**SMART ZINC® Hybrid Anode**

**Smart Zinc® Hybrid Anodes are self-powered dual phase anodes for incipient anode prevention and global corrosion protection**

Impressed Current Cathodic Protection (ICCP) is a proven technology for the corrosion protection of reinforced concrete structures. The technology is highly suited for structures located in harsh marine environments, and for structures with high concrete resistivity. However, once an ICCP system is installed, there are permanent maintenance and monitoring requirements during the life of the system.

Galvanic cathodic protection involves the installation of alkali-activated zinc anodes embedded in concrete. The difference in potential between the zinc and the steel causes a protection current to flow from the zinc to the steel. There is no maintenance associated with galvanic anode protection systems, however, protection levels may be insufficient in aggressive marine environments, and for structures with high concrete resistivity.

The Smart Zinc® Hybrid Anode combines the high-level performance of an ICCP system, with the long-term maintenance-free characteristics of galvanic cathodic protection. The single-unit system does not require complex wiring or an external DC power supply and can be installed in the concrete with direct connection to the embedded rebar.

When installed, the inbuilt impressed current component provides an initial phase of high charge density to provide cathodic protection and / or passivate active corrosion (phase 1). Then, the anode automatically switches to a galvanic cathodic prevention phase, where galvanic cathodic prevention current is provided to the reinforcing steel. This can maintain steel passivity and provide long-term, maintenance-free corrosion protection (phase 2).

For most structures it is the concrete cover that is the area of high chloride concentration. For optimum protection, the anode is designed for installation within the concrete cover. The spacing of the anodes is determined by the steel density, corrosion activity of embedded rebar, and the level of chloride concentration within the concrete.

For concrete elements with low to medium levels of corrosion activity, Smart Zinc® Hybrid Anode SZ 2.5/100 can be installed at the concrete edge for incipient anode prevention, or in chases within the concrete cover for global corrosion protection. Provide sufficient cover over installed anodes. The anode dimensions are 30 x 30 x 160 mm.

For concrete elements with medium to high levels of corrosion activity, Smart Zinc® Hybrid Anode SZ 16/200 can be installed at the concrete edge for incipient anode prevention, or in chases within the concrete cover for global corrosion protection. Provide sufficient cover over installed anodes. The anode dimensions are 46 x 46 x 200 mm.

<table>
<thead>
<tr>
<th>Anode Type <strong>Dimensions mm</strong></th>
<th>ICCP phase*</th>
<th>Galvanic phase*</th>
</tr>
</thead>
<tbody>
<tr>
<td>SZ 2.5 / 100 (30 x 30 x 160)</td>
<td>2.5 A h</td>
<td>100 g zinc</td>
</tr>
<tr>
<td>SZ 16 / 200 (46 x 46 x 200)</td>
<td>16 A h</td>
<td>200 g zinc</td>
</tr>
</tbody>
</table>

*Nominal capacity

**Design and Technical Support**

The successful implementation of corrosion protection for reinforced concrete structures is a complex process. It is the responsibility of the design / corrosion engineer to perform all required electrochemical testing including chloride analysis, continuity testing, potential mapping and resistivity testing for each individual structure to determine the most appropriate corrosion protection system.

Savcor Products Australia (SPA), in conjunction with our partners, provide full technical support associated with the use of Smart Zinc® anode technology.

The requirements for the installation of Smart Zinc® anodes include cables and connections for system installation which are available through Savcor Products Australia. The typical design calculations for these galvanic anodes are available through Savcor Products Australia. Further, SPA provides technical support through our local corrosion consultants in Australia related to other aspects such as materials selection and system design.