The Norcure realalkalisation system is an electrochemical treatment for reinstating passive layer around steel reinforcing.

**Description of alkalisation**

Norcure realalkalisation is a non-destructive treatment which:

- Restores the alkalinity of carbonated concrete; and
- Reinstates the passivity of steel reinforcement
- Increases structural service life

Realalkalisation is carried out by applying a safe electric current between the reinforcement in the concrete and a temporary, externally mounted anode mesh. During treatment, an alkaline electrolyte solution is transported into the concrete by a process of electro-osmosis, increasing the alkalinity of the cover zone. At the same time, electrolysis at the reinforcement surface produces a high pH environment, which repassivates the steel reinforcement.

**Advantages**

Norcure realalkalisation offers major advantages over other methods of concrete repair.

- The cause of reinforcement corrosion is addressed and removed
- The success of the treatment is easily provable by simple tests
- All rebar within the realalkalised 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
  - minimal disturbance to structure users or residents
- The realalkalisation process is silent
- The need for permanent electronic monitoring is eliminated
- Architectural and exposed aggregate finishes can be maintained

**Mechanisms of realalkalisation**

[Diagram showing the process of realalkalisation with anode, electrolyte, concrete, and reinforcement.]

- **Anode**
- **Electrolyte**
- **Concrete**
- **OH⁻**
- **Reinforcement**
### General technical specification

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
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</thead>
<tbody>
<tr>
<td><strong>Anode</strong></td>
<td>Conductive mesh temporarily mounted on concrete surface</td>
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<tr>
<td><strong>Cathode</strong></td>
<td>Existing steel reinforcement</td>
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<tr>
<td><strong>Electrolyte</strong></td>
<td>Norcure ERA electrolyte, an aqueous pH controlled solution</td>
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<tr>
<td><strong>Current density</strong></td>
<td>Typically 1 A/m² of concrete surface</td>
</tr>
<tr>
<td><strong>Treatment time</strong></td>
<td>Typically 7 - 10 days although dependent upon steel and concrete density</td>
</tr>
<tr>
<td><strong>Applied voltage</strong></td>
<td>Between 10 and 40 V DC</td>
</tr>
<tr>
<td><strong>pH restoration</strong></td>
<td>&gt; 10</td>
</tr>
</tbody>
</table>

### 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 alkaline 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)
- The leads from the mesh shall be connected to the positive 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

### Testing

- Concrete samples shall be taken at intervals to determine the degree of realkalisation
- Phenolphthalein indicator shall be used to measure the depth of realkalisation

### Post-treatment

- When sufficient realkalisation 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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