Renderoc® LAXtra

FOSROC constructive solutions

Shrinkage controlled, polymer modified, fluid micro concrete for structural repairs of all types

Uses

Renderoc LAXtra is suitable for mass infill to structural repairs in all types of load bearing situation. Typical applications would include, but not be limited to, the following :

- Repairs to columns suffering from major loss of section
- Soffit repairs where heavy load bearing is required
- Repairs to restricted access areas, where use of hand applied mortars would prove impractical
- Repairs requiring high fluidity e.g. heavily congested steel or repairs into re-entrant angles/concealed voids
- Any repairs requiring signifi cant levels of loadbearing

Advantages

Renderoc LAXtra features Dimensional Stability Technology a new material technology which controls the rate of drying shrinkage such that, when used correctly :

i. the dimensions of the repair remain stable; and thus

ii. eliminating failure, due to shrinkage cracking.

This in turn leads to a series of associated benefits :

- Cost effective - shrinkage control enables repairs to be completed 'right first time'
- Enhanced durability - works in tandem with extremely low permeability to prolong effective working life
- Compatibility - aligns performance closer than ever before, to that of host concrete
- User friendly - specifically developed to provide an easy to apply product, suitable for local conditions
- Definable performance - positive benefits are easily demonstrated via a single, simple measurement

Description

Renderoc LAXtra is supplied as a ready to use blend of dry powders and selected aggregates, which requires only the addition of clean water to produce a highly consistent, fluid microconcrete suitable for all load-bearing situations.

Technical support

Fosroc offers a technical support package to specifiers, end users and contractors as well as technical on-site assistance in locations all over the country

Design Criteria

Dimensional Stability Technology is a major step forward in the general compatibility of repair mortar systems with the host concrete, and the control of shrinkage in particular.

Attention to the basic design criteria given below should ensure that the full benefits of this technology are gained in use :

(i) Renderoc LAXTRA is designed for large volume repairs, typically in excess of 50 mm deep. The product can be applied in sections generally between 50 and 200 mm thick, greater thicknesses may be achievable, depending upon repair configuration and location together with the volume of reinforcing steel. Consult the local Fosroc office for more information.

(ii) In situations where a substrate/repair barrier is required, or enhanced bond strength/working time is required, or where the substrate is likely to be damp (e.g. seawalls, quays etc.), Nitobond EP epoxy bonding agent should be used.

(iii) Water addition = 3.5ltrs / 25kg bag Under no circumstances should part bags be used or additional water be employed. Either of these two actions will adversely affect material performance, automatically invalidating Fosroc's standard product guarantee.

Properties

The following results were obtained at a Water : Powder ratio of 0.14.

Test parameters	Typical test results at 20^0C
Compressive strength (Nmm^2) (BS 1881 Pt.1161)	100 mm cubes , air cured at 20^0C
Age (Days)	Results
3 Days	> 35.0 N/mm^2
7 Day	> 45.0 N/mm^2
28 Day	> 55.0 N/mm^2

Test parameters	Typical test results at 30°C
Flexural strength (BS 6319 pt.3)	> 9 N/mm² @ 28 days
Tensile strength (BS 6319 Pt.7)	> 3.5 N/mm²
Drying shrinkage ASTM C157-93	
7 days 28 days	< 300 micro strain < 500 micro strain
Permeability (DIN 1048 Part 5)	< 10mm
Water absorption (BS 1881 Pt. 122)	< 2%

Note: The typical physical properties given above are derived from testing in a controlled laboratory environment. Results derived from testing field-applied samples may vary, dependent on actual site conditions.

Specification Clause

Performance specification

The fluid micro-concrete repair material shall be a Renderoc LAXtra a single component, cement based material to which only the site addition of clean water (and approved graded coarse aggregates where specified) shall be permitted. The repair grout in the flowable consistency should be permitted. The repair grout in the flowable consistency should achieve a compressive strength of not less than 35 N/mm² after 3 days at 20°C, 45 N/mm² after 7 days and 55 N/mm² after 28 days. The micro concrete shall have a flexural strength of not less than 9 N/mm² and a tensile strength of greater than 3.5 N/mm² after 28 days. The drying shrinkage shall be less than 300 micro strain after 7 days and less than 500 microstrain after 28 days. The micro concrete shall have a coefficient of thermal expansion similar to that of the host concrete.

Application instructions

Preparation

The unrestrained surface area of the repair must be kept to a minimum. The formwork should include drainage outlets for pre-soaking and, if beneath a soffit, provision for air venting. Provision must also be made for suitable access points to pour pump the mixed micro-concrete in place.

Defective concrete surfaces must be cut back to a sound base. Smooth surfaces should be mechanically roughened. Corroded reinforcing steel should be exposed around its full circumference and cleaned to remove all loose scale and corrosion deposits. It is important to clean the steel to a bright condition. Grit-blasting is recommended.

One coat of Nitozinc Primer should be applied on the reinforcing steel. If any discontinuity in the applied film is noticed, one more coat has to be applied.

In case the reinforcement needs to be protected from corrosion, it is advisable to install Fosroc Galvashield range of anodes as per the design and durability considerations.

Several hours prior to placing, the concrete substrates should be saturated with clean water. Immediately prior to placing, any free water should be removed. Alternatively, all prepared concrete substrates should be primed using Nitobond EP, a slow - setting epoxy bond aid. Nitobond EP shall be applied only on dry substrate. In places where Fosroc Galvashield anodes are used contact Fosroc for the use of bonding agents.

Note : For concrete jacketing projects its difficult to maintain the open life of the bonding agent, for such cases please contact Fosroc. For repair sections generally deeper than 100mm it may be necessary to mix the Renderoc LAXtra with properly graded 5mm to 12mm silt -free aggregate to minimise temperature rise. The quantity of aggregate required may vary depending on the nature and configuration of the repair location. In case of addition of aggregates at site, please contact Fosroc.

Mixing

Care should be taken to ensure that Renderoc LAXtra is thoroughly mixed in a forced-action mixer of adequate capacity. Alternatively, mix in a suitably sized drum with a high torque (400/500 rpm) rotary drill fitted with a mixing paddle.

It is essential that machine mixing capacity and labour availability is adequate to enable the placing / pumping operation to be carried out continuously. The quantity of water required will generally be 3.5 litres per 25 kg bag of Renderoc LAXtra. The optimum water content should be determined and accurately measured into the mixer.
However it should not exceed 3.5 litres / 25 kg in any case. With the mixer running, slowly empty Renderoc LAXtra bag into the mixer. Mix continuously for 5 minutes, ensuring a smooth even consistency of the mix.

Where the addition of graded coarse aggregate has been specified it should be added after the water and should be mixed with Renderoc LAXtra properly. Mixing should then continue for a further 1 minute to ensure proper dispersion.

Form Work

Slurry tight form work that will not deform or leak when subjected to hydraulic pressure imposed by the micro concrete will be fabricated and erected where the material is gravity fed. Provision in the formwork will be made for a suitable feed hopper at the highest point. Where necessary, provision will be made for air vents to prevent air entrapment. Form work will be coated with Reebol mould releasing agent prior to fixing.

Placing

The mixed material should be placed immediately. If placed by pump, standard concrete pumping practice should be followed. The pump and pipeline must be primed with cement slurry. Pumping should be commenced immediately after priming. If poured in the form work, avoid air entrapment by pouring from one side only.

Low temperature working

In cold conditions down to 15^{0}C, the use of warm water (up to 30^{0}C) is advisable to accelerate strength development. Normal precautions for working with cementitious materials in winter should be adopted.

High temperature working

At ambient temperature above 35^{0}C the material should be stored in the shade and cold water used for mixing.

Curing

As Renderoc LAXtra is a cement-based repair material, it must be cured immediately after stripping the formwork in accordance with good curing practice. Fosroc's Concure range of curing compounds can be used on the surface of the Renderoc LAXtra as a continuous film soon after stripping the form work. In harsh drying conditions, supplementary curing such as wet hessian and/or polythene sheeting must be used.

Estimating

Packaging

Renderoc LAXtra is available in 25 kg bags.

Yield

Approximately 12.25 litres per 25 kg bag.

Actual yield per bag will depend on the consistency of Renderoc LAXtra and quantity of coarse aggregate added if any.

Storage

Shelf life

Renderoc LAXtra has a shelf life of 6 months if kept in a dry store in the original, unopened bags. If stored at high temperatures and/or high humidity conditions the shelf life may be reduced.

Standard Compliance

Renderoc LAXtra repair microconcrete complies with the following international standards :

ASTM C157-93 : Test for drying shrinkage

BS 1881 Pt.122 : Water absorption

Precautions

Health and safety

Renderoc LAXtra contains cement powders which, during normal use, have no harmful effect on dry skin. However, when Renderoc LAXtra is mixed, or becomes damp, alkali is released which can be harmful to the skin. During use, avoid inhalation of dust and contact with skin and eyes. Wear suitable gloves, eye protection and dust masks. The use of barrier creams is recommended. In case of contact with skin, wash with clean water. In case of contact with eyes, rinse immediately with plenty of clean water and seek medical advice. If swallowed, seek medical attention immediately - do not induce vomiting. Renderoc LAXtra non-flammable. For further information, please refer to the Product Material Safety Data Sheet for Renderoc LAXtra.

Additional Information

Fosroc manufactures a wide range of products specifically designed for the repair and refurbishment of damaged reinforced concrete. These include hand placed and trowellable repair mortars, fluid micro concretes, chemical resistant epoxy mortars, Fosroc Galvashield anodes and a comprehensive package of protective coatings.

In addition, a wide range of complimentary products are available These include admixtures, joint sealants, waterproofing membranes, grouting, anchoring, and specialised flooring materials.

Separate datasheets are available for each product.

Fosroc Chemicals (India) Pvt. Ltd.
Head Office
Embassy Point
No:150, 2nd Floor,
Infantry Road,
Bangalore — 560001.

Telephone:
+91 80 42521900

Fax:
+91 22281510

email:
enquiry.india@fosroc.com

Regional Offices

Chennai
Hills Centre,Old No 5,
New No 9, 3rd Cross Street,
Jeth Nagar, Raja Annamalaipuram,
Chennai 600 028.
Ph: 9500064795

Mumbai
MBC Park, 12th floor, Office No.12B,
'D' Block, Near G Corp/Hyper City
Kasarwadawali, Ghodbunder Road,
Thane (West) 400 615
Ph: +91 22 6229 6800

Noida
Unit No. 601, Highway Tower-II
A-13/2, 6th Floor, Sector– 62
Gautam Buddha Nagar,
Noida 201 309, Uttar Pradesh
Ph: +91 120 6121900
Fax: 0120-4270622

Kolkata
304, Jodhpur Park
Kolkata 700 068
Ph:+91 33-65343188
Fax: 033-2499-0278

www.fosroc.com