid application in direct sunlight.
- (v) Ensure that there are sufficient operatives available to complete application within the material's pot life.

Cleaning

Nitobond AR and Renderoc HB40 should be removed from tools, equipment and mixers with clean water immediately after use. Cured material can be only removed mechanically.

Equipment used with Nitoprime Zincrich and Nitobond EP should be cleaned with Fosroc Solvent 102*.

Limitations

- Renderoc HB40 should not be used when the temperature is below 5°C and falling.
- Due to the relatively light weight nature of Renderoc HB40, the product should not be used in areas subject to traffic.
- Renderoc HB40 should not be subjected to moving water during application.,
- Exposure to rainfall prior to final set may result in surface scour.

Technical support

Fosroc offers a comprehensive technical support service to specifiers, end users and contractors. It is also able to offer on-site technical assistance, an AutoCAD facility and dedicated specification assistance in locations all over the world.

Estimating

Supply

Renderoc HB40	: 20 kg bags
Nitobond AR	: 1 and 5 lt packs
Nitoprime Zincrich	: 1 and 4.5 lt packs
Fosroc Solvent 102	: 5 lt packs

Coverage

Renderoc HB40	: Approx 13 lt/20kg bag
Nitobond AR	: 6-8m ² /lt
Nitoprime Zincrich	: 7.4m ² /lt

Note : The actual yield per bag of Renderoc HB40 will depend on the consistency used. The yield will be reduced if the material is applied by a spray technique



Storage

When stored in warehouse conditions below 35°C, Renderoc HB40 will have a shelf life of 12 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.

Precautions

Health and safety

Renderoc HB40 contains cement powders that, when mixed or become damp, release alkalis that 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 dust mask. The use of barrier creams provides additional skin protection. In case of contact with eyes, rinse immediately with plenty of clean water and seek medical advice. In case of contact with skin, rinse with plenty of clean water, then cleanse with soap and water.

Fire

Renderoc HB40 is non-flammable.

For further information, refer to Product Safety Data Sheet.

Additional Information

Fosroc manufactures a wide range of complementary products which include :

- waterproofing membranes & waterstops
- joint sealants & filler boards
- cementitious & epoxy grouts
- specialised flooring materials

Fosroc additionally offers a comprehensive package of products specifically designed for the repair and refurbishment of damaged concrete. Fosroc's 'Systematic Approach' to concrete repair features the following :

- hand-placed repair mortars
- spray grade repair mortars
- fluid micro-concretes
- chemically resistant epoxy mortars
- anti-carbonation/anti-chloride protective coatings
- chemical and abrasion resistant coatings

For further information on any of the above, please consult your local Fosroc office - as below.

* Denotes the trademark of Fosroc International Limited

† See separate data sheet



Al Gurg Fosroc LLC

P. O. Box 657
Dubai
United Arab Emirates

TEL : (04) 285 8606
FAX : (04) 285 9649

REGIONAL SALES OFFICES IN :

DUBAI	ABU DHABI	BAHRAIN	KUWAIT	OMAN	QATAR
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