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 repassivates 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 repassivated.
- 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**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
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<tbody>
<tr>
<td>Anode</td>
<td>Conductive mesh temporarily mounted on concrete surface</td>
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<td>Cathode</td>
<td>Existing steel reinforcement</td>
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<tr>
<td>Electrolyte</td>
<td>Norcure ECE electrolyte, an aqueous pH controlled solution</td>
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<td>Current density</td>
<td>Typically 1 A/m² of concrete surface</td>
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<tr>
<td>Treatment time</td>
<td>Typically 3-8 weeks depending upon steel, concrete density, concrete cover and chloride levels</td>
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<td>Applied voltage</td>
<td>Between 10 and 40 V DC</td>
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<td>pH restoration</td>
<td>&gt;10</td>
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</tbody>
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**Mechanisms of chloride extraction**

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- **Norcure Chloride Extraction**
- **constructive solutions**
Preparation prior to treatment

- Any existing surface finishes shall be removed
- Any special characteristics of the concrete/structure shall be determined
- Any cracks, spills 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

Important note:

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Regional Offices

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<thead>
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<th>Location</th>
<th>Address</th>
<th>Phone</th>
<th>Fax</th>
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<tbody>
<tr>
<td>Bangalore</td>
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<td>++91 80-22233474</td>
<td><a href="mailto:india@fosroc.com">india@fosroc.com</a></td>
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<td>Mumbai</td>
<td>208/209, Persepolis</td>
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<td>Delhi</td>
<td>First floor, 1/2 East Patel Nagar</td>
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<td>Kolkata</td>
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