Technical Data Sheet

Renderoc HB

General purpose, economical, patch repair mortar, polymer modified

USES

For the reinstatement of large areas of concrete and for small, localised patch repairs. Renderoc HB is alkaline in nature and will protect embedded steel reinforcement. It is specifically designed for vertical and overhead high-build applications. The mortar is suitable where medium strength, as well as exceptional chloride and carbon dioxide resistance is required.

Important note: this mortar is approved for use with Norcure realkalisation. When using it in conjunction with this method, the concrete bonding primer should be an OPC: water slurry. Polymer bonding agents should not be used. No steel primer should be applied. Refer to your local Parchem sales office for further advice.

ADVANTAGES

- Lightweight formulation enabling extra high-build and thereby saving time and expense of multiple applications
- Reduces the need for formwork
- 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 concrete substrates
- Shrinkage compensated
- Pre-bagged to overcome site-batched variations - only the site addition of clean water required
- Contains no chloride admixtures

DESCRIPTION

Renderoc HB, a lightweight 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, lightweight repair mortar. The material is based on Portland cement, graded aggregates, lightweight 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.

DESIGN CRITERIA

Renderoc HB can be applied in sections up to 80 mm thickness in vertical locations and up to 50 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 depending on the actual configuration of the pocket and the volume of exposed reinforcing steel.
The material should not be applied at less than 10 mm thickness. Thicknesses generally greater than specified above can be achieved by spray application. Consult your local Parchem sales office for further information.

PROPERTIES

The following results were obtained at a water:powder ratio of 0.18 and temperature of 20°C.

Test method	Typical result
Compressive strength (BS 6319 Pt 2: 1983 - dry cure):	10 MPa @ 1 day 12 MPa @ 3 days 20 MPa @ 7 days 28 MPa @ 28 days
Flexural strength (BS 6319 Pt 3: 1983):	4.5 MPa @ 28 days
Tensile strength (BS 6319 Pt 7: 1985):	1.7 MPa @ 28 days
Water absorption ISAT (BS 1881 Pt 5: 1970)	
- 10 minutes:	0.002 ml/m^2/sec
- 2 hours:	0.001 ml/m^2/sec
Chloride diffusion (Taywood Method):	< 2 x 10^{-10} mm^2/sec

CARBON DIOXIDE BARRIER -

Equivalent thickness of concrete to Renderoc HB @ 10mm (Taywood Method):	800 mm
Equivalent thickness of air to Renderoc HB @ 10 mm (Taywood Method):	320 metres
Coefficient of thermal expansion:	7 - 12 x 10^{-6}/°C
Setting time (BS 4551 Pt 14: 1980)-	
- initial set:	2 hours
- final set:	5 hours
Fire rating (BS 476 Pt 4: 1970):	Non-combustible (Class O surface)
Fresh wet density:	Approximately 1400 kg/m^3 dependent on actual consistency used

SPECIFICATION CLAUSES

STEEL REINFORCEMENT PRIMER

The steel reinforcement primer shall be Nitoprime Zincrich, a single-component zinc-rich epoxy resin. The primer shall be an 'active' type, capable of avoiding the generation of incipient anodes in the immediately adjacent locations. It shall be fully compatible with the Renderoc system of concrete repair.

REPAIR MORTAR

The fibre and polymer modified reinstatement mortar shall be Renderoc HB, 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 a compressive strength of 28 MPa, a flexural strength of 4.5 MPa and a tensile strength of 1.7 MPa at 28 days. Chloride diffusion coefficient shall be not greater than 2 x 10^{-10} cm^2/sec (by the Taywood Method) and a 10 mm section of cured mortar shall provide a carbon dioxide barrier equivalent to not less than 800 mm concrete or 320 metres air (by the Taywood Method).

APPLICATION INSTRUCTIONS

PREPARATION

Saw cut or cut back the extremities of the repair locations to a depth of at least 10 mm to avoid feather-edging and to provide a square edge. Break out the complete repair area to a minimum depth of 10 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.

SUBSTRATE PRIMING

The substrate should be thoroughly soaked with cleanwater and any excess removed prior to applying one coat of Nitobond HAR primer and scrubbing it well into the surface.

Renderoc HB to be applied as soon as the primer becomes tacky. If the Nitobond HAR* is too wet, overhead and vertical build up of the Renderoc HB mortar may be difficult.

If the primer is allowed to dry, the surface must be reprimed with Nitobond HAR.

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.

MIXING

Care should be taken to ensure that Renderoc HB is thoroughly mixed. A forced-action mixer is essential. Mixing in a suitably sized drum using an approved spiral paddle in a slow speed (400/500 rpm) heavy-duty drill 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 2.6 litres of drinking quality water into the mixer and, with the machine in operation, add one full 15 kg bag of Renderoc HB and mix for 3 to 5 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 2.7 litres per 15 kg bag of Renderoe HB.

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

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 HB to the prepared substrate by gloved hand or trowel. First, work a thin layer of the mortar into the primer and then build the mortar on to this layer. Thoroughly compact the mortar on to the primed substrate and around the exposed reinforcement. Renderoc HB can be applied in sections up to 80 mm thickness in vertical locations and up to 50 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 HB should be completely removed and reapplied at a reduced thickness on to the correctly reprimed substrate.

Note: the minimum applied thickness of Renderoc HB is 10 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 HB may proceed as soon as this layer has set.

SPRAY APPLICATION

Renderoc HB can be 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 greatly enhanced mortar/substrate bond characteristics. For further details on the wet spray technique, including selection of spraying machines and nozzles, consult Fosroc's Wet Spray Application Guide available from your local Parchem sales office.

FINISHING

Renderoc HB is finished by striking off with a straight edge and closing with a steel float. Wooden or plastic floats, or damp sponges may be used to achieve the desired surface texture. The completed surface should not be overworked. Wetting the surface down before set has occurred can cause a white layer to form on the surface of the repair.

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 failing. 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 HB is a cement-based repair mortar. In common with all cementitious materials, Renderoe HB must be cured immediately after finishing in accordance with good concrete practice. The use of Nitobond AR, 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 m^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 HB 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. Emer-Clad and Dekguard 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 Emer-Clad and Dekguard products.

CLEANING

Nitobond HAR, Nitobond AR and Renderoc HB 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 HB should not be used when the temperature is below 5°C and failing. Do not mix part bags. Due to the lightweight nature of Renderoc HB, the product 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 the final set may result in surface scour. If any doubts arise concerning temperature or substrate conditions, consult your local Parchem sales office.

ESTIMATING

SUPPLY

Renderoc HB:	15 kg bag
Nitoprime Zincrich:	1 litre can
Nitbond HAR:	1, 5 and 20 litre containers
Nitobond AR:	1, 5 and 20 litre containers
Nitobond EP:	1, 5 and 6 litre packs
Solvent 10:	4 and 20 litre cans

COVERAGE AND YIELD

Renderoc HB:	12.1 - 12.5 litres/15 kg bag (approximately 1.25 m^2 at 10 mm thickness)
Nitoprime Zincrich:	7 m^2/litre (approx.)
Nitoprime HAR:	3 - 4 m^2/litre (approx.)
Nitobond AR:	6 - 8 m^2/litre
Nitobond EP:	4 - 5 m^2/litre

Note: the actual yield per bag of Renderoc HB 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.

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 to 6 months. Nitobond HAR and Nitobond AR should be protected from frost.

ADDITIONAL INFORMATION

Parchem provides a wide range of complementary products which include:

- concrete repair – cementitious and epoxy
- grouts and anchors – cementitious and epoxy
- waterproofing membranes – liquid applied, cementitious and bituminous sheet membranes
- waterstops – pvc and swellable
- joint sealants – building, civil and chemical resistant
- industrial flooring systems – cementitious and epoxy
- architectural coatings
- filler boards – swellable cork, bituminous and backing rod
- ancillary products

For further information on any of the above, please consult with your local Parchem sales office.

IMPORTANT NOTICE

A Material Safety Data Sheet (MSDS) and Technical Data Sheet (TDS) are available from the Parchem website or upon request from the nearest Parchem sales office. Read the MSDS 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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