

Norcure® Chloride Extraction

The Norcure chloride extraction treatment is a system for electrochemical extraction of corrosive chloride from concrete

Description of chloride extraction

Norcure chloride extraction is a treatment which:

- Extracts chloride ions from contaminated concrete
- Reinstates the passivity of steel reinforcement
- Increases structural service life

Chloride extraction is carried out by applying a regulated current in order to create a safe electric field between the reinforcement in the concrete and a temporary, externally mounted anode mesh. During the treatment negatively charged chloride ions are driven from the concrete by an induced positive/negative field effect. Concurrent to the chloride ion removal process, electrolysis at the reinforcement surface produces a high pH environment which re-passivates the steel within the effective treatment zone.

Advantages

Norcure chloride extraction offers major advantages over other methods of concrete repair.

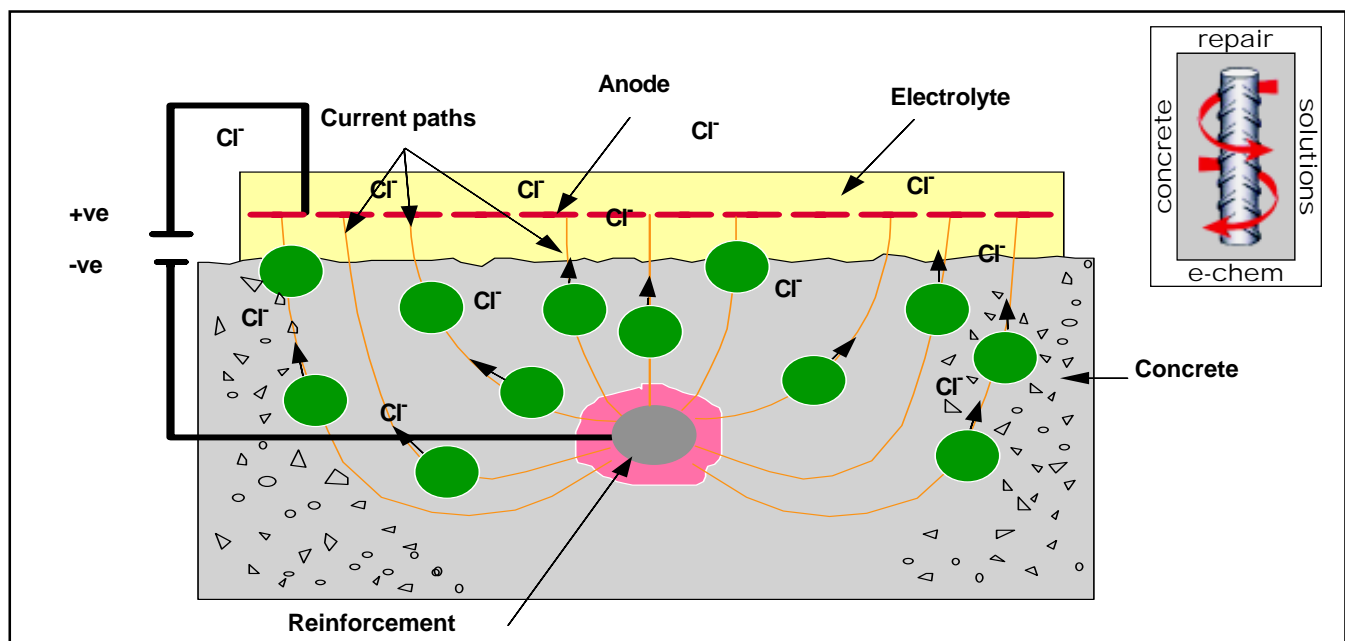
- The cause of corrosion is addressed and removed
- The success of the treatment is easily provable by simple tests
- All rebar within the effective treatment zone is re-passivated.
- The non-destructive nature of the treatment which means:

- major time-savings
- no noise, dust or environmental pollution
- no need for expensive structural support
- no risk of inducing micro-cracks
- minimum disturbance to structure users or residents
- The chloride extraction process is silent
- The need for permanent electronic monitoring is eliminated
- Architectural and exposed aggregate finishes can be maintained

General technical specification

Anode	: Conductive mesh temporarily mounted on concrete surface
Cathode	: Existing steel reinforcement
Electrolyte	: Norcure ECE electrolyte, an aqueous pH controlled solution
Current density	: Typically 1 A/m ² of concrete surface
Treatment time	: Typically 3-8 weeks depending upon steel, concrete density, concrete cover and chloride levels
Applied voltage	: Between 10 and 40 V DC
pH restoration	: >10

Mechanisms of chloride extraction



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Preparation prior to treatment

- Any existing surface finishes shall be removed
- Any special characteristics of the concrete/structure shall be determined
- Any cracks, spalls and delaminations shall be located and repaired using an approved product from the Renderoc Xtra range
- All metallic features on the concrete surface shall be located and insulated, or removed
- The thickness of the concrete cover shall be determined and built up to a minimum of 25 mm if necessary
- Reinforcement continuity shall be examined and, if necessary, improved to give full continuity

Treatment

Installation

- Treatment sections shall be identified to ensure even current distribution within each section
- Electrical connections to the reinforcement shall be established
- Test locations for concrete sampling shall be determined and marked
- The chosen anode system, consisting of an anode mesh and an electrolyte reservoir, shall be installed

- Electrical connections to the anode mesh shall be established
- The leads from the reinforcement shall be connected to the negative pole of the rectifier unit(s).
- A voltage shall be adjusted to give approximately 1 Amp per square metre of concrete surface
- Current, voltage and efficiency of the anode system shall be controlled and, if necessary, adjusted throughout the treatment
- Electrolyte and pH levels controlled throughout treatment period

Testing

- Concrete samples shall be taken at intervals to analyse for chloride content

Post-treatment

- When sufficient chloride extraction is achieved, the anode system shall be removed and the concrete surface cleaned and allowed to dry
- If so required, the concrete surface shall be treated with an approved, compatible protective/decorative coating system

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