

## Renderoc HB25

**High performance, light-weight, very low shrinkage, patch repair mortar, compatible with concrete 15-30 MPa**

### SECTION A: GENERAL COMMENTS

#### HIGH AND LOW TEMPERATURE WORKING

It is suggested that, for temperatures above 35°C or below 5°C, the following guidelines are adopted as good working practise:

- I. Store unmixed materials in cool, dry conditions, in original unopened bags, avoiding exposure to direct sunlight.
- II. In high temperature environments, keep equipment cool, arranging shade protection if necessary. It is especially important to keep cool those surfaces of the equipment that come into direct contact with the material itself.
- III. Try to avoid application during the hottest times of the day, arrange temporary shading as necessary.
- IV. At lower temperatures, *Renderoc HB25* should be applied only when the substrate temperature and the ambient temperature is above 5°C or 5°C and rising.
- V. Make sufficient material, plant and labour available to ensure that application is a continuous process.

#### EQUIPMENT

It is suggested that the following list of equipment is adopted as a minimum requirement for the correct application of this material:

- Protective clothing :
- Protective overalls, safety helmet and safety shoes
  - Good quality gloves, goggles and face-mask
- Preparation equipment :
- Marker chalk or pen
  - Disc saw
  - Electric or pneumatic concrete breaker
  - Wire brush
  - Proprietary grit blasting equipment or high pressure washer
- Mixing equipment :
- Measuring jug
  - Festo slow speed drill, 400-500 rpm
  - + Parchem mortar mixing paddle
  - + Parchem 20 litre mixing pail, or proprietary forced-action mixer for multiple bag mixing
- Application equipment :
- Hand application trowel
  - Wooden float
  - Steel or plastic finishing float
  - Finishing sponge

## APPLICATION – POINTS OF NOTE

Parchem operates a policy to encourage the use, where possible, of experienced applicators, since the long-term performance of the materials is dependant upon proper application. For contractors who wish to apply the materials themselves, Parchem is also able to offer technical assistance.

## SECTION B: APPLICATION METHOD

### 1.0 REPAIR AREAS

- 1.1 The areas to be repaired are to be as shown on the drawings or as indicated by the Contract Administrator. The areas are to be clearly marked out on site and agreed with the Contract Administrator before proceeding.
- 1.2 As the work proceeds, repair areas may be adjusted by the Contract Administrator, according to the conditions found.
- 1.3 Propping shall be provided as noted on the drawings or as agreed by the Contract Administrator.
- 1.4 The surfaces adjacent to and of areas for repair shall be cleaned to remove any dust, unsound material, plaster, oil, paint, grease, corrosion deposits, organic growth, etc.
- 1.5 Within the repair area, the concrete cover to reinforcement links or main bars shall be determined using a cover meter. A small area shall be chiselled out and the concrete cover and the depth of deteriorated concrete confirmed by measurement.

### 2.0 CONCRETE PREPARATION

Attention to full and proper preparation of the substrate is essential for complete repair adhesion.

- 2.1 Break out unsound concrete as defined within the repair zone. Using a saw, disc cutter, or other suitable tool, the perimeter of the area to be repaired shall be incised to a depth of at least 10 mm causing good arises to be formed at the outer edges all to preclude feather edging of the repair mortar.
- 2.2 Where the depth of breaking out corresponds to the depth of concrete cover and thereby exposes reinforcement, breaking out shall continue to expose the full circumference of the steel and to a further depth of 25 mm or as directed by the Contract Administrator. Breaking out shall continue along the reinforcement until non-corroded steel is reached and shall continue 50 mm beyond this point or as directed by the Contract Administrator. Special care shall be exercised to ensure that any reinforcement exposed is not cut or damaged.
- 2.3 All concrete surfaces to receive repair mortar shall be of a rough scabbled nature. Saw/disc cut edges shall be grit blasted to lightly roughen.
- 2.4 This preparation shall be such as to leave a sound exposed concrete substrate free from dust, loose particles and any deleterious matter.

*Additional considerations where concrete is affected by carbonation*

- 2.5 After breaking out as specified the exposed surface of concrete shall be tested for carbonation by the use of a semi-aqueous solution of phenolphthalein. The test shall be carried out on the freshly exposed concrete or at least within 30 minutes of being exposed. The test shall be carried out on sound, dry and clean air-blown dust free surfaces. If the concrete substrate still exhibits carbonation in the vicinity of the steel reinforcement, breaking out to remove a further 20 mm shall be carried out and the test repeated. If carbonation is still present the Contract Administrator shall be notified before proceeding further.
- 2.6 It is essential that no carbonated concrete substrate shall be in contact with, or within 5 mm of, the reinforcing bars. In cases where carbonation has reached within 5 mm of the reinforcing bars, the concrete shall be broken out to expose the full circumference of the steel and a further depth of 20-30 mm or as directed by the Contract Administrator.

## *Additional considerations where concrete is affected by chlorides*

2.7 Where it is determined that chlorides are present in the concrete the agreed area(s) shall be broken out to remove all contaminated concrete, or, having regard to the steel reinforcement, to a depth as directed by the Contract Administrator.

NOTE: Chloride values are generally expressed in percentage terms of weight of chlorides by weight of concrete: 0.05% - 0.15% medium risk; above 0.15% high risk, though where chloride penetration from external sources is involved, the risk of corrosion in the medium risk range is much greater, and corrosion has been found to occur at levels below 0.05%.

## *Reinforcing steel / concrete not affected by carbonation or chlorides*

2.8 Where exposed reinforcement is sound and there are no signs of corrosion other than typical of its original condition it shall be mechanically cleaned of rust and loose mill scale. Where there are signs of corrosion deterioration it shall be cleaned of corrosion products by wet grit blasting or other approved means to achieve a surface finish to comply with a standard of steel cleanliness such as SA 21/2(BS7079: Part A1 / ISO8501) or as directed by the Contract Administrator.

2.9 Reinforcement damaged during the removal of concrete or the preparation process shall be brought to the attention of the Contract Administrator and if required, shall be repaired or replaced.

## *Concrete affected by carbonation and / or chlorides*

2.10 All exposed reinforcement shall be cleaned of corrosion products by wet grit blasting or other approved means to achieve a surface finish to comply with a standard of steel cleanliness such as SA 21/2 (BS7079: Part A1 / ISO8501) or as directed by the Contract Administrator. Special care shall be taken to clean out properly any pitting that may have occurred in the steel bar.

### **3.0 REINFORCEMENT PREPARATION**

3.1 When the corrosion products have been removed and if directed by the Contract Administrator, the diameter of the reinforcing bar(s) shall be measured. If considered necessary by the Contract Administrator the existing reinforcement shall be cut out and replaced and/or additional bars added in accordance with instructions. Any deep pitting of the reinforcing bars shall be brought to the attention of the Contract Administrator.

3.2 Reinforcement damaged during the removal of concrete or the preparation process shall be brought to the attention of the Contract Administrator and if required, shall be repaired or replaced.

### **4.0 ANODE INSTALLATION**

4.1 Where required by specification, *Galvashield XP* anodes shall be installed in accordance with the current Technical Data Sheet and Method Statement. *Renderoc HB25* is suitable for the installation of *Galvashield XP* as it has a Resistivity < 15,000 ohm cm @ 28 days.

### **5.0 REINFORCEMENT PRIMER**

5.1 Immediately following preparation and cleaning, the reinforcing steel shall be primed with *Nitoprime Zincrich*, a single component epoxy primer complying with the relevant parts of BS4652, 1971 (1979) Specification For Metallic Zinc Rich Priming Paint Type 2.

5.2 The *Nitoprime Zincrich* shall be brush applied to the cleaned reinforcement ensuring that all exposed steel is fully coated. Special attention shall be paid to the backs of the steel bars and where steel bars are tied together. It is essential that this coat is continuous with that of any adjacent repaired area where zinc-rich primer has been used. Avoid excessive over-painting onto the concrete and allow to dry.

### **6.0 SUBSTRATE PRIMING**

6.1 For two hours prior to application of the repair mortar the prepared substrate shall be thoroughly wetted with clean water to totally satisfy absorption. Any standing or excess water shall be removed.

6.2 The concrete primer shall be *Nitobond HAR* acrylic emulsion that shall be worked firmly into the damp substrate with a short-bristle brush to achieve a film intimate with the contact area for immediate repair.

6.3 Single repair areas larger than 0.5m<sup>2</sup> shall be part primed to commence and thereafter progressively in maximum 0.5m<sup>2</sup> adjacent bays as application of the repair mortar proceeds.

6.4 The repair mortar shall be applied whilst the *Nitobond HAR* is tacky. If the primer dries before the mortar is applied, the area shall be re-primed once again.

Note: Where *Renderoc HB25* is spray applied, no concrete primer shall be used. However thorough wetting of the surface must take place prior to spraying.

## 7.0 MIXING REPAIR MORTAR

7.1 Before mixing the repair mortar the contractor shall ensure that sufficient and correct areas for reinstatement are prepared and ready to receive repair mortar.

7.2 Only mixes using complete bags of *Renderoc HB25* shall be allowed and part bag mixes not permitted.

7.3 The mixing shall be carried out strictly in accordance with current product instructions for use and only with appropriate mixing equipment.

7.4 The mixing water shall be potable quality and the carefully measured quantity of water 2.6 - 2.8 litres for the required mix shall be placed into the mixing container before the *Renderoc HB25*. The quantity of water used when wet spraying *Renderoc HB25* may be increased to a maximum of 3.0 litres. Consult the local Parchem representative.

7.5 The *Renderoc HB25* shall be added to the mixing water and in no circumstances shall more water be added than the maximum volume stated for each bag when using the hand application method.

The mixing time shall be minimum 3 - 5 minutes to allow for full integration of component parts.

## 8.0 APPLICATION OF REPAIR MORTAR

8.1 Only fully integrated mixes of *Renderoc HB25* at the required consistency and workability shall be used.

8.2 Trowel the mixed mortar to the prepared and primed surface of the substrate paying particular attention to packing behind and between the reinforcement, and thorough compaction overall.

8.3 *Renderoc HB25* shall be applied in accordance with current instructions for use. It may be applied in one operation by building up to the required profile in wet-on-wet layers between 10-80 mm vertically and 10-60 mm overhead. Thicker sections may be achieved by building up in wet-on-dry layers, where each layer shall be wavy-line scratch keyed with a comb, cured with *Nitobond AR*, allowed to dry throughout and reprimed at the time of application of subsequent layers.

8.4 Sagging of the repair mortar is not acceptable and if occurring all the material of the affected repair shall be completely removed prior to repriming and refilling in two or more applications of mortar supported by formwork if required.

8.5 If formwork is used it shall be pre-treated with a varnish to prevent moisture absorption from the repair mortar. Special care shall be taken to ensure that the positioning of the formwork allows for compaction of and does not result in voids within the repair mortar.

8.6 After applying sufficient mortar to achieve a level flush with or slightly proud of the surrounding surface the *Renderoc HB25* shall be finished by striking off with a straight edge and trowelled/floated depending upon circumstances.

8.7 *Renderoc HB25* can also be applied by a dry spray, and a wet spray process. In spray applications where the *Galvashield XP* is to be incorporated into the patch repairs, allow to protect the installed *Galvashield XP* with a hand applied, set encasement mortar of *Renderoc HB25* prior to commencing the spray application.

8.8 The repair mortar shall not be applied when the ambient or substrate temperature is below 5°C or above 35°C nor at an ambient temperature of 5°C on a falling thermometer. The applied repair mortar shall always be protected from freezing whilst drying.

## 9.0 CURING

9.1 Details of the methods of curing shall be submitted to the Contract Administrator for approval.

9.2 Curing techniques shall be instigated immediately following application of repair mortar to any given area. Large areas (0.5m<sup>2</sup> at a time) shall be cured as trowelling progresses without waiting for completion of the whole area.

9.3 *Nitobond AR* may be low-pressure, spray applied as a curing membrane. In fast drying conditions it will be necessary to supplement this with polyethylene sheet taped around its edges. Where a *Dekguard* protective coating is to be applied over the repair area then *Nitobond AR* shall be used as the curing membrane.

9.4 During application and curing, all work shall be protected against direct strong sunlight.

## 10.0 CLEANING

10.1 All equipment should be washed with clean water immediately after use. Cured material can only be removed by mechanical means.

## SECTION C: IMPORTANT NOTE

This method statement is offered by Parchem as a 'standard proposal' for the application of *Renderoc HB25*. It remains the responsibility of the Engineer to determine the correct method for any given application.

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.