Specialist Construction Supplies for Repair, Maintenance, Building & Infrastructure

Renderoc HB40 Data Sheet

Specification notes

Product: **Renderoc HB40**

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Renderoc HB40

FM 610

High performance medium-weight concrete reinstatement mortar

Uses

For the reinstatement of large areas of reinforced concrete where low permeability characteristics are required and where higher compressive strength is an important consideration. Renderoc HB40 has been engineered for the repair of columns and beams but, because of its relatively low fresh wet density, is also suitable for soffits and other overhead repair work. The mortar can also be used for small, localised patch repairs.

Where compatibility with lower strength concrete is required, but low permeability and high-build characteristics are important, Renderoc HB25 should be used.

Advantages

- Maximum compatibility with concrete of compressive strength greater than 30 N/mm²
- High-build applications possible while maintaining higher compressive strengths — 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
- Renderoc Galvashield XP compatible

Standards compliance

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

Renderoc HB40 has been tested and approved in accordance with the Hong Kong Housing Authority Specification TM1 to TM8 (1990).

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 30 N/mm².

Build can be dramatically increased by wet spraying. Typical achievable thicknesses are 70 to 110 mm vertically and 60 to 85 mm 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 30 N/mm² and/or higher builds are required, Renderoc HB25 should be used.

Properties

The following results were obtained at a water : powder ratio of 0.15 and a temperature of 20°C unless otherwise stated.

Test method	Typical result
Compressive strength (BS 6319 Pt 2: 1983 — dry cure):	
	12 N/mm² @ 1 day
	31 N/mm² @ 7 days
	40 N/mm² @ 28 days
Flexural strength (BS 6319 Pt 3: 1990):	6.9 N/mm² @ 28 days
Tensile strength (BS 6319 Pt 7: 1985):	2.9 N/mm² @ 28 days
Modulus of elasticity in compression (BS 6319 Pt 6: 1984):	18.4 kN/mm² @ 28 days
Water absorption ISAT (BS 1881 Pt 5: 1970) —	
10 minutes:	0.006 ml/m²/sec
2 hours:	0.002 ml/m²/sec
Drying shrinkage 27°C/RH55%:	< 300 microstrain @ 7 days

Carbon dioxide barrier — equivalent thickness of concrete to Renderoc HB40 @ 10 mm (Taywood method):	600 mm
Chloride diffusion — Taywood bulk diffusion test (accelerated):	$< 5 \times 10^{-13}$ m^2 s^{-1} (low permeability concrete defined as $< 1 \times 10^{-12}$ m^2 s^{-1} by non accelerated testing)
Coefficient of thermal expansion:	11.3×10^{-6}/°C
Setting time (BS 4551 Pt 14: 1980) —	
Initial set:	3 hours
Final set:	5 hours
Fire rating (BS 476 Pt 4: 1970):	Non combustible (Class 0 surface)
Fresh wet density:	Approximately 1840 kg/m^3 dependent on actual consistency used
Chemical resistance:	The low permeability of Renderoc HB40 severely retards chemical attack in aggressive environments. The cured mortar is highly impermeable to acid gases, water-borne chloride ions, and oxygen

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 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 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 HAR 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 HAR 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 an approved Renderoc 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 3.75 to 4.0 litres of drinking quality water into the mixer and, with the machine in operation, add one full 25 kg bag of Renderoc HB40 and mix for a minimum of 3 minutes to a maximum of 5 minutes until fully homogeneous. Note that the powder must always be added to the water.

Mixing warning

As with other 'one pack' repair mortars, Renderoc HB40 may exhibit satisfactory handling characteristics even though inadequately mixed. This will result in a significantly lower level of performance or possible failure.

Mixing instructions must be 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 HB40 to the prepared substrate by gloved hand or trowel. Thoroughly compact the mortar on to the primed substrate and around the exposed reinforcement. 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 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 10 mm.

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.

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 HB40 may proceed as soon as this layer has set.

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 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 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 (0.5 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

To limit the advance of chlorides and carbon dioxide, 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 HAR, Nitobond AR and Renderoc HB40 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 HB40 should not be used when the temperature is below 5°C and falling. Do not mix part bags. Due to the relatively lightweight nature of Renderoc HB40, the product should not be used in areas subjected to traffic (in these circumstances, Renderoc S should be considered). Neither should it 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 HB40:	25 kg bags

Coverage and yield

Renderoc HB40:	Approximately 15.75 litres / 25 kg bag (approximately 1.5 m² at 10 mm thickness)

Notes: 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

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.

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 the Product Safety Data Sheet.

* See separate data sheet.

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Important note