Fosroc® Renderoc® HB70 Plus

constructive solutions

High strength, high build, high resistivity, shrinkage compensated repair mortar conforming to EN1504-3 Class R4

Uses

For the reinstatement of concrete where low permeability, high compressive strength and high resistivity characteristics are key requirements.

Renderoc HB70 Plus has been specifically developed for vertical and overhead repair work where its lighter weight nature and high build characteristics make it ideal.

Renderoc HB70 Plus achieves 70MPa @ 56 days. If lower compressive strength is required for compatibility with host concrete, Renderoc HB40 Plus should be considered.

Renderoc HB70 Plus is not suitable for repairs where Galvashield anodes are being used - Renderoc HB70 should be considered.

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
- High build formulation - fewer applications of product
- High resistivity - provides increased durability
- Excellent bond to SSD concrete substrates – no separate primer required in most circumstances - refer to Substrate Priming section
- 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
- Sustainable product with lower carbon foot print - formulation based on supplementary cementitious materials
- Complies to EN 1504-3 Class R4
- Complies to AS/NZS4020:2018 - suitable for use in potable water
- RCS (Respirable Crystalline Silica) Hazard Free*

Standard Compliance

Renderoc HB70 Plus complies to AS 4020:2018 at an exposure level of 15,000mm² per litre; AWQC Report 326452.

Copies of the report are available on the Fosroc website.

Description

Renderoc HB70 Plus, 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.

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

Design criteria

Renderoc HB70 Plus has been specifically engineered for vertical and overhead repair work. It can be applied in sections up to 100mm thickness in vertical locations and up to 80mm 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 - 150mm vertically and up to 80 - 100mm overhead, although this will depend on substrate profiles and the distribution of steel reinforcement. Contact Fosroc for further information.

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

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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 12190:1999 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
VOC content			9g / litre
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		Hand/trowel	Wet spray
Vertical		up to 100mm	80 - 150mm
Overhead		up to 80mm	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 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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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 Plus. Any residual surface water removed prior to applying Renderoc Renderoc HB70 Plus.

The surface shall not be allowed to dry before application of Renderoc HB70 Plus. 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 Plus applied whilst the primer is still tacky. If the Nitobond HAR primer dries before the application of the Renderoc HB70 Plus it 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.

Mixing Renderoc HB70 Plus

Care should be taken to ensure that Renderoc HB70 Plus is thoroughly mixed. A forced-action mixer is essential. Mix for 3 to 5 minutes at a slow speed (400/500 rpm) 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 half the 20kg bag of Renderoc HB70 Plus 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 Plus.

Note: In all cases Renderoc HB70 Plus 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 Plus 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 Plus 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 Plus should be completely removed and reapplied at a reduced thickness on to the correctly reprimed substrate.

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

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 Plus may proceed as soon as this layer has set.

Spray application

Renderoc HB70 Plus 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 Fosroc.

Finishing

Renderoc HB70 Plus 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 Plus is a cement-based repair mortar. In common with all cementitious materials, Renderoc HB70 Plus must be cured immediately after finishing in accordance with good concrete practice. The use of 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 Plus 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.

Cleaning

Renderoc HB70 Plus, Nitobond HAR 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 Fosroc Solvent 10.

Limitations

Due to the lightweight nature of Renderoc HB70 Plus, 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 Plus is not designed to be used as a broad-scale building render.

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

Supply

Renderoc HB70 Plus 20kg:	FC303035-20KG
Nitoprime Zincrich 1 litre:	FC322100-1L
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
Concure A99 20litre:	FC600909-20L
Fosroc Solvent 10 4 litre:	FC600800-4L

Coverage and yield

Renderoc HB70 Plus:	11.5 litres / 20kg bag (mid water)
Nitoprime Zincrich:	8m²/litre
Nitobond HAR:	3 - 4m²/litre
Concure A99:	5m²/litre
Nitobond EP:	4 - 5m²/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 HB70 Plus 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.

Nitobond HAR and Concure A99 to be protected from frost.

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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Parchem Construction Supplies Pty Ltd
1956 Dandenong Rd Clayton VIC 3168
Ph: 1800 812 864
www.fosroc.com.au ABN 80 069 961 968

Distributed in New Zealand by: Concrete Plus Ltd
150 Hutt Park Road Gracefield Ph: 0800 657 156
www.fosroc.co.nz NZBN 9429033691282