Fosroc® Renderoc HB70

Technical Data Sheet

High performance, high strength, very low shrinkage, patch repair mortar

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.

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.

Technical Support

Parchem offers a technical support service to specifiers, end-users and contractors, as well as on-site technical assistance.

Advantages

- High strength and high abrasion resistance
- High build repairs
- Exceptional system of shrinkage compensation, provides long-term dimensional stability
- Low permeability provides sound protection against carbon dioxide and chlorides
- Can be applied by the wet or dry spray process for fast, exceptionally high build repairs with enhanced characteristics
- Suitable for internal and external use
- Pre-bagged to overcome site-batched variations - only the site-addition of clean water required
- Contains no chloride admixtures
- Potable water approved - complies to AS/NZS 4020:2005
- Maximum compatability with concrete of compressive strengths >45 MPa

Design Criteria

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

Specification Clause

The polymer modified shrinkage-compensated reinstatement mortar shall be Renderoc HB70 a single- component cement-based blend of powders to which only the site-addition of clean water shall be permitted. The cured mortar shall achieve 70 MPa compressive strength and 10 MPa flexural strength at 28 days.

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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 2190:1999 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 h0.5)	0.1 Kg/(m² x h0.5)	
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	
Modulus of Elasticity in Compression	AS1012.17:1997	-	3.65 x 104 MPa	
Chloride Diffusion	Nordtest NT Build 443	-	1.26 x 10^{-12} m²/sec	
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)	
Chemical Resistance			The low permeability of Renderoc HB70 severely retards chemical attack in aggressive environments. The cured mortar is impermeable to acid gases, waterborne chloride ions and oxygen	
Build Characteristics achievable in a single layer			Hand/Trowel	Wet Spray
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.

Application Instructions

Preparation

Saw cut or cut back the extremities of the repair locations to a minimum depth of at least 5 mm to avoid feather-edging and to provide a square edge. Break out the repair area to a minimum depth of 5 mm 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

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 substrate is wet or likely to remain permanently damp, Nitobond EP bonding aid should be used. Contact your local Parchem sales office for further information.

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 Parchem branches.

Mixing

Care should be taken to ensure that Renderoc HB70 is thoroughly mixed. A forced-action mixer is essential. Mixing in a suitably sized drum using an appropriate spiral paddle such the Protool HS2 140 x 600 M14 Helical mixing paddle (product code: TT-614217) or equivalent at a slow speed (400/500 rpm) using a heavy-duty mixer, 1500W such as Protool MXP 1602 E (product code: TT-621941) or equivalent 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 2.8 - 3.0 litres of drinking quality water into the mixer and, with the machine in operation, add 1 full 20 kg 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 / 20 kg bag of Renderoc HB70.

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 40 mm 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 150 mm 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 5 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 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 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 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 (0.5 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

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 Dekguard or Emer-Clad 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 or Emer-Clad 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 or Emer-Clad products.

Cleaning

Nitobond AR 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 Parhem Solvent.

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, consult your local Parchem office.

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

Estimating

Supply

Renderoc HB70 product code: 303030

Renderoc HB70:	20 kg bag
Nitoprime Zincrich:	1 litre can
Nitobond HAR:	1, 5 and 20 litre containers
Nitobond AR:	5 and 20 litre containers
Nitobond EP:	1.5 and 6 litre packs
Solvent 10:	4 and 20 litre cans

Coverage and yield

Renderoc HB70:	Approx. 10.2 litres / 20 kg bag (1.0 m² @ 10 mm thickness)
Nitoprime Zincrich:	8 /litre
Nitobond HAR:	3 - 4 m²/litre
Nitobond AR:	6 - 8 m²/litre
Nitobond EP:	4 - 5 m²/pack

Notes: 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.

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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 - 6 months. Nitobond AR should be protected from frost.

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