

TECHNICAL DATA SHEET

Zinc Layer Anode

A self-contained, durability enhancement system, for atmospherically exposed reinforced concrete. Combining the benefits of active electrochemical control from **cathodic protection** with passive environmental and **barrier protection** from surface shielding and protective coatings.

Zinc Layer Anode (ZLA) consists of a high purity zinc foil, complete with an ion-conductive, auto moistening, humectant/activator/adhesive layer. The zinc foil is impermeable to gasses/moisture and the adhesive layer provides direct electrochemical contact between the foil and the concrete surface enabling **galvanic cathodic protection** of embedded reinforcement.



When connected to the embedded reinforcement and in contact with the concrete surface, the zinc foil corrodes at the humectant/activator/adhesive layer and provides **galvanic cathodic protection** to the embedded reinforcement.

ZLA is capable, of stopping and preventing corrosion of reinforcement within chloride contaminated or carbonated structures, preventing the need for removal and replacement of sound, undamaged chloride contaminated or carbonated concrete.

Where installed with monitoring facilities, ZLA can be monitored and evaluated against the cathodic protection criteria listed within BS EN ISO 12696.

The complete anode system may be coated with a suitable coating material, to prevent surface corrosion of the anode, ensure the highest anode efficiency and improve concrete protection by restricting oxygen, carbon dioxide, water and chloride contaminated water access to the repaired structure.

ZLA does not contain any chlorides or chemicals which are harmful to the structure, personnel or the environment.

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TECHNICAL DATA SHEET

About

The surface mounted galvanic zinc foil anode is “glued” to the concrete surface by the adhesive gel and is then anchored to the concrete using non-metallic fixings at appropriate intervals to prevent surface detachment.



When installed onto the surface of atmospherically exposed concrete and electrically connected to the embedded reinforcement, ZLA provides active corrosion protection (**cathodic protection**) to the embedded reinforcement without the need for external AC or DC power.

When installed onto the surface of atmospherically exposed concrete, ZLA provides passive protection (**barrier control**) to the concrete structure, reducing exposure to the atmosphere and preventing further contamination of the concrete.

ZLA is a proven, effective method which meets the requirements of BS EN 1504 Part 9 Principle 10 (**cathodic protection** by applying an electrochemical potential) and provides benefits in line with Principal 7 (preserving or restoring **passivity**) of the embedded reinforcement.

When used in conjunction with a coating, the ZLA system, provides added benefits in line with BS EN 1504 Part 9 Principle 8 (increasing resistivity by limiting moisture content to the surfaces) and Principal 9 (cathodic control by limiting oxygen content at the cathode by surface coatings).

Capable of stopping and preventing concentration cell corrosion (incipient anodes), the application of ZLA can limit or prevent the need for removal and replacement of sound undamaged chloride contaminated or carbonated concrete.

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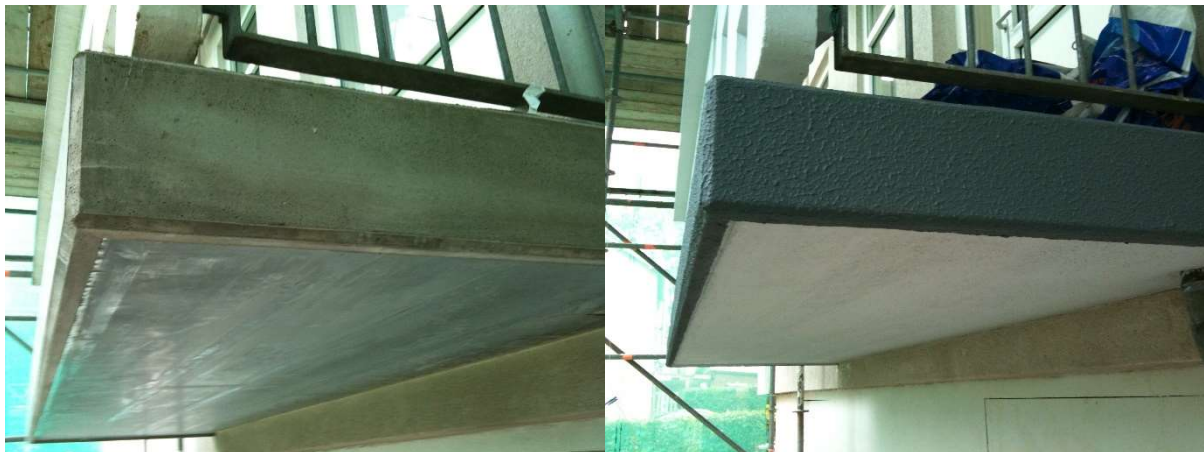
Uses

ZLA is suitable for protecting atmospherically exposed reinforced concrete structures suffering from chloride or carbonation induced reinforcement corrosion and resulting concrete deterioration.

The ZLA system provides an alternative to impressed current cathodic protection, galvanic/hybrid and galvanic cathodic protection using discrete embedded galvanic anodes, or localised embedded galvanic anodes for patch repair enhancement.

It can be used in conjunction with concrete repairs, to provide **structure life extension** and **deterioration control** of existing damaged structures.

It can be used to provide **durability enhancement** or deterioration prevention, when installed in the early life of a structure, to limit contamination and prevent the onset of corrosion related deterioration.



It is suitable for use on **high risk elements** like pre-stressed and post tensioned structures, as it will not exceed the potential limits listed within BS EN ISO 12696, and requires no further potential limitation or control during operation.

It can be used locally to provide patch repair enhancement and prevent incipient anode formation for patch repairs in chloride contaminated concrete or when incorporating old chloride contaminated structures into a new build.

When surface applied, it is easy to install, repair and replace, the adhesive gel is surface tolerant and does not require specific concrete surface preparation. Offering an alternative to overlays and drilled in anodes, limiting structural impact associated with increased dead load or large and frequent drilled holes.

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TECHNICAL DATA SHEET

Technical Benefits

ZLA can be installed as a stand-alone system connected directly to the reinforcement or provided with embedded monitoring facilities to meet the monitoring requirements listed within BS EN ISO 12696 - Cathodic Protection of Steel in Concrete.

ZLA offers a more uniform level of protection when compared with other embedded galvanic, galvanic / hybrid protection systems or systems based on barrier control alone.

The large surface area of the anode provides a low anode to cathode resistance, ensuring the highest protection current delivery under the natural zinc to steel driving voltage.

The humectant/activator/adhesive layer enables high dissolution and mobility of the zinc corrosion product, preventing loss of performance, typically found with embedded galvanic anode systems.

Once installed ZLA, provides multi-staged protection which effectively stops and prevents concrete deterioration resulting from reinforcement corrosion.

The protection afforded by ZLA includes:

- Stopping corrosion of the reinforcement by delivering cathodic protection
- Promotes passive film healing at corrosion sites on the embedded reinforcement by producing hydroxide
- Maintains passive film stability by delivering cathodic prevention to non-corroding or re-passivated reinforcement
- Reduces exposure to the environment, thereby reducing the rate of aggressive chemical penetration into the concrete surface and rate of deterioration.
- Reduces the rate of oxidation of existing corrosion products and the resulting risk of concrete spalling and cracking due to expansive corrosion products
- Increase concrete resistivity by isolating the concrete from water and moisture in the surrounding environment
- Consumes water and oxygen within the concrete through electrochemical reactions and prevents gas and moisture permeation of the concrete surfaces from the external environment

ZLA is available in two different thicknesses, 0.250mm or 0.450mm to suit the design life and current demand requirements.

The system is easy to install, requires no additional AC or DC power for operation and is relatively maintenance free.

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TECHNICAL DATA SHEET

Item	Description	Unit	Value
Zinc Foil	Composition	% Zinc	99.95
ZLA250	Thickness	mm	0.250
	Weight	g/m ²	1750
	Weight with adhesive (typical)	g/m ²	2650
ZLA450	Thickness	mm	0.450
	Weight	g/m ²	3150
	Weight with adhesive (typical)	g/m ²	4050
Adhesive gel	Thickness	mm	0.900 (+/- 100)
	Weight	g/m ²	900
Backing Paper	PET		
	Thickness	mm	0.075 ± 5
Adhesion to Concrete or Zinc	10 hours after application	MPa	> 0.125
	48 hours after application	MPa	> 0.125
	72 hours after application at 20°C	MPa	> 0.125
	72 hours after application at 50°C	MPa	> 0.125
Adhesive gel	Volume resistivity	Ohm.m	<10,000
Application temperature	Minimum	°C	+ 4
Operational temperature	Minimum	°C	+ 4
	Maximum	°C	50

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