Fosroc®
Renderoc HB70 (new improved)

constructive solutions

High performance high strength, concrete patch repair mortar conforming to the requirements of EN 1504-3 Class R4

Uses

For the reinstatement of localised patch repairs and larger areas where suitable reinforcement is incorporated.

Renderoc HB70 is alkaline in nature and will protect embedded steel reinforcement. It is specifically designed for locations where high build and high compressive strengths are required or in locations where good abrasion resistance is necessary. The mortar is suitable where resistance is required to chlorides and carbon dioxide.

Advantages

- High strength and high abrasion resistance
- Compatibility with concrete compressive strengths >45MPa
- Capable of achieving high-build and thereby saving time and expense of multiple applications and reduces the need for formwork
- Sustainable product with lower carbon foot print due to formulation based on supplementary cementitious materials
- Can be applied by the wet spray process for fast, exceptionally high-build repairs with enhanced strength
- Extremely low permeability provides maximum protection against carbon dioxide and chlorides
- Excellent bond to the SSD concrete substrates – no separate primer required in most circumstances
- Shrinkage compensated
- Pre-bagged to overcome site-batched variations - only the site addition of clean water required
- Contains no chloride admixtures

Description

Renderoc HB70, a concrete repair 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, high strength repair mortar.

The material is based on the latest advances in cement, fillers and chemical additives technology and is polymer modified to provide a mortar with good handling characteristics, while minimising water demand.

The hardened product exhibits excellent thermal compatibility with concrete and outstanding water repellent properties. The low water requirement ensures fast strength gain and longterm durability.

Design criteria

Renderoc HB70 has been specifically engineered for vertical and overhead repair work. It can be applied in sections up to 100 mm thickness in vertical locations and up to 80 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.

Build can be dramatically increased by wet spraying. Typical achievable thicknesses are up to 80 - 150 mm vertically and up to 80 - 100 mm overhead, although this will depend on substrate profiles and the distribution of steel reinforcement. Consult your local Parchem sales office for further information.

The material should not be applied at less than 5 mm thickness.

Technical support

Parchem offers a comprehensive range of high quality, high performance construction products. In addition, Parchem offers technical support and on-site advice to specifiers, end-users and contractors.

Specification clause

The repair mortar shall be Renderoc HB70 a one component polymer modified high build cementitious mortar conforming to the requirements of BS EN 1504-3 Class R4.

The cured mortar shall achieve a compressive strength of 70MPa at 56 days and a drying shrinkage of <400 microstrain at 7 days and <600 microstrain at 28 days; Flexural Strength >7 MPa and Indirect Tensile Strength >5 MPa.

Fosroc®
Renderoc HB70 (new improved)

Properties

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

Test Method	Standard	EN 1504 R4 Requirement	Test Result	
Compressive Strength	EN 2190:1999 AS 1478.2 - 2005	≥ 45 MPa	15 MPa @ 1 day 45 MPa @ 7 days 60 MPa @ 28 days 70 MPa @ 56 days	
Flexural Strength	AS 1012.11-2000		7.5 MPa @ 28 days	
Indirect Tensile Strength	AS 1012.10-2000		5.3 MPa @ 28 days	
Bond strength by pull off	EN 1542:1999	≥ 2.0 MPa	Without primer	3.1 MPa
Chloride ion content	EN 1015-17:2000	≤ 0.05%	0.01%	
Capillary Absorption	EN 13057:2002	≤ 0.5 Kg/(m² x $h^{0.5}$)	0.1 kg/(m² x $h^{0.5}$)	
Carbonation Resistance	EN 13295:2005	d ≤ref concrete	Conform	
Coefficient of thermal expansion	EN 1770:1990	Declared Value	14.8 x 10^{-6} /°C	
Shrinkage and Expansion	EN 12617-4:2002	> 2.0 MPa	Shrinkage: 3.1 MPa Expansion: 3.0 MPa	
Elastic Modulus	EN 13412:2008	> 20 GPa	26.9 GPa	
Chloride Diffusion	Nordtest NT Build 443		1.2 x 10^{-12} m²/sec	
Electrical Resistivity	AASHTO TP 95:2014 (50 mm Probe Spacing)		266,000 ohm.cm @ 28 days 563,000 ohm.cm @ 56 days	
Setting Time	AS 1012.18 - 1996		Initial Set: 4 hours, Final Set: 8 hours	
Fresh Wet Density			2000 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 single layer **Vertical** **Overhead**			Hand/trowel up to 100mm up to 80mm	Wet spray 80 - 150mm 80 - 100mm

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 or cut back the extremities of the repair locations to a depth of at least 5mm to avoid feather-edging and to provide a square edge. Break out the complete repair area to a minimum depth of 5mm 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 grit-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. Grit-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 grit-blasting to remove corrosion products from pits and imperfections within its surface.

Reinforcing steel priming

Where a reinforcement coating is required as an active corrosion protection barrier, apply one full coat of Nitoprime Zincrich and allow to dry before continuing.

Substrate priming

The concrete substrate should be saturated surface dry immediately before the application of the Renderoc HB70. Any residual surface water removed prior to applying Renderoc Renderoc HB70.

The surface shall not be allowed to dry before application of Renderoc HB70. Under severe drying conditions repeated soaking may be necessary to ensure the substrate is still saturated at the time of application of the repair mortar.

For improved build thicknesses apply one coat of Nitobond HAR with the Renderoc HB70 applied whilst the primer is still tacky. If the Nitobond HAR primer dries before the application of the Renderoc HB70 it must be re-primed before proceeding.

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.

Mixing Renderoc HB70

Care should be taken to ensure that Renderoc HB70 is thoroughly mixed. A forced-action mixer is essential. Mixing at a slow speed (400/500 rpm) in a suitably sized drum using appropriate equipment such the Ransom 140 x 600 M14 Helical mixing paddle (product code: MH-MDR59) fitted to a heavy-duty 1600W mixer, such as Ransom 1602 E (product code: MH-EV160E) or equivalent is acceptable for one-bag mixes. Free-fall mixers must not be used.

For normal applications, place 2.8 - 3.0 litres of drinking quality water into the mixer and, with the machine in operation, add half the 20kg bag of Renderoc HB70 and mix for 30 seconds then gradually add the remaining powder and mix for a further3 to 4 minutes until fully homogeneous. Dependent on the ambient temperature and the desired consistency, a small additional amount of water may be added up to a maximum total water content of 3.0 litres per 20kg bag of Renderoc HB70.

Note: In all cases Renderoc HB70 powder must be added to water.

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 powder 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 HB70 to the prepared substrate by gloved hand or trowel. First, work a thin layer of the mortar into the primer or presoaked substrate and then build the mortar on to this layer.

Thoroughly compact the mortar on to the primed substrate and around the exposed reinforcement. Renderoc HB70 can be applied in sections up to 100 mm thickness in vertical locations and up to 80 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.

If sagging occurs during application, the Renderoc HB70 should be completely removed and reapplied at a reduced thickness on to the correctly reprimed substrate.

Note: the minimum applied thickness of Renderoc HB70 is 5 mm.

Build-up

Additional build-up can be achieved by application of multiple layers. The surface of the intermediate layers should be comb scratch-keyed. Repriming with Nitobond HAR and a further application of Renderoc HB70 may proceed as soon as this layer has set.

Spray application

Renderoc HB70 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 denser 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 your local Parchem sales office.

Finishing

Renderoc HB70 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 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 HB70 is a cement-based repair mortar. In common with all cementitious materials, Renderoc HB70 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 Renderoc in a continuous film, is recommended. Large areas should be cured as trowelling progresses (0.5m^2 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 HB70 is extremely durable and will provide excellent protection to the embedded steel reinforcement within the repaired locations. The surrounding parts of the structure will generally benefit from the application of a protective 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.

Parchem recommend the use of the Emer Clad and 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. All traces of form-release oils and curing membranes must be removed prior to the application of Dekguard products. This is best achieved by light grit or sand-blasting.

Cleaning

Renderoc HB70, Nitobond HAR, Nitobond AR and Concure A99 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 should be cleaned with Solvent 10.

Limitations

Due to the lightweight nature of Renderoc HB70, the product should not be used in areas subjected to traffic nor exposed to moving water during application. Exposure to heavy rainfall prior to the final set may result in surface scour.

NOTE: Renderoc HB70 is not designed to be used as a broad-scale building render.

Renderoc HB70 is not suitable for repairs where Galvashields are being used.

Estimating

Supply

Renderoc HB70:	20 kg bag
Material code:	FC300747-20KG
Nitoprime Zincrich:	1 litre can
Nitobond AR:	5 & 20 litre drums
Nitobond HAR:	1, 5 & 20 litres drums
Nitobond EP:	1.5 & 6 litre packs
Fosroc Solvent 10:	4 and 20 litre cans

Coverage and yield

Renderoc HB70:	11.5 litres per 20 kg bag
Nitoprime Zincrich:	8 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.

Shelf life

Renderoc HB70 has a shelf life of 24 months from date of manufacture if kept in a dry store in the original, unopened bags or packs. Refer to the Use by Date indicated on the packaging.

Storage conditions

If stored at high temperatures and/or high humidity conditions the shelf life may be reduced to 4 to 6 months.

Nitobond HAR and Nitobond AR to be protected from frost.

Parchem Construction Supplies Pty Ltd
7 Lucca Road, Wyong NSW 2259
Phone: 1300 737 787
www.parchem.com.au
ABN 80 069 961 968

Distributed in New Zealand by: Concrete Plus Ltd
23 Watts Rd, Sockburn 8042 Ph: 0800 657 156