

Vector®

Galvanode® VP

Halide-Activated Embedded Galvanic Anode Units

Description

The Galvanode VP embedded galvanic anode unit utilizes an innovative zinc anode core design surrounded by an enhanced formulated cement-based mortar to provide corrosion mitigation to reinforced concrete structures. The anode units are halide-activated (Type H) to keep the zinc active over the life of the anode. Once installed, the zinc anode core corrodes preferentially to the surrounding rebar, thereby mitigating corrosion in adjacent reinforcing steel.

Applications

- Mitigates incipient anode formation (halo effect) in patch repair
- Bridge widening and other structure modifications
- Slab replacements, expansion joint repairs and other interfaces between new and existing concrete
- Repair of epoxy-coated rebar

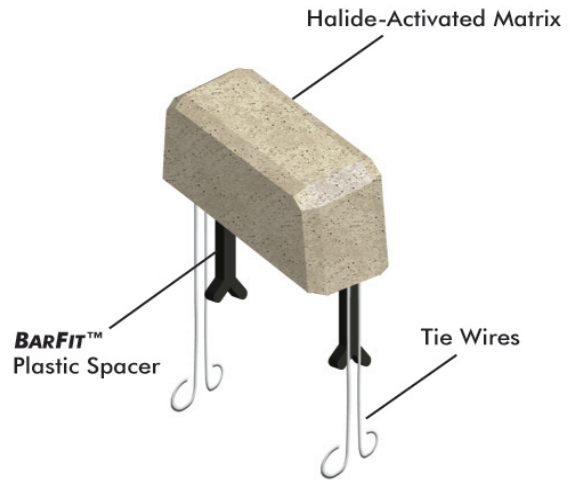
Features and Benefits

- **Economical** - low cost solution for corrosion mitigation of chloride contaminated and carbonated structures. Provides protection where it is needed the most, at the interface of the repair and the remaining contaminated concrete.
- **Type H anode** - halide-activated to maintain activity of zinc.
- **Performance** - patented in 2000, Galvanode VP is the original humectant-activated embedded galvanic anode. Typical current output of 0.5 to 1.0 mA after 120 days depending on steel density and environmental conditions.
- **User friendly** - quick and easy installation, Galvanode VP anode units incorporate extra long tie wires or the plastic BarFit™ spacer design to assist with secure anode placement and to ensure the anode is kept a minimum distance from the reinforcing steel.
- **Dependable steel connection** - utilizes steel tie wires to provide anode-to-steel connection which does not deteriorate over time. Does not use galvanized wires that may be subject to dissimilar metal corrosion over time.
- **Corrosion inhibitors** - Galvanode VP contains two different materials that inhibit corrosion of reinforcing steel.
- **Low maintenance** - requires no external power source or system monitoring.
- **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 Clause

Embedded galvanic anodes shall be pre-manufactured with 55 grams of zinc in compliance with ASTM B418 Type I cast around a pair of steel tie wires and encased in a halide-activated alkaline cementitious shell. Anode units shall be supplied with integral unsplined wires with loop ties for tying to the reinforcing steel. The anode units shall also contain plastic spacers to keep the anode a minimum of 1 ½ in (38 mm) away from the reinforcing steel.



Cut-away of Vector Galvanode VP

Level of Protection	Description	Galvanode® VP
Corrosion Prevention	Mitigates new corrosion activity from initiating	●
Corrosion Control	Significantly reduces on-going corrosion activity	
Cathodic Protection	Highest level of protection intended to stop on-going corrosion	

How It Works

When two dissimilar metals are coupled together in an electrolyte (in this case concrete), the metal with the higher potential for corrosion (zinc) will corrode in preference to the more noble metal (reinforcing steel). Galvanode VP-type anodes are embedded in concrete repairs to provide corrosion prevention to the reinforcing steel in the adjacent area.

Product Information	Anode Class	Anode Dimension	Zinc Mass (g)
Galvanode VP	Type HP	35 mm x 80 mm x 40 mm (1.4 in x 3.1 in x 1.6 in)	55

Anode Class

First Letter Activation Method (H-halide salt)
 Second Letter Application (P-corrosion prevention)



Vector® Galvanode® VP

Design Criteria

Anode Spacing for Low to Moderate Corrosion Risk (Chloride Content <0.8% or Carbonated Concrete)		
Steel Density Ratio	mm	in.
< 0.3	750	30
0.31 - 0.6	600	24
0.61 - 0.9	500	20
0.91 - 1.2	450	18
1.21 - 1.5	400	16
1.51 - 1.8	350	14

Anode Spacing for High Corrosion Risk (Chloride Content <0.8% - 1.5%)		
Steel Density Ratio	mm	in.
< 0.3	600	24
0.31 - 0.6	500	20
0.61 - 0.9	400	16
0.91 - 1.2	350	14
1.21 - 1.5	250	10
1.51 - 1.8	200	8
1.81 - 2.1	175	7

For Extremely High Corrosion Risk Applications (>1.5% Chloride) Contact Vector for Assistance.

* Steel Density Ratio = surface area of steel/surface area of concrete. Maximum anode spacing is based on typical conditions. Anode spacing should be reduced as appropriate for severe environments or to extend the expected service life of the anode.

Installation Instructions

Concrete shall be removed from around and behind all corroding rebar in accordance with good concrete repair practice such as ICRI Guideline R310.1R. Exposed reinforcing steel should be cleaned to remove all residual rust and concrete residue.

The anode units and repair material should be installed immediately following preparation and cleaning of the steel reinforcement. The location and spacing of the units shall be as specified by the designer (refer to design criteria). The units can be placed around the perimeter of the repair or on a grid pattern to protect a second mat of steel if required. Securely fasten the anode units to the side of the exposed rebar as close as practical to the surrounding concrete while maintaining at least 1½ in. (38mm) clearance from nearest reinforcing steel and ensuring that enough space remains to fully encapsulate the unit in the repair. The minimum cover of the units should be ¾ in. (20 mm).

Anode-to-steel continuity and steel-to-steel continuity within the patch should be verified with an appropriate meter; discontinuous steel should be tied to continuous bars using steel tie wire and re-tested. A value between 0 and 1 ohm should be achieved.

Repair Materials

For optimum performance, use repair materials with resistivity less than 15,000 ohm-cm. If higher resistivity repair material is to be used or if the resistivity of the repair material is unknown, pack Galvashield Embedding Mortar between the anode unit and the substrate to provide a conductive path to the substrate. Prior to the repair, pre-soak the concrete substrate and the anode units to achieve a saturated surface dry condition, then complete the repair. Do not soak the anode units for greater than 20 minutes.

Precautions

Galvanode VP units are halide-activated and contain substances that are corrosive to reinforcing steel and will remain in the structure over time. The anode units should be installed a sufficient distance away from reinforcing steel to minimize corrosion risk after the anodes are consumed or if the anodes become electrically disconnected from the reinforcing steel. Galvanode VP anode units are intended to provide localized corrosion mitigation and do not address or repair structural damage. Where structural damage exists, consult a structural engineer. To provide protection of a broader area, utilize Galvashield CC anode units on a grid pattern or consult Vector for further product recommendations. As with all cement-based materials, contact with moisture can release alkalis which may be harmful to exposed skin. Galvashield anode units should be handled with suitable gloves and other personal protective equipment in accordance with standard procedures for handling cementitious materials. Additional safety information is included in the Material Safety Data Sheet.

Packaging

Galvanode® VP anodes	20 units per box	13.8 lb. (4.1kg)
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Storage

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

About Vector

Vector Corrosion Technologies is a member of the Vector Construction Group, a privately owned corporation with 15 offices throughout North America. Vector takes pride in offering technically advanced, cost effective solutions for concrete structures subject to corrosive conditions and has earned numerous awards and patents for product innovation. Vector is committed to a safe, healthy and sustainable environment.

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Vector products are provided with a standard limited warranty against defects for a period of 12 months from the date of the sale. To obtain a complete copy of Vector's limited warranty, contact Vector or visit www.vector-corrosion.com/warranty.pdf. User shall determine the suitability of the products for the intended use and assume all risks and liability in connection therewith. For professional use only; not for sale to or use by the general public.

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