



PAREX

**OUR COMPLETE RANGE OF ADVANCED
SOLUTIONS FOR CONCRETE REPAIR**

WHY IT IS IMPORTANT TO CONSOLIDATE

REINFORCED CONCRETE STRUCTURES

FIVE KEY REASONS



To restore load-bearing capacity.
In the event of accidental impacts, reinforcement, corrosion or after a fire.



To locally reinforce construction elements.
e.g. drilling of concrete slabs or walls etc.



To increase the load bearing capacity of construction elements whose initial purpose may have been modified.



To repair construction errors.



To provide added protection in aggressive environments not foreseen at the design stage.

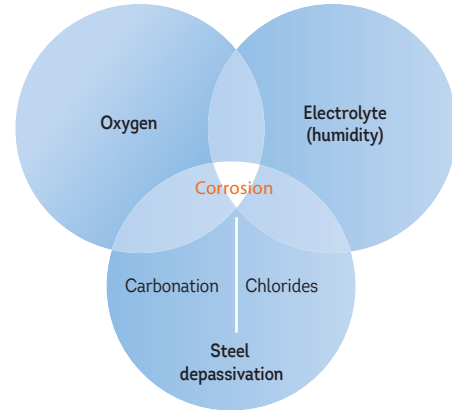
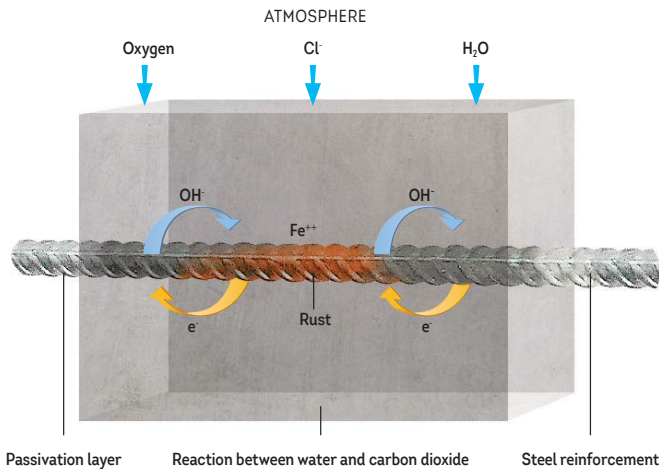
The proportioning of reinforcement elements and in particular the cross-section, the length and the position of reinforcement, must be performed by a Design & Engineering specialist with experience of performing structural reinforcement calculations. Application must solely be performed by specialist, qualified firms whose employees have received training in the appropriate application techniques and who are backed up by technical assistance from the manufacturer. Such firms must be able to provide a list of previous references for the relevant procedures. For positioning and control purposes, the specialist firm must refer to information provided in BS EN 13670:2009.



WHY STEEL REBARS BECOME CORRODED

Concrete is a **non-homogenous** material, a subtle blend of cement, aggregates, water and admixtures. It is a **living material**, subject to attack from severe weather and the environmental factors. Damage caused by rebar corrosion accounts for **80% of all concrete problems** encountered.

Steel rebar corrosion is the result of a **combination of three factors** (see diagram below). To slow down or to stop corrosion, one of these factors must be eliminated.

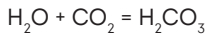


STEEL DEPASSIVATION

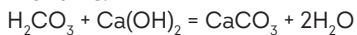
Corrosion of steel reinforcement occurs when concrete pH falls below 9. Two specific phenomena are the cause of this pH reduction:

Carbonation, in the presence of water.

Reaction between water and carbon dioxide:



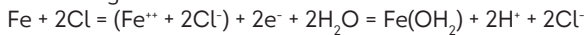
Formation of carbonic acid, which lowers pH. Then reaction with lime:



Once the carbonation reaches the reinforcement, the corrosion of the steel begins.

CHLORIDES

Chlorides from de-icing salts, sea water, or chloride-based accelerators containing calcium chloride react with the iron:



The reinforcement starts to corrode when the Cl⁻/OH⁻ ratio is greater than 1. Once this ratio has been achieved, acids form, which then triggers the corrosion process. The OH⁻ ions come primarily from the concrete. A Cl⁻/OH⁻ ratio of 1 is equal to a chloride content of 0.4% in relation to the cement weight.

In summary, exposure of reinforced concrete to chloride ions is the primary cause of premature corrosion of steel reinforcement. The intrusion of chloride ions, present in de-icing salts and seawater, into reinforced concrete can cause steel corrosion if oxygen and moisture are also available to sustain the reaction. Chlorides dissolved in water can permeate through sound concrete or reach the steel through cracks. Chloride-containing admixtures can also cause corrosion which may also be found within the concrete structure.

THE RING ANODE EFFECT

During repairs to a reinforced concrete structure showing the first signs of corrosion, the spalling /delaminating concrete is removed from around the reinforcement. The layer of rust covering the reinforcement is removed and then repairs are completed using a new mortar to re-create the profile. This naturally alkaline mortar restores the original level of protection to the reinforcement. Since the concrete adjacent to the repair zone remains contaminated by the corrosion agents (carbonates, chlorides etc), new anodic zones form in the immediate vicinity of the repaired areas, which have now become cathodic zones.

In the medium-term, the consequence of this polarity change is an acceleration of corrosion in the areas adjacent to where the repairs were carried out.

To prevent this problem, it is necessary to treat the entire structure.



PROTECTING & REPAIRING CONCRETE



REPAIRS TO CONCRETE STRUCTURES AND BUILDINGS

STRUCTURAL REPAIRS



731 LANKOREP STRUCTURE

- ▶ Thickness: 5 to 70 mm per layer
- ▶ Compliant with EN 1504-3 class R4



735 LANKOREP RAPIDE

- ▶ Thickness: 5 to 70 mm per layer
- ▶ Compliant with EN 1504-3 class R4
- ▶ Can be painted over after 24 hours



770 LANKOREP FIN RAPIDE

- ▶ Thickness: 2 to 70 mm per layer
- ▶ Compliant with EN 1504-3 class R3
- ▶ Can be painted over after 24 hours



777 LANKOIMPER SURFAÇAGE

- ▶ Thickness: < 3 mm
- ▶ Compliant with EN 1504-3 class R4
- ▶ Surfacing/waterproofing/bonding



733 LANKOREP BLANC

- ▶ Thickness: 5 to 70 mm per layer
- ▶ Compliant with EN 1504-3 class R4
- ▶ Can be painted over after 24 hours

RAPID REPAIRS



735 LANKOREP RAPIDE

- ▶ Thickness: 5 to 70 mm per layer
- ▶ Compliant with EN 1504-3 class R4
- ▶ Can be painted over after 24 hours



770 LANKOREP FIN RAPIDE

- ▶ Thickness: 2 to 70 mm per layer
- ▶ Compliant with EN 1504-3 class R3
- ▶ Can be painted over after 24 hours

NON-STRUCTURAL REPAIRS



730 LANKOREP FIN

- ▶ Thickness: 2 to 70 mm per layer
- ▶ Compliant with EN 1504-3 class R2



732 LANKOREP FAÇADE

- ▶ Thickness: 1 to 40 mm per layer
- ▶ Compliant with EN 1504-3 class R2
- ▶ Can be painted over after 24 hours

HERITAGE REPAIRS



734 LANKOREP PATRIMOINE

- ▶ Thickness: 3 to 50 mm per layer
- ▶ Base = CL90 hydrated lime

CASTABLE REPAIRS



780 LANKOREP FLUIDE

- ▶ Thickness: 15 to 250 mm per layer
- ▶ Compliant with EN 1504-3 class R3
- ▶ Formwork removal may be achieved after 4 hours

ANTI-ABRASION & ANTI-CORROSION REPAIRS



720 LANKOREP EPOXY

- ▶ Anti-abrasion and anti-corrosion mortar
- ▶ Anti-abrasion and anti-corrosion Thickness: 2 to 50 mm
- ▶ Anti-abrasion and anti-corrosion Solvent-free
- ▶ Anti-abrasion and anti-corrosion Non-shrinking

FLUID STRUCTURAL REPAIRS



TECFAST CONCRETE

- ▶ Thickness 20 to 650mm
- ▶ Compliant with EN 1504-3 class R4
- ▶ Rapid set, high early strength gain
- ▶ Transport for London LUL and Link-Up Rail approved



LA REPAIR CONCRETE

- ▶ Thickness 20 to 650mm
- ▶ Compliant with EN 1504-3 class R4
- ▶ Self-compacting, non-shrinking micro concrete
- ▶ Suitable for pumping or pouring



SEWAGE & WATER NETWORKS, TUNNELS (WATER SUPPLY, SEWAGE SYSTEMS)

REPAIRS TO VAULTS & ARCHES IN SEWAGE & WATER NETWORK SYSTEMS



736 LANKCRETE RESEAUX

- ▶ Compliant with EN 1504-3 class R2
- ▶ Can be pumped over large distances
- ▶ Application up to 80 mm
- ▶ Safety compliance certificate (CLP) granted by French health & safety committee
- ▶ Abrasion resistance index (after 28 days): < 3

REPAIRS TO THE VENT CAPPINGS OF VENTILATION SHAFTS IN SEWAGE & WATER NETWORK SYSTEMS



531 BREPOXY

- ▶ Resistant to acids, dilute acids and alkaline based components
- ▶ Water tight/impervious
- ▶ Application to dry or slightly damp substrates

REPAIRS TO APRONS AND ABUTMENTS IN SEWAGE & WATER NETWORK SYSTEM



738 LANKCRETE ABRASION

- ▶ High abrasion resistance
- ▶ Large thicknesses up to 80 mm
- ▶ Compliant with EN 1504-3 class R3
- ▶ CNR abrasion index (after 28 days): < 1



739 LANKCRETE SPECIAL

- ▶ High abrasion resistance
- ▶ Large thicknesses up to 80 mm
- ▶ Compliant with EN 1504-3 class R3
- ▶ CNR abrasion index (after 28 days): < 1

INJECTION

INJECTION GROUT



737 LANKREP FISSURE

- ▶ Very fluid grout
- ▶ Very high mechanical strength



CORROSION TREATMENT

TREATMENT OF CARBONATED CONCRETE:

761 LANKOSTEEL, AN IMPREGNATING CORROSION INHIBITOR

Impregnating corrosion inhibitors can be classified into three groups:

Group 1

Absorption inhibitors: the product adheres to the surface of steel and forms a protective layer that acts as a barrier against polluting agents.

Group 2

Oxidizing inhibitors: the product protects steel by forming a compact layer of iron oxide. These products require oxygen in order to be effective and also must be precisely measured.

Group 3

Non-oxidizing inhibitors: the product forms an electrochemical barrier on the surface of the reinforcement.



761 LANKOSTEEL

- ▶ Rapid penetration into concrete
- ▶ Solvent-free
- ▶ No film formation
- ▶ No alteration of concrete appearance
- ▶ Compliant with principle 11, method 11.3 of standard EN 1504-9
- ▶ Minimal 761 LANKOSTEEL concentration of 0.001% of concrete weight at the surface of the reinforcement



ANCHORING SYSTEMS



MICRO CONCRETES AND CHEMICAL GROUTS FOR ANCHORING AND BEDDING APPLICATIONS

ANCHORING, SEALING & BEDDING MORTARS



700 CLAVEXPRESS

- ▶ Fast setting and hardening
- ▶ Thickness: 10 to 50mm
- ▶ Sealing of rebars, anchoring bolts
- ▶ High pull-out resistance after 24 hours
- ▶ High mechanical strength
- ▶ Compliant with EN1504-6



708 CLAVEX PLUS MB

- ▶ High mechanical strength
- ▶ Suitable for supporting heavy machinery, rails
- ▶ Thickness: 40 - 150mm
- ▶ Excellent resistance to sea water, sulphated water and de-icing salts
- ▶ No chlorides
- ▶ Pumpable
- ▶ Compliant with EN1504-6



705 CLAVEX PLUS

- ▶ Rapid setting and hardening
- ▶ High mechanical resistance
- ▶ Suitable for anchoring rebar, supporting machinery
- ▶ Excellent resistance to sea water, sulphated water and de-icing salts
- ▶ Compliant with EN1504-6



709 CLAVEXPRESS MB

- ▶ Large bedding applications of industrial equipment
- ▶ Bedding of bridge bearings
- ▶ Rapid setting AND HARDENING
- ▶ Shrinkage compensated
- ▶ Compliant with EN1504-6



TECGRIP CAS VINYL ESTER

- ▶ Single component resin in a cartridge
- ▶ Anchoring of threaded rebar, rods and studs
- ▶ Rapid return to work even at low temperatures
- ▶ Excellent chemical resistance
- ▶ No expansive forces on substrates
- ▶ Use in all orientations
- ▶ Up to 50 year working life of anchor
- ▶ Suitable for Underwater Applications
- ▶ Compliant with ETA-13/0421



SCAN THE QUICK RESPONSE (QR CODE)



TO WATCH
THE VIDEO

PAREX ALSO PROVIDES ON-SITE TECHNICAL EXPERTISE & SUPPORT

More than 30 years, our regional network of specialized technicians has been providing the very best back-up service and technical advice to customers throughout the UK.

Technical support:

- ▶ Provide specialist support on a project by project basis
- ▶ Provide written recommendations & guidance

Getting started:

- ▶ Our technicians will be happy to provide on-site support and advice on specific applications

Technical Info service

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Download our Interactive Product Guide

PAREX

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