

Vector™

Galvashield® CC

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 on-going 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

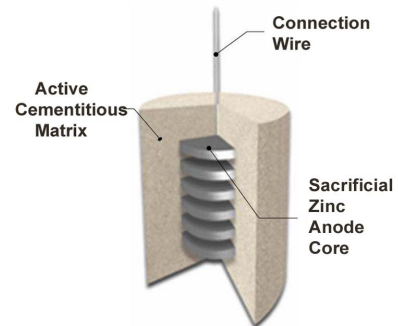
Features and Benefits

- **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.

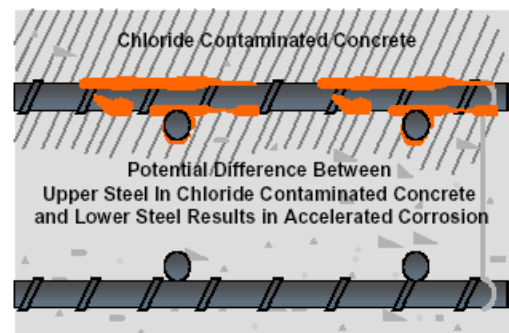
Specification

Embedded galvanic anodes shall be Galvashield CC (specify product number, ie. CC65), as supplied by Vector Corrosion Technologies. 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.

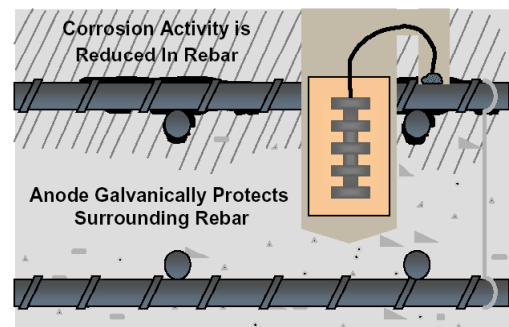


Cut-away of Galvashield CC

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



Chloride contamination causes corrosion in reinforced concrete



Galvashield CC mitigates active corrosion

Vector™ Galvashield® CC

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.

Design Criteria

Standard Units

Unit Type	Description	Unit Size diameter x length	Minimum Hole Size diameter x depth
Galvashield CC65	Standard unit for moderate steel density	1 3/4 x 2 1/2 in. (46 x 62 mm)	2 x 3 3/4 in. (50 x 95 mm)
Galvashield CC100	Larger unit for higher steel density	1 3/4 x 4 in. (46 x 100 mm)	2 x 5 1/8 in. (50 x 130 mm)
Galvashield CC135	Slim-fit for congested reinforcement	1 1/8 x 5 3/8 in. (29 x 135 mm)	1 1/4 x 6 1/2 in. (32 x 165 mm)

Galvashield CC65 and CC135

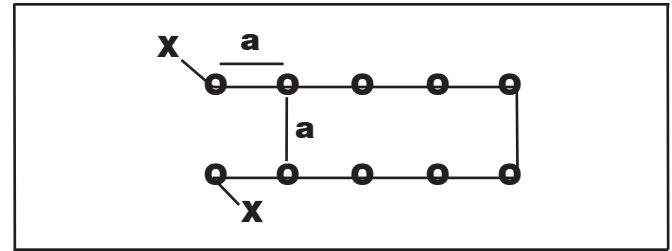
Steel density ratio (steel surface area/concrete surface area)	Maximum grid dimensions* in. (mm)
< 0.2	28 in. (700 mm)
0.21 - 0.4	24 in. (600 mm)
0.41 - 0.54	20 in. (500 mm)
0.55 - 0.67	18 in. (450 mm)
0.68 - 0.80	16 in. (400 mm)
0.81 - 0.94	15 in. (380 mm)
0.95 - 1.07	14 in. (355 mm)
1.08 - 1.2	13 in. (335 mm)

Galvashield CC100

Steel density ratio (steel surface area/concrete surface area)	Maximum grid dimensions* in. (mm)
0.55 - 0.94	20 in. (500 mm)
0.95 - 1.17	18 in. (450 mm)
1.18 - 1.41	16 in. (400 mm)
1.42 - 1.64	15 in. (380 mm)
1.65 - 1.88	14 in. (355 mm)
1.89 - 2.11	13 in. (335 mm)

*Maximum grid dimensions are based on typical conditions. Spacing should be reduced as appropriate for severe environments or to extend the expected service life of the anode.

Typical layout for series connection



- Galvashield CC units
- ✕ Minimum number of rebar connections
Interconnecting cable
- a Maximum spacing

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 4 in. (100 mm) from reinforcing grid.

Series Connection - a single circuit shall contain no more than 10 Galvashield CC units. Drill a minimum of two 1/2 in. (12 mm) rebar connection holes per string of anodes. Saw cut a single continuous groove approximately 1/4 in. (6 mm) wide by 1/2 in. (12 mm) deep into the concrete to interconnect rebar connection holes and anode connection holes.

Individual Connection - drill one rebar connection hole per unit location. Saw cut a groove approximately 1/4 in. (6 mm) wide by 1/2 in. (12 mm) deep into the concrete to interconnect the rebar connection hole and anode connection hole.

Reinforcing steel connections should be made using the Vector 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 Vector 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 Vector 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 Embedding 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 3/4 in. (20 mm).

Vector™

Galvashield® CC

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 Vector Corrosion Technologies.

Packaging

Galvashield CC units	20 units per box
Galvashield Embedding Mortar	11 lb. (5 kg) bags one bag per 10-20 units
Vector Rebar Connection Kit	20 rebar connectors per box
Vector Anode Connection Kit	50 ft. (15.2 m) insulated cable 25 wire connectors
Vector 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 Embedding 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.

Related Documents

A range of related Galvashield CC documents are available including independent product evaluations, installation instructions, specifications, project histories, applications, price list, MSDS etc. For more information, contact Vector Corrosion Technologies.

About Vector

Vector Corrosion Technologies is a member of the Vector Construction Group, a privately owned corporation with 11 offices throughout Canada and the United States. Vector takes pride in offering technically advanced cost effective solutions for concrete structures subject to corrosion damage and has earned numerous awards and patents for product innovation. As evidenced by the Corporate Safety and Environmental Policies, Vector is committed to a safe, healthy and sustainable environment.

3051-2009Apr01