

Embedded galvanic anode units for corrosion control

Description

Galvashield CC embedded galvanic anode units are used to control on-going corrosion and to prevent the initiation of new corrosion activity in concrete structures. Galvashield CC consists of a sacrificial zinc anode core that is activated by the surrounding specially formulated precast cementitious mortar. The cylindrical unit, available in a variety of standard sizes, is quickly and easily installed into concrete that is mechanically sound but has ongoing corrosion activity. Once installed, the zinc anode corrodes preferentially to the surrounding rebar, thereby providing galvanic corrosion control to the adjacent reinforcing steel. Custom size units are available for specific project needs.

Applications

- Balconies
- Columns and beams
- Bridge decks
- Parking garages
- Piers and wharfs
- Prestressed concrete
- Post-tensioning anchors

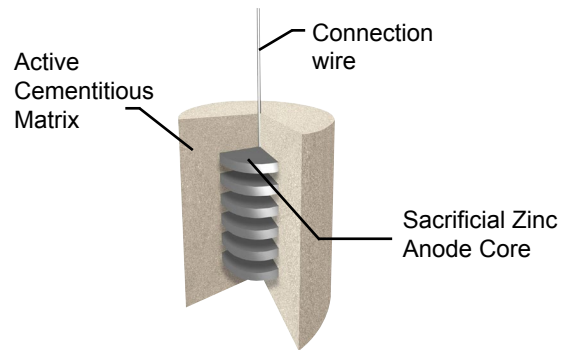
Features and Benefits

- Proven technology - supported by independent test program.
- Focused protection - discrete anodes can be installed to provide corrosion protection in areas with high corrosion potentials or active corrosion.
- Economical - save money by only protecting the remaining chloride-contaminated (unrepaired) areas.
- Versatile - effective in chloride-contaminated and carbonated concrete. Can be used for both conventionally reinforced and prestressed or post-tensioned concrete.
- User friendly - installation is quick and easy.
- Low maintenance - requires no external power source or system monitoring.
- Measurable - anode performance can be easily monitored if required.
- Long lasting - 10 to 20 year service life* reduces the need for future repairs.

*As with all galvanic protection systems, service life is dependent upon a number of factors including reinforcing steel density, concrete conductivity, chloride concentration, humidity and anode spacing.

Specification

Embedded galvanic anodes shall be Galvashield CC (specify product number, ie. CC65), as supplied by Parchem. Galvashield CC is a pre-manufactured unit consisting of zinc in compliance with ASTM B418-95a Type I cast around an integral bright steel tie wire for making connection to the reinforcing steel and encased in an activated cementitious mortar with pH of 14 or greater. The cementitious mortar around the zinc anode shall contain no chlorides or other corrosive constituents detrimental to the reinforcing steel as per ACI 222R.

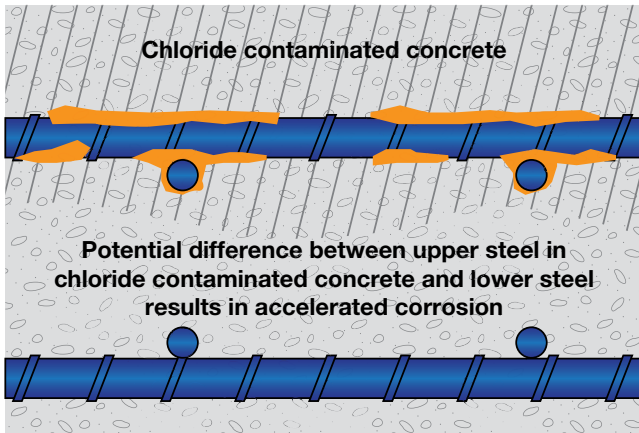


Cut-away of Galvashield CC

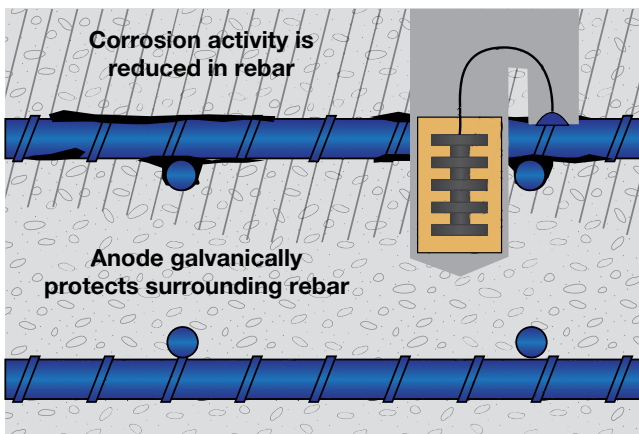
Level of protection	Description	Galvashield LJ
Corrosion Prevention	Preventing new corrosion activity from initiating	✓
Corrosion Control	Significantly reducing ongoing corrosion activity	✓
Cathodic Protection	Highest level of protection intended to stop on-going corrosion activity	

How It Works

When two dissimilar metals are coupled together in an electrolyte, the metal with the higher potential for corrosion (more electronegative) will corrode in preference to the more noble metal. In concrete repair applications, the zinc core of the Galvashield CC unit will corrode in favor of the reinforcing steel, thus providing corrosion control to the adjacent reinforcing steel.



Chloride contamination causes corrosion in reinforced concrete



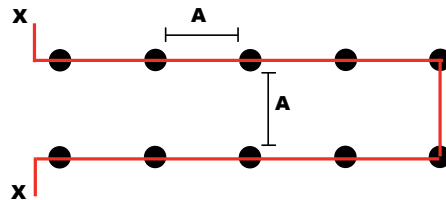
Galvashield CC mitigates active corrosion

Galvashield CC65 & CC135

Steel density ratio (steel surface area/ concrete surface area)	Maximum grid dimensions*
< 0.2	700mm
0.21 - 0.4	600mm
0.41 - 0.54	500mm
0.55 - 0.67	450mm
0.68 - 0.80	400mm
0.81 - 0.94	380mm
0.95 - 1.07	355mm
1.08 - 1.2	335mm

Galvashield CC100

Steel density ratio (steel surface area/ concrete surface area)	Maximum grid dimensions*
0.55 - 0.94	500mm
0.95 - 1.17	450mm
1.18 - 1.41	400mm
1.42 - 1.64	380mm
1.65 - 1.88	355mm
1.89 - 2.11	335mm



- X Rebar Connection
- Galvashield CC units
- A Grid Dimension
- Interconnecting Cable

Design Criteria

Standard Units

Unit type	Description	Unit size diameter x length	Minimum hole size diameter x length
Galvashield CC65	Standard unit for moderate steel density	42 x 62 mm	50 x 95 mm
Galvashield CC100	Larger unit for higher steel density	46 x 100 mm	50 x 130 mm
Galvashield CC135	Slim-fit for congested reinforcement	29 x 135 mm	32 x 165 mm

Installation Instructions

The location and spacing of the Galvashield CC units shall be on a grid pattern as specified by the engineer. Using a rebar locator, locate all existing steel within the area designated for protection and mark areas to drill unit installation holes. When possible, units should be installed a minimum of 100 mm from reinforcing grid.

Series Connection

A single circuit shall contain no more than 10 Galvashield CC units. Drill a minimum of 12 mm rebar connection holes per string of anodes. Saw cut a single continuous groove approximately 6 mm wide by 12 mm deep into the concrete to interconnect rebar connection holes and anode connection holes.

Galvashield® CC

Individual Connection

Drill one rebar connection hole per unit location. Saw cut a groove approximately 6 mm wide by 12 mm deep into the concrete to interconnect the rebar connection hole and anode connection hole.

***Please refer to the Galvashield CC Installation Guide for further details.**

Reinforcing steel connections should be made using the Rebar Connection Kit. Place the weighted end of the connector into the drilled hole until the steel coil contacts the reinforcing steel. Feed the steel connector wire through the Setting Tool and set into place by striking with a hammer.

Connect the units directly to the rebar connection wire using the supplied wire connector. If installing in series, connect the units to the interconnecting cable with a wire connector (cable and wire connectors are available as the Anode Connection Kit). Verify continuity between unit locations and rebar connections with a multi-meter. A resistance of 1 ohm or less is acceptable.

Drill holes as per the dimensions listed above to accommodate the anodes. Presoak the units for a minimum of 10 to a maximum of 20 minutes in a shallow water bath. Galvashield CC bedding mortar should be used to install the still wet units into presoaked (saturated-surface dry) holes. Place the mixed embedding mortar into the bottom 2/3 of each hole and slowly press in the unit allowing the mortar to fill the annular space ensuring there are no air voids between the unit and the parent concrete. The minimum unit cover depth shall be 20 mm.

Place wires into grooves and top off unit holes and saw cuts flush to the concrete surface with embedding mortar. Embedding mortar should be wet cured or cured with a curing compound and protected from traffic for 24 hours.

Precautions

Galvashield CC units are not intended to address or repair structural damage. Where structural damage exists, consult a structural engineer.

Galvashield CC anodes are designed to provide galvanic corrosion control. Corrosion control products significantly reduce or stop on-going corrosion. Concrete repairs should be completed using Galvashield XP units around the boundary of the patch prior to installing Galvashield CC units in the remaining unrepaired areas.

For more information on corrosion mitigation strategies, contact Parchem.

Important notice

A Safety Data Sheet (SDS) and Technical Data Sheet (TDS) are available from the Parchem website or upon request from the nearest Parchem sales office. Read the SDS and TDS carefully prior to use as application or performance data may change from time to time. In emergency, contact any Poisons Information Centre (phone 13 11 26 within Australia) or a doctor for advice.

Product disclaimer

This Technical Data Sheet (TDS) summarises our best knowledge of the product, including how to use and apply the product based on the information available at the time. You should read this TDS carefully and consider the information in the context of how the product will be used, including in conjunction with any other product and the type of surfaces to, and the manner in which, the product will be applied. Our responsibility for products sold is subject to our standard terms and conditions of sale. Parchem does not accept any liability either directly or indirectly for any losses suffered in connection with the use or application of the product whether or not in accordance with any advice, specification, recommendation or information given by it.

Packaging

Galvashield CC units	20 units per box
Galvashield CC bedding mortar	5kg bags, one bag per 20 units
Rebar Connection kit	20 rebar connectors per box
Anode Connection kit	15.2m insulation cable 25 wire connectors
Setting Tool	1 unit per box

Storage

Store in dry conditions in the original unopened boxes. Avoid extremes of temperature and humidity. Units should be installed within one year.

Health and Safety

As with all cement-based materials, contact with moisture can release alkalis which may be harmful to exposed skin. Galvashield CC and Galvashield CC bedding mortar should be handled with suitable gloves and other personal protective equipment in accordance with standard procedures for handling cementitious materials. Mix left over water from the unit bath with cementitious material and dispose by normal means after hardening. Additional safety information is included in the Material Safety Data Sheet.

