

Vector™

Galvashield® XP

Embedded Galvanic Anode Units for Corrosion Prevention

Description

Galvashield XP embedded galvanic anode units are used in concrete rehabilitation to prevent the formation of new corrosion sites adjacent to completed patch repairs. Galvashield XP consists of a sacrificial zinc anode core that is activated by the surrounding specially formulated cementitious mortar. The small puck-shaped unit [2.5 in. (64 mm) diameter by 1.1 in. (27 mm) high] is quickly and easily fastened to the exposed reinforcing steel. Once installed, the zinc anode core corrodes preferentially to the surrounding rebar, thereby providing galvanic corrosion prevention to the adjacent reinforcing steel.

Applications

- Patch repairs
- Bridge widening
- Joints between new and existing concrete
- Slab replacement
- Expansion joint repair
- Prestressed concrete
- Post-tensioning anchors
- Repair of epoxy-coated rebar

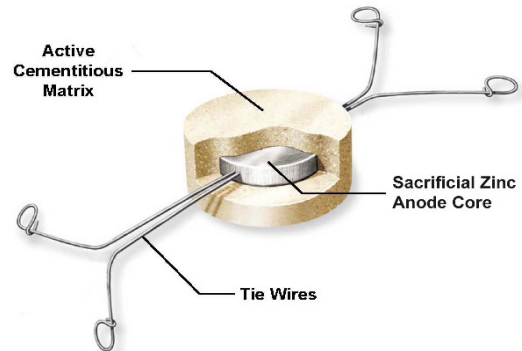
Features and Benefits

- **Proven technology** - supported by independent test program.
- **Focused protection** - provides localized corrosion protection where it is needed the most, at the interface of the repair and the remaining contaminated concrete.
- **Economical** - low cost method of providing galvanic corrosion prevention to extend the service life of concrete patch repairs.
- **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, requiring no special equipment or training.
- **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.

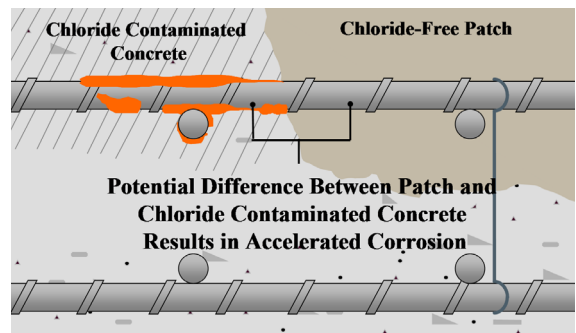
Specification

Embedded galvanic anode units shall be Galvashield XP as manufactured by Vector Corrosion Technologies. Galvashield XP is a pre-manufactured anode consisting of zinc in compliance with ASTM B418-95a Type I cast around integral bright steel tie wires for tying 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 corrosion constituents detrimental to the reinforcing steel as per ACI 222R.

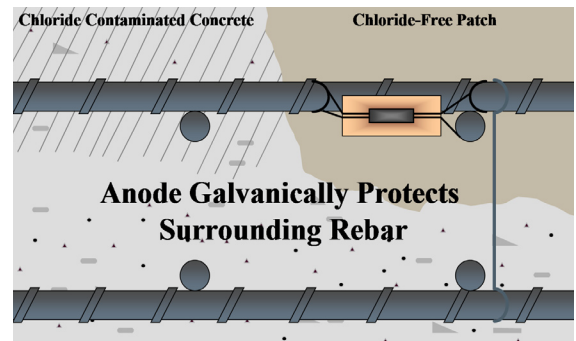


Cut-away of Galvashield XP

Level of Protection	Description	Galvashield XP
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	



"Ring Anode" Corrosion (without Galvashield XP)



Galvashield XP prevents "Ring Anode" Corrosion



Vector™

Galvashield® XP

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 anode core of the Galvashield XP unit will corrode in favor of the reinforcing steel, thus preventing the initiation of new corrosion activity in the adjacent reinforcing steel.

Design Criteria

Steel density ratio (steel surface area/concrete surface area)	Maximum spacing* between XP units in in. (mm)
< 0.3	30 in. (750 mm)
0.31 - 0.6	24 in. (610 mm)
0.61 - 0.9	20 in. (500 mm)
0.91 - 1.2	17 in. (430 mm)

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

Installation Instructions

Prior to installation, the "Installation Instructions" bulletin should be thoroughly examined for details on the placement and use of Galvashield XP units. Concrete shall be removed from around and behind all corroding rebar in accordance with good concrete repair practice (ICRI Guideline No. 03730). Securely fasten the unit to clean reinforcing steel using a suitable wire twisting tool to eliminate free movement, and to ensure a good electrical connection. Steel continuity within the patch should be verified with an appropriate meter. If discontinuous steel is present, re-establish continuity with steel tie wires. Following the unit installation, electrical connection between the unit tie wires and the clean reinforcing bar should be confirmed with an appropriate meter.

The location and spacing of the units shall be as specified by the designer (for more information refer to Design Criteria). Units are typically tied on the side or beneath the exposed rebar as close as practical to the surrounding concrete making sure that enough space is left to fully encapsulate the unit in the repair. Minimum cover over the units must be ¾ in. (20 mm). Units can be placed on a grid pattern throughout the repair to protect a second mat of steel if required. With the units in position, complete the repair using a suitable repair material with resistivity less than 15,000 ohm-cm. If higher resistance repair materials are to be used, pack Galvashield Embedding Mortar between the unit and the substrate to provide a conductive path to the substrate, then complete repair.

Precautions

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

Galvashield XP units are designed to provide localized galvanic corrosion prevention. To provide galvanic corrosion control over a broader area, Galvashield XP units can be used in conjunction with Galvashield CC units placed in a grid pattern in the remaining sound but contaminated concrete. For more information on corrosion mitigation strategies, contact Vector Corrosion Technologies.

Packaging

Galvashield XP units	20 units per box 11.5 lb. (5.2 kg) per box
Galvashield Embedding Mortar	11 lb. (5 kg) bag

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 XP 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.

Related Documents

A range of related Galvashield XP documents are available including independent product evaluations, installation instructions, guideline specifications, project histories, applications, pricing and MSDS. 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.