# Guardian CRM-LHB

GUARDIAN PROTECTIVE COATINGS

## One Part Light Weight Polymer Modified Repair Mortar For High Build Repairs

**Guardian CRM-LHB** is a ready to use one part light weight repair mortar. Provides excellent thermal compatibility to concrete, waterproof properties and long term durability.
Complies to EN1504 Part 9 and EN1504 Part 3.
**Principle 3 :** Concrete Restoration (CR).

- Method 3.1 - Applying mortar by hand.
- Method 3.3 – Spraying concrete or mortar.

## USES & ADVANTAGES

Specifically designed for vertical and overhead repairs of all sizes where high build is required. Provides excellent durability & resistance to chloride & carbon-dioxide.

**Advantages include:-**

- High build one application.
- Excellent bond.
- Contains shrinkage compensators.
- Low permeability.
- One part & prebagged.
- Can be wet sprayed.
- No formwork required.
- Overhead & vertical repairs made easy.
- Can be applied in sections up to 80 mm.
- Suitable for potable water contact.

## PROPERTIES

| | |
|---|---|
| The following results were obtained at a water : powder ratio of 0.19 and temperature of 25ºC. | |
| **Appearance:** | Grey Powder |
| **Fresh Wet Density:** | Approx. 1,400 kg/m$^3$ depending on actual consistency used. |
| **Setting Time:** | Initial 2.00 hours |
| ASTM C191-01a / ASTM C807 | Final 4.50 hours |
| **Compressive Strength:** | Approx. 26 - 28 N/mm2 |
| ASTM C109 | at 28 days |
| **Carbon Dioxide Barrier 10 mm. of Guardian CRM-LHB:** | |
| Equivalent to 800 mm of concrete | |
| **Chemical Resistance:** | |
| Reduces dramatically chemical attack due to low permeability. Impermeable to acid, gases, water borne chlorides, ions and oxygen. Chloride diffusion is very low. Chloride diffusion < 2 x 10-10 cm2/sec. | |
| **Drying Shrinkage:** | < 400 micro strain at 7 days |
| ASTM C490 | < 580 micro strain at 28 days |
| BS 6319 Part 7 | |
| **Fire Rating:** | Non combustible |
| **Coefficient of Thermal Expansion:** 7 to 12 x $10^{-6}$/ºC | |
| **Water Absorption:** | 10 minutes 0.002 ml/m2/sec. |
| ISAT | 2 hours 0.001 ml/m2/sec. |
| **Chloride Diffusion:** | < 2 x $10^{-10}$ cm$^2$/sec. |
| Tested to BS 6319 Part 2, 6 & 7. | |
| **Pot life:** | 25-35 min @25ºC. |

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## EN REQUIREMENTS

Requirements as per EN 1504-3 Class R3
(Tested at Water : Powder ratio = 15.5%)

| | Test Method | Result | Requirements (R3) |
|---|---|---|---|
| **Compressive Strength** | EN 12190 | >25 N/mm$^2$ (Mpa) | $\geq$ 25 N/mm$^2$ (Mpa) |
| **Chloride Ion Content** | EN 1015-17 | < 0.009 % | $\leq$ 0.05 % |
| **Capillary Absorption** | EN 13057 | 0.11 kg.m$^{-2}$.h$^{-0.5}$ | $\leq$ 0.5 kg.m$^{-2}$.h$^{-0.5}$ |
| **Carbonation Resistance** | EN 13295 | Lower than control | dk $\leq$ control concrete |
| **Adhesive Bond** | EN 1542 | 2.0 N/mm$^2$ (Mpa) | $\geq$ 1.5 N/mm$^2$ (Mpa) |

## APPLICATION INSTRUCTIONS & SURFACE PREPARATION

Saw cut repair area to a depth at least 10 mm. to avoid feather edges. Break out repair area.
Clean surface remove unsound concrete, dust, oil, paint, grease, algae, etc. The surface must be left clean & roughened.
Steel should be cleaned to bright condition & primed using 2 coats of **Guardian Zinc Primer.**
Thoroughly soak the concrete with water prior to applying **Guardian LPA** bonding bridge. Work well into the surface. (Remove excess water before applying the bonding bridge).
Do not allow bonding bridge to dry out work wet on wet. If it dries out remove & reprime. **Guardian LPA** bonding bridge is not required in all circumstances consult Guardian.

## PRIMING

Apply **Guardian LPA** / cement bonding slurry to prepared surface and whilst still tacky apply **Guardian CRM-LHB.**

## MIXING

Ensure thorough mixing in a forced action mixer or with a heavy duty drill (400/500 rpm.). Do not use free fall mixers or part bags.
Use 3.1 litre of clean water. Put the water into the mixer & add an 18 kg bag of **Guardian CRM-LHB**, mix for 3-5 minutes. Always add powder to water. The maximum water content should be 3.25 litre per 18 kg bag.

## APPLICATION

Apply **Guardian CRM-LHB** to the prepared area by hand or trowel. Work a thin layer into the primer then build until the required depth. On vertical & overhead surfaces build may be as high as 50-80 mm. without formwork. If high build is required work in layers. If sagging takes place reapply system including primer. The minimum build for **Guardian CRM-LHB** is 10 mm. Intermediate layers should be scratched keyed & cured with water.

**Spray Application**
**Guardian CRM-LHB** applied by wet spray provides cost saving in terms of less wastage and higher productivity & gives a more dense material.

**Finishing**
Finish with a steel, wooden or plastic float.

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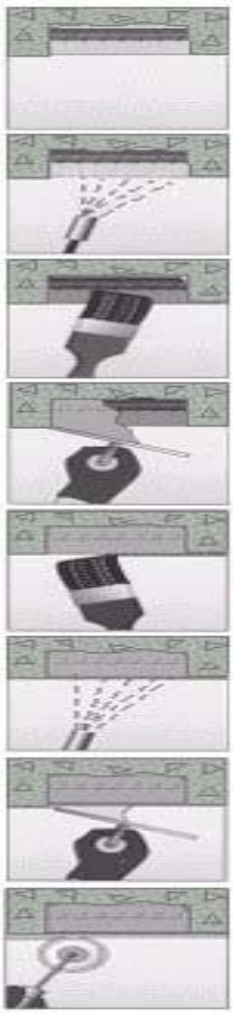
### Typical System for Concrete Repair Using Guardian Repair Mortars



Remove damaged concrete and prepare exposed steel reinforcement.

Thoroughly clean area of repair using high pressure water jet to remove all loose debris and contamination.

Mix and apply **Guardian Zinc Primer** to rebar allow to dry. Apply **Guardian LPA** bonding bridge if required. Apply repair material WET ON WET to bonding bridge.

Replace damaged concrete using **Guardian CRM-LHB** one component polymer modified light weight mortar, build up in layers if necessary.

Once set firm, the repair and surrounding area coat with **Guardian CURE-SW** or **Guardian CURE-S** curing compound.

Remove any remaining **Guardian CURE-SE** from treated area if to overcoat.

Any further leveling may be achieved with fairing material.
A final coat of **Guardian ELATOSHIELD** decorative elastomeric, anti-carbonation coating will prevent the ingress of water chlorides and other aggressive influences, effectively halting the carbonation process. **Guardian ELATOSHIELD** is water vapour permeable, allowing the substrate to breathe, and has excellent elasticity, bridging dynamically moving cracks even at low temperatures.

## CURING

Cure immediately after finishing with a curing compound e.g. **Guardian CURE-SW**. Large areas should be cured as work progresses. Do not use wax or P.V.A. based curing compounds if the surface is to be overcoated.

## OVERCOATING

**Guardian CRM-LHB** may be overcoated with most coating systems e.g**. Guardian ELASTOSHIELD** acrylic coatings.

## LIMITATIONS

**Guardian CRM-LHB** is not appropriate where high strengths are required or in trafficed areas (see properties). Do not mix part bags.

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## COVERAGE YIELD

| | |
|---|---|
| **Guardian CRM-LHB** | 14 - 15 litre : 18 kg bag.<br>Approx. 1.5 m2 at 10 mm thickness |
| **Guardian Zinc Primer** | 11.8 m2/litre at 50 micron d.f.t. |
| **Guardian LPA** | Approx. 5 m2/litre |

## PACKAGING

18 kg. 4 ply plastic lined bags.

## STORAGE & SHELF LIFE

**Guardian CRM-LHB** has a shelf-life of up to 12 months in unopened packs kept in a dry store. If high humidity is apparent the life may be reduced to 6-8 months.

## HEALTH & SAFETY

**Guardian CRM-LHB** is non-toxic but is alkaline in its nature. Avoid inhalation of dust and contact with skin and eyes. Wear suitable protective clothing, gloves and eye protection and dust mask. In case of contact with eyes rinse immediately with plenty of water and seek medical advice. When in contact with skin rinse with clean water and cleanse with soap and water.
**Guardian CRM-LHB** is non-flammable.

## TECHNICAL SERVICE

**Guardian Coating Service Department** is available to assist you in the correct use of our products and its resources are at your disposal entirely without obligation.

## QUALITY ASSURANCE (OEM)

ISO 9001: 2015 verified by TUV Nord