Fosroc®
Renderoc® HB40

Shrinkage compensated repair mortar suitable for use with embedded galvanic anodes

Uses

For the reinstatement of large areas of reinforced concrete where low permeability and low shrinkage characteristics are required and where higher compressive strength is an important consideration.

Renderoc HB40 has been engineered for the repair of columns and beams. Its relatively low fresh wet density makes it 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. For higher strengths Renderoc HB70 should be used.

Renderoc HB40 is suitable for use with Galvashield incipient anode protection and Cathodic Protection system. Contact Fosroc for further details.

Advantages

- Compatible with concrete strength in the range 30 to 45MPa
- Abrasion resistant - suitable for aggressive environments
- Shrinkage compensated - provides long term dimensional stability
- Low permeability to potentially damaging water, CO_2 and chloride ions
- Suitable for use with Galvashield anodes
- Can be applied using wet-spray process - providing faster high build repairs
- Pre-bagged to overcome site-batched variations - only the site addition of clean water required
- Complies to AS 4020:2018 - suitable for use in potable water
- RCS (Respirable Crystalline Silica) Hazard Free*

Standard Compliance

Renderoc HB40 complies to AS 4020:2018.

AS1530.3-1999 Methods for Fire Test on Building Materials

Ignitability Indicies:	0
Spread of Flame Index:	0
Heat Evolved Index:	0
Smoke Developed Index:	0-1

Copies of the test reports are available from the Fosroc website.

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 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 HB40 is classified not hazardous for RCS in accordance with Australian Inventory of Industrial Chemicals; contains <0.1% RCS.

Design Criteria

Renderoc HB40 exhibits a series of performance characteristics designed to achieve maximum compatibility with concrete with a compressive strength greater than 30MPa. It is capable of being hand applied up to 40mm thick and wet spray applied up to 110mm thick in vertical applications.

Application Instructions

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 up to the sawn edge and 20mm behind any exposed reinforcement steel.

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 paying particular attention to the back of exposed steel bars. Abrasive-blasting or high pressure water 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. (If Galvashield anodes are to be embedded into the Renderoc HB40 patch repair, refer to current Galvashield Technical Data Sheet for priming instructions).

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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	Standard	EN 1504 R3 Requirement	Test Result	
Compressive Strength	EN 12190:1999 AS 1478.2 - 2005	≥ 25 MPa -	38 MPa @28 days 10 MPa @ 1 day 25 MPa @ 7 days 35 MPa @ 28 days	
Bond strength by pull off	EN 1542:1999	≥ 1.5 MPa	without primer	1.8 MPa
			Nitobond HAR primer	2.5 MPa
Chloride ion Content	EN 1015-17:2000	≤ 0.05%	0.004%	
Capillary Absorption	EN 1307:2002	≤ 0.5 Kg/(m² x $h^{0.5}$)	0.2 Kg/(m² x $h^{0.5}$)	
Carbonation Resistance	EN 13295:2005	d ≤ref concrete	Conform	
Coefficient of thermal expansion	EN 1770:1990	Declared Value	13.7 x 10^{-6} /°C	
Shrinkage and Expansion	EN 12617-4:2002	> 1.5 MPa	Shrinkage: 1.7 MPa Expansion: 1.7 MPa	
Elastic Modulus	EN 13412:2008	> 15 GPa	18.4 GPa	
Chloride Diffusion	Nordtest NT Build 443	-	4.47 x 10^{-12} m²/sec	
VOC content	ASTM D3960-5	-	13g / litre	
Flexural Strength	AS 1012.11 - 2000	-	5.8 MPa @ 28 days	
Tensile Strength	AS 1012.10 - 2000	-	3.1 MPa @ 28 days	
Setting Time	AS 1012.18 - 1996	-	Initial Set: 3 hours Final Set: 5 hours	
Fresh Wet Density		-	1780 Kg/m³	
Drying Shrinkage (25 x 25 x 285) prisms @ 23°C, 50% RH)	AS 1478.2 - 2005	-	< 400 microstrains @ 7 days < 600 microstrains @ 28 days	
Alkali reactive particles	RTA Rapid Mortar Bar Test RTA T363	-	<0.1% (Non-Reactive)	
Build Characteristics achievable in a single layer			Hand/Trowel	Wet Spray
Overhead	-	-	up to 30mm	60-85mm
Vertical	-	-	up to 40mm	70-110mm

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

Substrate priming

The substrate should be thoroughly soaked with clean water and any excess removed prior to applying one coat of Nitobond HAR primer and scrubbing it well into the surface. 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. Scrubbing by hand a thin layer of the Renderoc into the tacky primer will assist adhesion and also minimise the chance of the primer drying out.

If the Nitobond HAR primer dries before the application of the Renderoc, the area must be re-primed before proceeding.

In exceptional circumstances, e.g. where a substrate/repair barrier is required or where the repair/substrate is likely to become immersed, permanently wet or damp subsequent to the completion and cure of the repair, Nitobond EP bonding aid should be used. Refer to the Nitobond EP data sheet.

Note: Nitobond HAR primer is generally not required when wet spraying Renderoc HB40. Refer to the separate information document “Wet Spraying Renderoc mortars” available from Fosroc.

Note: When Renderoc HB40 is used in conjunction with Impressed Current Cathodic Protection, the substrate bonding primer should be an OPC: Water slurry mixed at a 2:1 ratio. Polymer bonding agents should not be used. No steel primer should be applied. Please refer to Fosroc for further advice.

Mixing

Care should be taken to ensure that Renderoc HB40 is thoroughly mixed. A forced-action mixer is essential. Mix for 3 to 5 minutes at a slow speed (400/500rpm) in a suitably sized drum using appropriate equipment such as a 120/140mm helical mixing paddle fitted to a heavy-duty 1600W mixer.

Free-fall mixers (cement mixers) must not be used.

For normal applications, place 3.0 - 3.2 litres of drinking quality water into the mixer and, with the machine in operation, add 1 full 20kg bag of Renderoc HB40 and mix for 3 - 5 minutes until fully homogeneous. Note that the powder must always be added to the water. Initially add 3.0 litres of water, mix the product for a minimum 3 minutes to allow the polymers in the mix to activate; then make any necessary water adjustments after this time up to the maximum 3.2 litres.

Mixing part bags

It is recommended that full bags be mixed, however for applications where smaller quantities of product are required, experienced applicators may elect to mix half bags by weighing out 10kg of Renderoc HB40 and mixing with half the recommended quantity of water. In doing so the contractor accepts the risk of any off-ratio mixing. Agitate the dry product before weighing out to minimise any segregation. Reliable scales should be used to weigh out individual components.

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 40mm thickness in vertical locations and up to 30mm 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 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 re-primed 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.

The surface of the intermediate layers should be 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.

Wet 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 the wet spray technique, including selection of spraying machines and nozzles, consult the document “Wet Spraying Renderoc mortars” or contact Fosroc.

Finishing

Renderoc HB40 is finished by striking off with a straight edge and closing with a steel trowel. Wooden or plastic floats, or damp sponges may be used to achieve desired surface texture. The completed surface should not be overworked. Allow the applied Renderoc to stiffen before attempting to finish off - this will minimise slumping. After spray application, the mortar may need to be ‘cut back’ to the required profile using a steel trowel and then finished with damp sponges as described above.

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 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 or Concure A99, 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 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.

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Overcoating with protective decorative finishes

Renderoc HB40 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 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 Fosroc 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 following the removal of **any** curing membranes prior to the application of Dekguard system to allow penetration of the silane primers.

When applying other decorative coating systems over curing compounds independent adhesion tests of the primer is recommended. Solvent based primers may compromise the curing compound.

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 Solvent 10.

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, it should not be used in areas subjected to traffic. Neither should it be exposed to moving water during application. Exposure to heavy rainfall prior to final set may result in surface scour. If any doubts arise concerning temperature or substrate conditions, contact Fosroc for advice.

NOTE: Renderoc HB40 is not designed to be used as a broad-scale building render. For large scale areas of repair please contact Fosroc for further advice.

Supply

Renderoc HB40 20kg:	FC302020-20KG
Nitoprime Zincrich 1 litre:	FC322100-1L
Concure A99 20 litre:	FC600909-20L
Nitobond AR 5 litre:	FC320015-5L
Nitobond AR 20 litre:	FC320015-20L
Nitobond HAR 1 litre:	FC322070-1L
Nitobond HAR 5 litre:	FC322070-5L
Nitobond HAR 20 litre:	FC322070-20L
Nitobond EP base 1.5 litre pack:	FC321025-1L
Nitobond EP hdnr 1.5 litre pack:	FC321026-500ML
Nitobond EP base 6 litre pack:	FC321025-4L
Nitobond EP hdnr 6 litre pack:	FC321026-2L
Fosroc Solvent 10 4 litre:	FC600800-4L
Fosroc Solvent 10 20 litre:	FC600800-20L

Coverage and yield

Renderoc HB40:	12.3 litres / 20 kg bag (mid water)
Nitoprime Zincrich:	8 m²/litre
Concure A99:	5 m²/litre
Nitobond AR:	6 - 8 m²/litre
Nitobond HAR:	3 - 4 m²/litre
Nitobond EP:	4 - 5 m²/litre

Note: 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

Renderoc HB40 has a shelf life of 36 months from date of manufacture if kept in the original, unopened bags. Do not use if there are lumps in the product, or a loss of workability (requiring more water to be added) is experienced.

If stored at high temperatures and/or high humidity conditions the shelf life may be reduced.

Important notice

A Safety Data Sheet (SDS) is available from the Fosroc website. Read the SDS and TDS carefully prior to use as application or performance data may change from time to time. In emergency, contact any Poisons Information Centre (phone 13 11 26 within Australia) or a doctor for advice.

Product disclaimer

This Technical Data Sheet (TDS) summarises our best knowledge of the product, including how to use and apply the product based on the information available at the time. You should read this TDS carefully and consider the information in the context of how the product will be used, including in conjunction with any other product and the type of surfaces to, and the manner in which, the product will be applied. Our responsibility for products sold is subject to our standard terms and conditions of sale. Parchem does not accept any liability either directly or indirectly for any losses suffered in connection with the use or application of the product whether or not in accordance with any advice, specification, recommendation or information given by it.

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