

Vector®

Galvanode® DAS Marine
Distributed Anode System for Installation in Wet Environments

Description

Galvanode DAS Marine is a distributed anode system designed to provide corrosion control or cathodic protection to concrete structures in marine environments. Galvanode DAS Marine anode units are alkali-activated which allows for enhanced protection that is not dependent on direct exposure to salt water. This allows the anode units to provide excellent protection to concrete elements exposed to a range of humidity conditions (submerged, splash zone, periodic spray and atmospheric). Galvanode DAS Marine anodes can be used in salt water, fresh water and non-marine applications where the anodes may be exposed to wet conditions during installation.

Galvanode DAS Marine anode length, spacing, electrical components and installation procedures are customized to meet specific project requirements. Galvanode DAS Marine anode units are rectangular in cross section [1-1/2 x 3-1/4 in. (38mm x 83mm)] and can be supplied in lengths of up to 6.5 ft (2.0 m). To provide global corrosion protection, evenly distribute Galvanode DAS Marine anode units over the entire structure or combine with bulk zinc anodes to protect submerged and unjacketed areas. The installed anode units are typically encased in reinforced concrete jackets or used in conjunction with concrete or mortar filled stay-in-place forms.

Applications

- Galvanic jackets for marine columns
- Bridges, piers and wharves
- Power and industrial plant rehabilitation
- Concrete jacketing/section enlargement
- Service life extension in severe service conditions
- Installation in wet conditions
- Conventionally reinforced and prestressed/post-tensioned concrete

Features and Benefits

- **Alkali-activated** - provides excellent protection in both wet and dry environments.
- **Design flexibility** - anode design and spacing can be customized to meet project performance requirements and service life objectives.
- **Economical** - anode units can be used in conjunction with locally supplied formwork.
- **Versatile** - 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** - system performance can be easily monitored if required.
- **Long lasting** - 20 to 40 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 ion concentration, temperature, humidity and anode spacing.



Galvanic anode system on bridge column prior to encasement in concrete jacket

Level of Protection	Description	Galvanode DAS Marine
Corrosion Prevention	Preventing new corrosion activity from initiating	•
Corrosion Control	Significantly reducing active corrosion	•
Cathodic Protection	Stopping active corrosion by applying on-going electrical current	•
Corrosion Passivation	Stopping active corrosion by changing the concrete environment around the steel	



Galvanode DAS Marine Anodes inside stay-in-place FRP Forms



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Galvanode® DAS Marine

Specification

Galvanic protection shall be provided using Galvanode DAS Marine anode units as manufactured by Vector Corrosion Technologies. The distributed galvanic anode units shall be alkali-activated with a pH greater than 14 and contain 2 lb. zinc per lineal foot (3kg/m) evenly distributed along the length of the unit. Zinc shall be in compliance with ASTM B418 Type II. The zinc shall be cast around a steel core which is continuous along the length of the unit. The anode unit shall be encased in a low resistivity precast cementitious mortar and shall include FRP reinforcing to resist expansion. Anode units shall not contain intentionally added constituents that are corrosive to reinforcing steel as per ACI 222R such as chlorides, bromides, or other halides.

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 applications, the Galvanode DAS Marine zinc anode unit corrodes in favor of the reinforcing steel and produces an electrical current that mitigates corrosion activity.

Design Criteria

Galvanode DAS Marine distributed anode system can be used for corrosion prevention, corrosion control or cathodic protection applications. Anode unit design and spacing are varied to meet project objectives. The anode units are nominally 1-1/2 x 3-1/4 in. (38mm x 83mm) in cross section with lengths up to 6.5 ft (2.0 m) and contain 2 lb. per foot (3 kg per meter) of high purity zinc. Galvanode DAS Marine anode unit spacing can vary from 12 in. (300 mm) to 30 in. (750 mm) on center depending upon project objectives, the structure configuration, severity of the service environment and expected service life of the anode components. For assistance with system design, please contact Vector Corrosion Technologies.

Installation Instructions

Galvanode DAS Marine distributed anode systems are used for a wide range of applications. Specific application procedures can be developed on a project-by-project basis. For additional information, please contact Vector Corrosion Technologies.

Precautions

Galvanode DAS Marine distributed anode system is not intended to address or repair structural damage. Where structural damage exists, consult a structural engineer. For optimum performance, encasement concrete resistivity should be less than 15,000 ohm-cm. Concrete with significant amounts of polymer or silica fume

may have higher resistivity. For applications where direct wetting will not occur during installation, consider Galvanode DAS (non-marine) anode units. For additional information, please contact Vector Corrosion Technologies.

Packaging

Galvanode DAS Marine Distributed Anode System	Custom-packaged based on project requirements. For additional information, contact Vector Corrosion Technologies.
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Storage

Store in dry conditions in the original unopened containers for up to one year from date of manufacture. System should be installed within one month of opening container. Take special precaution not to damage anode components during transportation or while handling. Avoid extremes of temperature and humidity.

Health and Safety

Contact with moisture can release alkalis which may be harmful to exposed skin. Anode components should be handled with suitable gloves and other personal protective equipment in accordance with standard procedures for handling cement and other alkaline materials. Additional safety information is included in the Material Safety Data Sheet.

Related Documents

A range of related documents are available including installation instructions, guideline specifications, project histories, applications, and MSDS. For more information, contact Vector Corrosion Technologies.

About Vector

Vector Corrosion Technologies takes pride in offering technically advanced, cost effective corrosion protection solutions to extend the service life and improve the durability of concrete and masonry structures around the world. Vector has earned numerous project awards and patents for product innovation and is committed to a safe, healthy and sustainable environment. For additional information or technical support, please contact any Vector office or our extensive network of international distributors.

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