

FOSROC



constructive solutions

Fosroc Repair & Refurbishment Solutions

High performance repair systems



Renderoc
Nitomortar
Nitofill
Nitobond



constructive solutions

Company Profile

Fosroc is a world leader in the delivery of tailored Constructive Solutions for virtually any type of construction project, combining high quality products, expert technical support, customer service and innovation.

Fosroc's worldwide presence includes group companies in 15 countries with exports to over 70 countries.

Fosroc has over 76 years experience in supply of speciality chemicals and have gained the acknowledgement as "market leaders" in quality production and supply of the most comprehensive range of high performance construction chemicals serving the construction industries in building and civil structures above and below ground.

Fosroc's product range is as follows:-

- | | |
|-----------------------|----------------------|
| ■ Admixtures | ■ Grouts & Anchors |
| ■ Adhesives | ■ Joint Sealants |
| ■ Protective Coatings | ■ Surface Treatments |
| ■ Concrete Repairs | ■ Grinding Aids |
| ■ Industrial Flooring | ■ Waterproofing |

Fosroc Support

Our experienced staff will assist you with high level support in:

**CAD Details
Project Specifications
Site Support
Seminars & Training**

Global leaders in delivering Constructive Solutions



www.fosroc.com



Fosroc offers a comprehensive range of concrete repairs and refurbishment products tested to Gulf conditions. Our Renderoc repair mortars have internationally proven track record.

Whatever the structure- from commercial buildings, car parks, jetties to bridges, Fosroc's technical expertise in concrete repair technology can help guide you through the application, enabling you to develop a cost effective and highly beneficial solution for your concrete repair project.



Factors causing deterioration in concrete

- **Corrosion damage due to attack from:**
 - Carbonation
 - Chlorides
- **Corrosion due to moisture**
 - Leaks
 - Failed waterproofing
- **Fire damage**
- **Honey Combing**
- **Surface imperfection/Cracks**
- **Physical damage**
 - Impact
 - Erosion
 - Earthquake
- **Chemical attack**
 - Chemical factories
 - Factory process
 - Sewage
- **Pin holes/blow holes**



Why cracks need to be filled

- Cracks may provide a path for ingress of CO₂ or/and water containing dissolved salts (chlorides)
- To stop water leakage, to enhance aesthetic purposes & to improve structural concerns
- Cracks are classified as either "live" or "dead" and the most suitable repair method depends on this classification



Fosroc Philosophy for Refurbishment Projects

1 Structural Assessment

Present condition of structure
History of structure
Environment
Contamination

2 Diagnostic Techniques

Visual inspection
Chloride test
Carbon dioxide test
Core test
Hammer test

Fosroc recommends necessary tests to be carried out to reach the root cause of the problem.

3 Root Cause Analysis(RCA)

Deterioration of concrete could be due to corrosive agents – chlorides, carbon dioxide, sulphates. Other factors such as shrinkage, cracking, abrasion, impact, erosion, cavitation also deteriorate and damage the concrete

Understanding and addressing the root cause of concrete deterioration is the key to success in refurbishment jobs.

Fosroc experts identify hidden causes for the deterioration of reinforced concrete.

4 Selection of Repair Products

Cementitious repair mortars
Epoxy repair mortars
Polyester repair mortars

Fosroc experts select the right product according to the structure and problem identified.

5 Application of Repair Products

Specialized applicators

Fosroc also offers training and on-site technical support to contractors.

What is Corrosion

A number of everyday contaminants are able to break down the protective layer on steel in concrete and cause corrosion. Corrosion like many other diseases is progressive in nature, with its effects increasing over time.

Understanding the problem of corrosion, along with the associated signs is the first step towards a sustainable future. If left untreated deterioration will accelerate, seriously compromising structural integrity and resulting in failure.

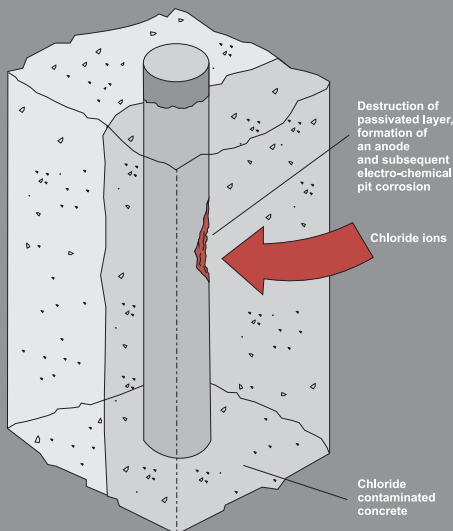
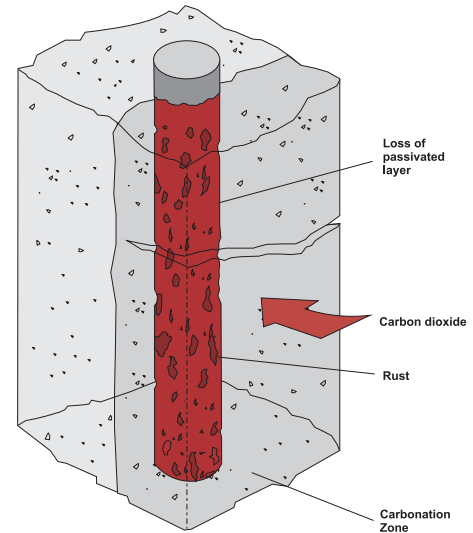


Causes of Corrosion



■ Carbonation

- CO₂ attack of the concrete surface leads to a 'carbonation' front gradually penetrating into the concrete.
- The carbonation front follows cracks into the concrete.
- All concretes have a surface carbonated zone.
- Steel reinforcement will have a concrete cover i.e. the distance from the steel to the concrete surface. Highest rate of carbonation occurs in relative humidity between 50 and 75 percent
- Once the carbonation front has reached the passive layer, the pH of the concrete will be reduced and the passive layer destroyed.
- With the presence of moisture the steel rusts.

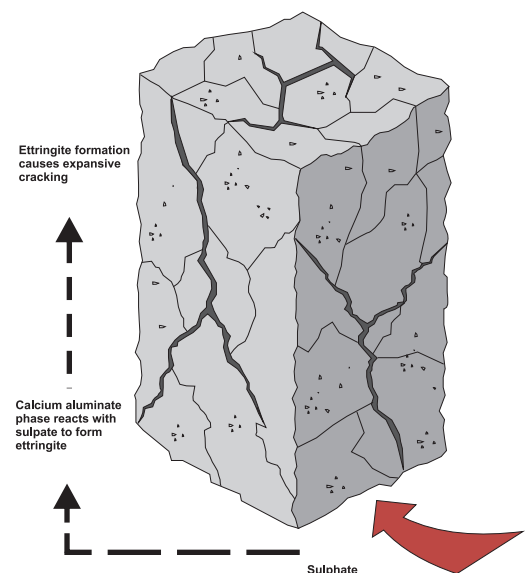


■ Chloride attack

- Chlorides enter concrete either from chloride based admixtures or in water (e.g. from deicing salts, seawater) saturating the concrete.
- Once the chlorides reach the steel, the passive layer will be destroyed and corrosion starts.
- Note that corrosion is localized at a specific area, forming a 'corrosion pit' which may eventually 'eat' through the whole bar leading to loss of structural integrity.

■ Sulphate attack

- Ground water sulphate reacts with calcium aluminates phase – expansion and cracking.
- Sulphate combines with Calcium ions from the hydration to form gypsum.
- SRPC reduces level of calcium aluminates phase Blended cements can also increase resistance due to binding to Calcium hydroxide.



Fosroc options for repair

- Cement based mortars
- Epoxy based mortars
- Polyester based mortars



■ ***Cement Based Repair Material***

Cement based mortars are most commonly used for concrete repairs as:

- They are physically compatible with the concrete in terms of Strength
- Thermal expansion
- UV resistance
- Generally, easier to work with than epoxy products
- Single component
- Economical than epoxy products

■ ***Epoxy Mortars***

Epoxy mortars would generally be used in areas where the following properties are required

- High chemical resistance
- High abrasion resistance
- Rapid curing

■ ***Polyester Mortars***

2 grades available – standard and tropical

- Can be mixed in different ratios on site to give varying consistency for required use
- Fast setting
- High Strength
- Can be applied on damp surfaces

Product selector

Water stopping mortar	Hand or trowel applied	Concrete/masonry	Horizontal, vertical or overhead	Renderoc Plug
Leaking cracks	Injection	Concrete	Horizontal, vertical or overhead	Nitofill WS60 + Nitofill UR63
Filling blow holes (Surface imperfections)	Trowel applied	Concrete/masonry	Vertical or overhead	Renderoc FC/BF2 Nitomortar FC/FCB
Reinstatement/Rebuilding (Honeycombing/Corrosion)	Hand or Trowel applied	Concrete	Vertical or overhead	Renderoc TG/TGXtra
Reinstatement/Rebuilding	Hand or Trowel applied	High build Concrete repairs	Vertical or overhead	Renderoc HSXtra
Reinstatement/Rebuilding	Spray applied	Large area Concrete repairs	Vertical or overhead	Renderoc SPXtra
Large volume congested reinforcement	Fluid applied Pourable/Pumpable	Concrete	Vertical, horizontal or overhead with formwork	Renderoc LA/LAXtra
Skim coat	Scraper or Trowel applied	Concrete/masonry	Vertical, horizontal or overhead	Renderoc Putty
Pavement	Hand or Trowel applied	Concrete Slabs/steps	Rapid Set	Renderoc RSXtra
Reinstatement	Trowel applied	Joint arrises Concrete repairs	Vertical or horizontal	Nitomortar S
Structural crack repair	Injection/Pourable	Concrete	Vertical or horizontal	Nitofill EPLV
Hairline crack repair	Trowel applied	Concrete	Vertical or horizontal	Nitomortar FC
Wide crack repair	Trowel applied	Concrete	Vertical or horizontal	Nitomortar FCB Renderoc TGXtra

Note: The above product list is not comprehensive. If the product you require is not in this brochure please contact your local Fosroc representative.

Non - structural repair products

Renderoc Plug

Rapid setting cement based, waterstopping mortars

Emergency waterstopping capability.

Single component - pre-bagged to overcome variations in site batching.

Excellent bond to substrate.

Renderoc FC/BF/BF2

Polymer modified fairing coat

Designed for application in thin layers to produce a fair-faced appearance to concrete or masonry surfaces in readiness to receive a protective coating.



Structural repair products

Renderoc SXtra/ Renderoc HSXtra

Polymer modified, cementitious, trowellable repair mortars for reinstatement of large areas of concrete.

Nitomortar S/Nitomortar PE

Structural grade epoxy resin/polyester resin based, thixotropic & trowel applied reinstatement mortars for reinstatement of damaged/ distressed concrete cover.

Renderoc RSXtra

Fast setting, high strength, structural grade, cementitious based patch repair mortars used for emergency reinstatement of concrete pavements, airport aprons, access ramps, roadways and warehouse floors.

Rapid strength gain. Will accept traffic in just 2 hours.

High strength, abrasion and weather resistance.

Renderoc LA/LAXtra

Free-flowing, nonshrink, high strength, structural grade, low alkali micro-concretes.

Ideal for the reinstatement of large structural sections of concrete

Excellent resistance to chloride ion and carbon dioxide diffusion.

Can be used for repairs to reinforced concrete structures affected by chloride and carbonation corrosion, alkali silica reaction & sulphate attack.

Can be pumped or poured

Self compacting - expels air without vibration.



Nitofill EPLV

Two component low viscosity epoxy injection resin system for structural repairs

Additional concrete repair products

Resin based

Nitomortar Range of epoxy reinstatement mortars, with high resistance to a wide range of chemicals, suitable for emergency repairs where fast strength gain is important.

Nitomortar S

Three component ideally suited for acid tanks, sea walls, industrial floors and as a bedding mortar.

Nitomortar FC

Two component high strength trowel grade, epoxy resin fairing coat, repair mortar, bedding and adhesive

Nitomortar FCB

Two component high strength trowel grade, epoxy resin for filling blow holes and irregularities prior to the application of subsequent coatings. It can be applied in thicknesses upto 5 mm.

Nitomortar PE

Used for repairing and re-profiling of precast concrete units, damaged arrises and treads.

Nitomortar TS

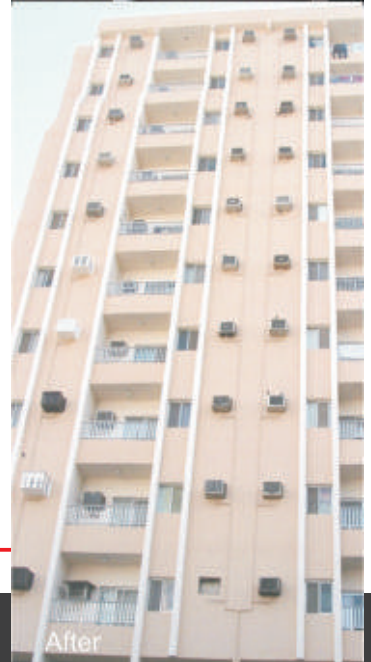
Three component epoxy-tar based engineering mortar for transition strip on bridge deck joint.

Nitomortar HB

High build epoxy reinstatement mortar, used for the fast and permanent reinstatement of concrete, particularly for emergency repairs in vertical and overhead situations.

Nitomortar MH

Three component solvent free epoxy lining and benching mortar, cost effective for vertical and horizontal patching and for resurfacing to both dry and damp surfaces. Ideal material for long lasting manhole rehabilitation.



Fosroc's technical experts can help guide you through to find the most appropriate concrete repair method.

We can also identify the products and systems that will give you the best, cost-effective solution with real long-term improvements in the quality of the structure.

Fosroc also provide CPD seminars on concrete repair.

Surface protection systems

Once damaged concrete has been repaired, consideration should be given to the protection of the structure against future attack from the surrounding environment.

Fosroc's range of protective and decorative Dekguard anti-carbonation, anti-chloride high performance coatings offer full protection and are compatible with Fosroc's range of Renderoc mortars, providing an effective and attractive repair and protection system.

Dekguard Range

Dekguard E2000/ Dekguard S / Dekguard AC / Dekguard PU

- Anti-carbonation, anti-chloride higher performance coatings
- For use on atmospherically exposed concrete
- Highly UV resistant
- Flexible, crack bridging systems

Nitocote Range

Chemical resistant cementitious and resin based coatings for use in aggressive environments or below ground

Nitocote EP405

Solvent-free epoxy resin coating for water retaining structures. WRAS approved

Nitocote EP410

Highly chemical resistant two pack epoxy system

Nitocote EPS/Nitocote EPU

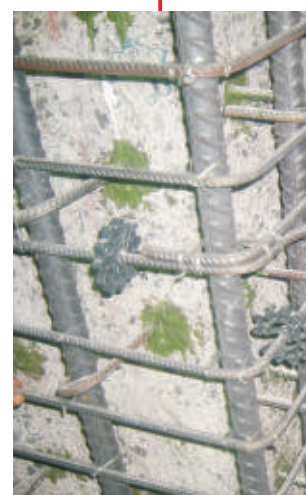
Epoxy Polysulphide/Polyurethane elastomeric protective coating against a wide range of aggressive chemicals, oils, fuels, seawater and sewage



Anchoring grout

Lokfix S80 and Lokfix P80

Rapid curing polyester resin anchoring grouts with a compressive strength of 100 MPa. Suitable for anchoring steel bars into concrete, as well as brickwork, masonry and rock.



Al Gurg Fosroc's Repairs Range

Cement based repair mortars and concretes

- Renderoc TGXtra - Shrinkage controlled, Cementitious vertical and overhead repair mortar system
- Renderoc SPXtra - Shrinkage controlled, repair mortar system designed for wet or dry spray application
- Renderoc SXtra - Shrinkage controlled structural grade repair mortar system
- Renderoc LAXtra - Shrinkage controlled fluid micro concrete for structural repairs
- Renderoc LAXtra Plus - High Strength, shrinkage controlled, polymer modified, fluid micro concrete for structural repairs of all types
- Renderoc HSXtra - Shrinkage controlled high specification repair mortar system
- Renderoc RSXtra - Shrinkage controlled rapid setting fluid repair concrete
- Renderoc FC - Single component polymer modified Cementitious fairing coat
- Renderoc FCXtra - Single component polymer modified Cementitious pinhole filler fairing coat and cosmetic mortar
- Renderoc BF - One component polymer modified Cementitious filler and reprofiling mortar
- Renderoc Plug - Rapid setting mortar for leak plugging in running water
- Renderoc BF2 - Polymer modified Cementitious blow hole filler
- Renderoc HS - Shrinkage compensated, polymer fibre reinforced, thixotropic repair mortar system
- Renderoc LA - Single component free flowing low alkali micro concrete
- Renderoc TG - Single component medium-weight concrete and masonry reinstatement mortar for use in hot climates
- Renderoc Putty - Cement based polymer rich putty for wall and ceiling

Resin based repair mortars and concretes

- Nitomortar HB - High build epoxy mortar
- Nitomortar S - High strength abrasion-resistant epoxy reinstatement mortar
- Nitomortar FC - Epoxy resin fairing coat and filler
- Nitomortar FC(B) - Epoxy resin fairing coat and blow hole filler
- Nitomortar MH - Solvent free epoxy resin lining and benching mortar
- Nitomortar EL - Abrasion resistant epoxy resin lining mortar
- Nitomortar PE - Polyester resin jointing and repair compounds
- Nitomortar FCFS - Epoxy resin fairing coat and filler (fast set version)



Galvanic protection for concrete

- Fosroc Life Jacket - Galvanic corrosion protection system for severe exposure concrete elements

Resin based crack injection grouts

- Nitofill WS60 - Crack injection resin for stopping water flow
- Nitofill UR63 - Flexible polyurethane injection resin system
- Nitofill EPLV - Low viscosity epoxy injection resin system

Reinforcement protection primer

- Nitoprime Zincrich - Active single component epoxy zinc primer

Anchoring material

- Lokfix - Polyester resin based anchoring grout

Concrete bonding agents

- Nitobond AR - Acrylic emulsion bonding agent
- Nitobond SBR - Polymer bonding aid and mortar additive
- Nitobond EP - Epoxy concrete bonding agent

Protective coating

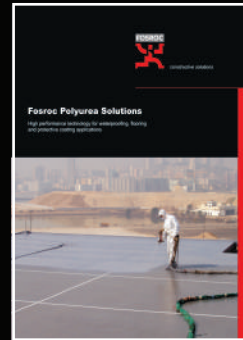
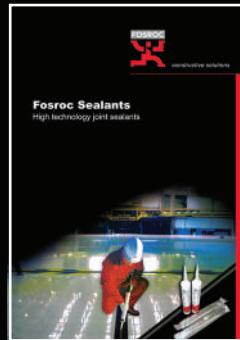
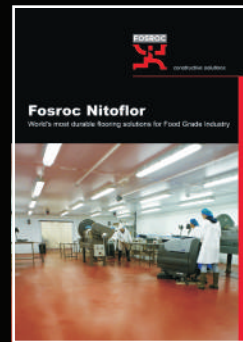
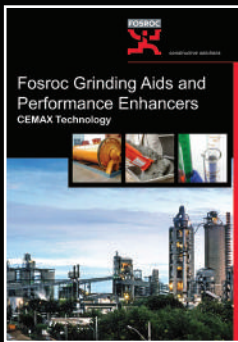
- Dekguard E2000 - Elastomeric, protective coating for concrete and masonry
- Brushbond - Acrylic polymer modified protective and decorative coating for concrete and masonry
- Dekguard S - High performance coating for concrete and masonry



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www.fosroc.com

Fosroc offers a full range of construction solutions, helping to protect structures throughout the world. Please refer to our other brochures, which include:



Details of your local Fosroc office can be found at
www.fosroc.com

Important Note

Fosroc products are guaranteed against defective materials and manufacture and are sold subject to its standard terms and conditions of sale, copies of which may be obtained on request. Whilst Fosroc endeavours to ensure that any advice, recommendation, specification or information it may give is accurate and correct, it cannot, because it has no direct or continuous control over where or how its products are applied, accept any liability either directly or indirectly arising from the use of its products, whether or not in accordance with any advice, specification, recommendation or information given by it.