

# Fosroc® Renderoc LA60

constructive solutions

**High performance free flowing low alkali microconcrete conforming to the requirements of Highways Agency Specification for Highways Class 29F**

## Uses

For the reinstatement of reinforced concrete where low permeability characteristics are required and where high compressive strength is a consideration.

It is suitable for use where excellent chloride and carbon dioxide resistance is required or for repairs to concrete affected by alkali-silica reaction (ASR). Renderoc LA60 is alkaline in nature and will protect embedded steel reinforcement.

## Advantages

- Maximum compatibility with concrete of compressive strength 30 - 60 N/mm<sup>2</sup>
- Dual expansion system compensates for shrinkage in the plastic and hardened states
- Low alkali content minimises risk of alkali-silica reaction
- Suitable for placement by pumping or pouring techniques into restricted locations
- Self-compacting nature eliminates honeycombing and displaces air without vibration
- High strength and low permeability provide maximum protection against carbon dioxide and chlorides

## Properties

The following results were obtained at a water : powder ratio of 0.148 and a temperature of 20°C unless otherwise stated

Test method	Highways Agency Specification	Result
Cement content	> 400 Kg/m <sup>3</sup>	600 Kg/m <sup>3</sup>
Water / cement ratio @ 3.7 litres per 25Kg bag	£ 0.45	0.41
Chloride ion content	£ 0.1	0.03%
Working time	-	Typicaly 60 minutes
Set time	-	Typicaly 6 hours
Wet density	-	2.288
Air content	£ 7%	Typicaly < 3%

**Clarification of property values:** The typical properties given above are derived from laboratory testing. Results derived from field applied samples may vary.

- Suitable for use with cathodic protection systems
- Contains no chloride admixtures

## Description

Renderoc LA60 is based on selected hydraulic cements, graded aggregates and additives which impart controlled expansion in both the plastic and hardened states while minimising water demand. Requiring only the addition of clean water on site Renderoc LA60 can typically be applied in thicknesses between 50 and 150 mm. Consult the local Fosroc office for further information.

## Specification Clause

The repair mortar shall be Renderoc LA60 a one component micro-concrete conforming to the requirements of Highways Agency Specification for Highways Class 29F .

## Standards compliance

Renderoc LA60 conforms to the requirements of the UK Highways Agency Design Manual for Roads and Bridges (BD27/86, Clause 4) 'Materials for the Repair of Concrete Highway Structures' and has been formulated to comply with the requirements of the Specification for Highway Works, Clause 1704.5 Control of Alkali-Silica Reaction.

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## Application instructions

### Preparation

The unrestrained surface area of the repair must be kept to a minimum. The formwork should be rigid and tight to prevent loss of material and have properly sealed faces to ensure that no water is absorbed from the repair material.

The formwork should include drainage outlets for presoaking and, if beneath a soffit, provision for air-venting. Provision must also be made for suitable access points to pour or pump the mixed micro-concrete into place.

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 50 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 abrasive-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. Abrasive-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 abrasive-blasting to remove corrosion products from pits and imperfections within its surface.

### Reinforcing steel priming

Priming of the steel reinforcement is not normally necessary unless it is to remain exposed in an environment likely to cause corrosion after preparation. When required apply one full coat of Nitoprime Zincrich Plus 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

Several hours prior to placing, the prepared concrete substrates should be saturated by filling the prepared formwork with clean water. Immediately prior to the application of Renderoc LA60, any excess water should be removed.

In exceptional circumstances, e.g. where a substrate/repair barrier is required, Nitobond EP bonding aid should be used. Contact the local Fosroc office for further information.

### Mixing

Care should be taken to ensure that Renderoc LA60 is thoroughly mixed. A forced-action mixer is essential. Mixing in a suitably sized drum using an approved Conbextra Spiral Paddle with a slow speed (400/500 rpm) heavy-duty drill is acceptable. Free-fall mixers must not be used. Mixing of part bags should never be attempted.

It is essential that machine mixing capacity and labour availability is adequate to enable the placing operation to be carried out continuously. Measure 3.4 - 3.7 litres of drinking quality water and pour three-quarters into the mixer. With the machine in operation, add one full 25 kg bag of Renderoc LA60 and mix for 1 minute before adding the rest of the water. Mix for a further 2 to 3 minutes until a smooth even consistency is obtained. Note that powder must always be added to water. The quantities mixed may be scaled up as required.

When the drill and paddle mixing method is used, the required water content should be placed in the mixing drum. With the paddle rotating, add one full 25 kg bag of Renderoc LA60 and mix for 2 to 3 minutes until a smooth even consistency is obtained.

It is recommended that the mixed product be passed through a suitable coarse metal screen prior to placing or pumping to highlight any unmixed material.

### Mixing warning

As with other 'one pack' repair mortars, Renderoc LA60 may exhibit satisfactory handling characteristics even though inadequately mixed. This will result in a significantly lower level of performance or possible failure. It is therefore essential that mixing instructions are strictly adhered to with particular emphasis on the quantity of water used and the time of the mixing operation.

### Placing

The mixed material should be placed within 30 minutes of mixing in order to gain the full benefit of fluidity and of the expansion process. If placing by pump, standard concrete pumping practice should be followed. Consult the Fosroc Office for further details.

### 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.



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## Curing

The formwork should be left in place until the compressive strength of the Renderoc LA60 is 10 MPa or as otherwise specified by the Supervising Officer. Renderoc LA60 is a cement-based concrete reinstatement material. In common with all cementitious materials, Renderoc LA60 must be cured immediately after the formwork is stripped in accordance with good concrete practice. Immediately after striking the formwork, all exposed faces of the repair should be thoroughly soaked with clean water and then sprayed with a liquid curing membrane such as Concure WB. 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 LA60 is extremely durable and will provide long term protection to the embedded steel reinforcement within the repaired locations. The surrounding parts of the structure will generally benefit from the application of a 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 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. All traces of form-release oils and curing membranes must be removed prior to the application of Dekguard products. This is best achieved by light grit blasting.

## Cleaning

Renderoc LA60 and Concure WB 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 Plus and Nitobond EP should be cleaned with Fosroc Solvent 102.

## Limitations

Renderoc LA60 should not be used when the temperature is below 5°C and falling. Do not mix part bags. The product should not be used to reinstate horizontal areas where the surface would remain unrestrained during cure. It should not be exposed to moving water during application. If any doubts arise concerning temperature, application or substrate conditions, consult the local Fosroc office.

## Estimating

### Supply

Renderoc LA60:	25 kg bags
Nitoprime Zincrich Plus:	1.9 litre and 800 ml cans
Nitobond EP:	4.5 kg packs
Concure WB:	20 litre drums
Fosroc Solvent 102:	5 and 25 litre tins
Coverage and yield	
Renderoc LA60:	Approx. 12.5 litres / 25 kg bag
Nitoprime Zincrich Plus:	8 m <sup>2</sup> /litre
Nitobond EP:	10 m <sup>2</sup> / 4.5kg pack
Concure WB:	5 m <sup>2</sup> /litre

Notes: 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

The product has a shelf life of 12 months from the date of manufacture if kept in dry storage in the original, unopened bags. If stored at high temperatures and/or high humidity the shelf life may be reduced to less than 6 months. Concure WB should be protected from frost.

## Precautions

### Health and safety

For further information refer to the Safety Data Sheets available at [www.fosroc.com](http://www.fosroc.com).

### Fire

Renderoc LA60, Nitobond EP and Concure WB are non-flammable.

Nitoprime Zincrich Plus and Fosroc Solvent 102 are flammable. Keep away from sources of ignition. No Smoking. In the event of fire, extinguish with CO<sub>2</sub> or foam. Do not use a water jet.

### Flash points

Nitoprime Zincrich Plus:	41°C
Fosroc Solvent 102:	33°C

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#### Important note

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