Fosroc®
Renderoc® HB70

constructive solutions

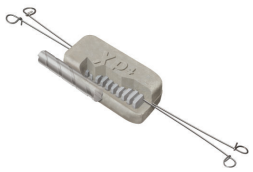
High strength, shrinkage compensated repair mortar suitable for use with embedded galvanic anodes

Uses

For the reinstatement of localised patch repairs and larger areas of reinforced concrete. Renderoc HB70 is alkaline in nature and will protect embedded steel reinforcement. It is specifically designed for locations where 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.

Where compatibility with lower strength concrete is required, Renderoc HB25 or Renderoc HB40 should be considered.

Renderoc HB70 is suitable for use with Galvashield anode protection and Cathodic Protection systems. Contact Fosroc for further details.



Advantages

- Compatible with concrete strength > 45MPa
- High strength - suitable for structural repairs
- 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/NZS4020:2018 - suitable for use in potable water
- RCS (Respirable Crystalline Silica) Hazard Free*

Standard Compliance

Renderoc HB70 complies to AS 4020:2018 at an exposure level of 15,000mm² per litre; AWQC Report 311761.

Copies of the report are available on the Fosroc website.

Description

Renderoc HB70 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 Portland cement, graded aggregates, special fillers and chemical additives 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 long-term durability.

*Renderoc HB70 is classified not hazardous for RCS in accordance with Australian Inventory of Industrial Chemicals; contains <0.1% RCS.

Design Criteria

Renderoc HB70 is designed for vertical or horizontal use. It can be applied up to 40mm thickness in vertical sections. Greater thickness can be achieved in small pockets or by the use of formwork. In horizontal locations, Renderoc HB70 can be applied up to 150mm thickness. Thicker sections can be built up in layers. The material should not be applied at less than 5mm thickness. Thicknesses greater than those nominated in large areas can be achieved by spray application.

Application Instructions

Preparation

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

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Properties

The following results were obtained at a water:powder ratio of 0.14 and temperature of 20°C unless otherwise stated.

Test Method	Standard	EN 1504 R4 Requirement	Test Result	
Compressive Strength	EN 12190:1999 AS 1478.2 - 2005	≥ 45 MPa -	68.2 MPa @28 days 20 MPa @ 1 day 55 MPa @ 7 days 70 MPa @ 28 days	
Bond strength by pull off	EN 1542:1999	≥ 2.0 MPa	Without primer	2.4 MPa
			Nitobond HAR primer	2.7 MPa
Chloride ion Content	EN 1015-17:2000	≤ 0.05%	0.002%	
Capillary Absorption	EN 1307:2002	≤ 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	11.2 x 10^{-6} /°C	
Shrinkage and Expansion	EN 12617-4:2002	> 2.0 MPa	Shrinkage: 2.5 MPa Expansion: 2.5 MPa	
Elastic Modulus	EN 13412:2008	> 20 GPa	33.8 GPa	
Chloride Diffusion	Nordtest NT Build 443	-	1.26 x 10^{-12} m²/sec	
VOC content	ASTM D3960-5	-	12g / litre	
Flexural Strength	AS 1012.11 - 2000	-	6.4 MPa @ 28 days	
Tensile Strength	AS 1012.10 - 2000	-	4.7 MPa @ 28 days	
Setting Time	AS 1012.18 - 1996	-	Initial Set: 3 hours, 15 mins Final Set: 4 hours, 30 mins	
Fresh Wet Density		-	2200 Kg/m³	
Drying Shrinkage (25 x 25 x 285) prisms @ 27oC, 55% 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 (Vertical):	Hand/Trowel up to 40mm		Wet Spray 70-110mm	

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

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 XP are to be embedded into the Renderoc HB70 patch repair, refer to the current Galvashield XP Technical Data Sheet for priming instructions).

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 HB70 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 HB70 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 HB70. Refer to the separate information document “Wet Spraying Renderoc mortars” available from Fosroc.

NOTE: When Renderoc HB70 is used in conjunction with Impressed Current Cathodic Protection or Norcure Realkalisation and Desalination methods, 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 HB70 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 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 1 full 20kg bag of Renderoc HB70 and mix for 3 - 5 minutes until fully homogeneous. Note that powder must always be added to water. Dependent on the ambient temperature and the desired consistency, the amount of water required may vary slightly but should not exceed 3.0 litres / 20kg bag of Renderoc HB70.

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 (the correct quantity of product) 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. Thoroughly compact the mortar on to the primed substrate and around the exposed reinforcement. Renderoc HB70 can be applied up to 40mm thickness in vertical sections but greater thickness in smaller pockets or with the use of formwork. If formwork is used, it should have properly sealed faces to ensure that no water is absorbed from the repair material. In horizontal locations, Renderoc HB70 can be applied up to 150mm thickness.

If sagging occurs during application to vertical surfaces, 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 5mm.

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 lightly scratch-keyed and cured with Nitobond AR. 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 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 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 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 not be used as this will cause premature setting.

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 (0.5m² 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 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. Fosroc recommend 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 AR, Concure A99 and Renderoc HB70 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 10.

Limitations

Renderoc HB70 should not be used when the temperature is below 5°C and falling. Do not mix part bags. The product should not 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, contact Fosroc.

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

Supply

Renderoc HB70 20kg:	FC303030-20KG
Nitoprime Zincrich 1 litre:	FC322100-1L
Concure A99 20 litre:	FC600909-20L
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 HB70:	10.4 litres / 20 kg bag (mid water)
Nitoprime Zincrich:	8 m^2 / litre
Concure A99:	5 m^2 / litre
Nitobond HAR:	3 - 4 m^2 / litre
Nitobond AR:	6 - 8 m^2 / litre
Nitobond EP:	4 - 5 m^2 / litre

Note: the actual yield per bag of Renderoc HB70 will depend on the consistency used. The yield will be reduced if the material is applied by a spray technique. 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 HB70 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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