

## Renderoc LA55

**Super fluid, high strength, low alkali, micro-concrete reinstatement mortar, for form and pour applications**

### USES

Renderoc LA55 is ideal for the reinstatement of large, structural sections of concrete as well as for many smaller locations where difficulties of access make hand or trowel-applied mortars impractical. The highly fluid nature of Renderoc LA55 obviates the need for compaction and vibration even where access to the repair zone is restricted or where reinforcement is congested. 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 LA55 is alkaline in nature and will protect embedded steel reinforcement. The resistivity of Renderoc LA55 make it suitable for electro-chemical repairs.

**Important note 1:** This micro-concrete is approved for use with Norcure\* re-alkalisation and Norcure\* desalination. When using it in conjunction with these methods, the concrete bonding primer should be water or an OPC:water slurry. Polymer or epoxy bonding agents should not be used. No steel primer should be applied. Refer to your local Parchem sales office for further advice.



**Important note 2:** Renderoc LA55 is suitable for use with the Fosroc Galvashield XP incipient anode protection, with a resistivity <math><15,000 \Omega \text{ cm}</math> @ 28 days.



### ADVANTAGES

- Suitable for electro-chemical repairs
- Pre-bagged to overcome site-batched variations - only the site addition of clean water is required
- Contains no chloride admixtures
- Unique system offers an extremely high level of control of plastic and long-term drying shrinkage
- Low alkali content minimises risk of alkali-silica reaction
- Excellent bond to concrete substrates without independent primer
- Very low permeability provides excellent protection against carbon dioxide and chlorides
- Exceptional flow allows pumping or pouring into restricted locations
- Self-compacting nature eliminates honeycombing and displaces air without vibration



### DESCRIPTION

Renderoc LA55 is supplied as a ready to use blend of dry powders which require only the site addition of clean water to produce a free-flowing, shrinkage compensated, micro-concrete suitable for large volume repairs at a nominal thickness in excess of 50 mm.

The material is based on Portland Cement, graded aggregates and additives, which minimises water demand, promotes high fluidity, ensures fast strength gain and long-term durability. A unique system controls plastic and long-term drying shrinkage. The aggregate grading is designed to aid uniform mixing and to eliminate segregation under pumping pressures. It's low alkali content minimises the risk of alkali-silica reaction. The hardened product exhibits excellent thermal compatibility and very low water permeability.

Maximum aggregate size is 5 mm.

an  company



<b>PARCHEM</b>	<b>CONCRETE REPAIR</b>	FLOORING	JOINTING SYSTEMS	WATERPROOFING
TECHNICAL DATA SHEET	SEPTEMBER 07			
<a href="http://www.parchem.com.au">www.parchem.com.au</a>	7 Lucca Road, Wyong NSW 2259	Sales 1800 624 322	Technical 1800 812 864	ABN 80 069 961 968

## TECHNICAL SUPPORT

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

## DESIGN CRITERIA

Renderoc LA55 is designed for large volume repairs typically in excess of 50 mm deep. The product can be applied in sections generally between 50 mm - 200 mm thick. Greater thicknesses may be achievable dependent on the configuration of the repair, location and volume of exposed reinforcing steel. Long narrow repairs should be avoided where possible and pours arranged to achieve a length:minimum thickness ratio, of not more than 20:1. Under conditions of high temperature and rapid drying or when very small sections are being constructed this ratio should be reduced. Longer lengths may be achievable, again dependent on configuration, steel position and density, ambient temperature, humidity and other environmental considerations. Consult your local Parchem sales office for further information.

## PROPERTIES

The following results were obtained at a water:powder ratio of 0.133 and temperature of 20°C.

Test method	Typical result
<b>Compressive strength (BS 1881 Pt 116:1983 - restrained):</b>	30 MPa @ 3 days 42 MPa @ 7 days 60 MPa @ 28 days
<b>Flexural strength (BS1881 Pt 118:1983):</b>	5 MPa @ 7 days 7.5 MPa @ 28 days
<b>Modulus of elasticity in compression (BS 1881 Pt 121:1983 – restrained):</b>	34 kN/mm <sup>2</sup> @ 28 days
<b>Bond strength (BS 6319 Pt 14:1984) slant/shear - substrate presoaked, no bonding aid:</b>	54 MPa @ 28 days (monolithic failure)
<b>Coefficient of thermal expansion:</b>	10 - 15 x 10 <sup>-6</sup> /°C
<b>Drying shrinkage (AS1012 Pt 13):</b>	<300 microstrain @ 7 days <550 microstrain @ 28 days

## Flow properties

### (UK Dept of Transport

**BD 27/86 Clause 4.6[b]):** >1000 mm in 4 - 10 secs (initial)  
>850 mm in 5 - 15 secs  
(after 30 minutes)

## Setting time

### (BS 5075 Pt1:1982)

**Initial set:** 6 hours, 30 minutes  
**Final set:** 9 hours

## Water absorption ISAT

### (BS 1881 Pt 5:1970)

**10 mins:** 0.019 ml/m<sup>2</sup>/sec  
**2 hours:** 0.002 ml/m<sup>2</sup>/sec

## Chloride diffusion

### (ASTM C1202-91):

<1000 coulombs  
very low category

## Carbon dioxide barrier - equivalent thickness of concrete to

### Renderoc LA55 @ 50 mm

**(Taywood method):** 2000 mm

## Freeze – thaw

### (BS 5075 Pt 2:1982):

0.0005% expansion after  
50 cycles

## Resistivity (Midland

### Links Specification

**Clause 1770AR):** 11,800 Ω cm @ 28 days

## Alkali content:

The calculated equivalent sodium oxide is approximately 2.9 kg/m<sup>3</sup>

## Fresh wet density:

Approximately 2270 kg/m<sup>3</sup>  
dependent on actual  
consistency used

## Chemical resistance:

The low permeability of Renderoc LA55 severely retards chemical attack in aggressive environments.  
The cured micro-concrete resists the ingress of acidic gases, water borne chloride and oxygen

## SPECIFICATION CLAUSES

### STEEL REINFORCEMENT PRIMER

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

### FLUID MICRO-CONCRETE REPAIR SYSTEM

The fluid repair system (micro-concrete) shall be Renderoc LA55, a single-component, low-alkali cement-based blend of powders to which only the site-addition of clean water shall be permitted. The micro-concrete shall exhibit a 3 day compressive strength of 30 MPa and a 28 day strength of 60 MPa, a 28 day modulus of elasticity in compression of 34 kN/mm<sup>2</sup> and flexural strength of 7.5 MPa. The sodium oxide equivalent should be less than 3.0 kg/m<sup>3</sup>. The chloride diffusion shall be no greater than 1000 (ASTM C1202-91 method), and a 50 mm cured section of micro-concrete shall provide a carbon dioxide barrier equivalent to not less than 2000 mm of concrete (Taywood method). The unrestrained drying shrinkage, measured using 285 mm x 75 mm x 75 mm prisms at 23°C and 50% RH shall not exceed 300 microstrain at 7 days and 550 microstrain at 28 days.

## 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 50 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 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

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 LA55, this water should be removed from the formwork.

In exceptional circumstances, e.g. where a substrate/repair barrier is required, 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 LA55 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. 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 2.4 - 2.8 litres of drinking quality water and pour three-quarters into the mixer. With the machine in operation, add one full 20 kg bag of Renderoc LA55 and mix for one minute before adding the rest of the water. Mix for a further 2 - 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 complete 2.4 - 2.8 litres of water should be placed in the mixing drum. With the paddle rotating, add one full 20 kg bag of Renderoc LA55 and mix for 2 - 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 LA55 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. The pump and pipeline must be 'grouted' with a rich cement slurry or mortar, discharging the 'grout' as waste. Pumping should be commenced immediately after 'grouting' in this way.

Renderoc LA55 when used for reinstatement of horizontal areas, must be suitably restrained by formwork.

#### **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 iced water used for mixing.

#### **CURING**

Correct curing is essential to ensure optimum performance of the product.

The formwork should be left in place until the compressive strength of the Renderoc LA55 is 10 MPa or as otherwise specified by the Supervising Officer. Renderoc LA55 is a cement-based concrete reinstatement material. In common with all cementitious materials, Renderoc LA55 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 WB30\*. Any delay in starting the curing process after the formwork is stripped will adversely affect the performance of the product. 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 LA55 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. 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 or sand-blasting.

#### **CLEANING**

Renderoc LA55 and Concure WB30 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 LA55 should not be used when the temperature is below 5°C and falling. Do not mix part bags under any circumstances. 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 your local Parchem sales office.

## ESTIMATING

### SUPPLY

<b>Renderoc LA55:</b>	20 kg bag
<b>Nitoprime Zincrich:</b>	1 litre can
<b>Nitobond EP:</b>	1.5 and 6 litre packs
<b>Concure WB30:</b>	20 and 200 litre drums
<b>Solvent 10:</b>	4 and 20 litre cans

### COVERAGE AND YIELD

<b>Renderoc LA55:</b>	Approx 10 litres / 20 kg bag
<b>Nitoprime Zincrich:</b>	7.4 m <sup>2</sup> / litre
<b>Nitobond EP:</b>	4 - 5 m <sup>2</sup> / litre
<b>Concure WB30:</b>	4 - 6 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

### SHELF LIFE

All products have a shelf life of 6 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.

## 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.

\*Manufactured and sold under license from Fosroc International Limited. Fosroc and the Fosroc logo are trade marks of Fosroc International Limited, used under license. \*Denotes a trade mark of Fosroc International Limited.

<b>PARCHEM</b>	<b>CONCRETE REPAIR</b>	FLOORING	JOINTING SYSTEMS	WATERPROOFING
<b>TECHNICAL DATA SHEET</b>	<b>SEPTEMBER 07</b>			
<a href="http://www.parchem.com.au">www.parchem.com.au</a>	<b>7 Lucca Road, Wyong NSW 2259</b>	<b>Sales 1800 624 322</b>	<b>Technical 1800 812 864</b>	ABN 80 069 961 968 <b>6</b>