

Vector®

Galvashield® N

Embedded Galvanic Anode Units for Corrosion Prevention in New Construction

Description

Galvashield N embedded galvanic anode units are used in new concrete construction to provide corrosion prevention to reinforcing steel. Galvashield N contains an innovative zinc anode core design surrounded by an enhanced formulated cement-based mortar. The anode unit is alkali-activated (Type A) with an internal pH of 14 or greater to keep the zinc active over the life of the anode while being non-corrosive to reinforcing steel. Galvashield N utilize 2G Technology™ to provide higher current output. The nominal anode dimension is 1 in x 5 in x 1 in (25mm x 125mm x 25mm).

Applications

- Newly constructed reinforced concrete
- Long service life structures
- Extreme exposure conditions
- Global protection of large areas or specific structural elements
- Targeted protection around critical areas where future corrosion is likely such as around construction and expansion joints

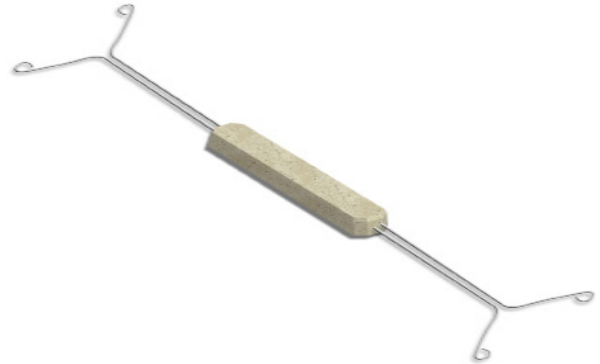
Features and Benefits

- **Proven technology** - Galvashield anodes have an extensive 10+ year track record in the field and have received British Board of Agrément (BBA) approval.
- **Type A anode** - alkali-activated to maintain activity of zinc while being non-corrosive to reinforcing steel .
- **2G Technology™** - provides enhanced current output and protection.
- **Cast zinc core** - provides high anode utilization in addition to secure long-term connection between the zinc and the lead wires.
- **Integral steel lead wires** - allows for quick and convenient anode installation. Provides dependable steel-to-steel contact with no intermediate materials such as galvanizing that may compromise the long-term electrical connection. Extra long lead wires allow the anode to be tied in the center of the reinforcing grid to provide more even current distribution.
- **Versatile** - can be used for both conventionally reinforced and prestressed or post-tensioned concrete.
- **Low maintenance** - requires no external power source or system monitoring.
- **Long lasting** - direct protection provided during the 10 to 20 years* anode life. Extended corrosion mitigation is provided after anode consumption due to positive electrochemical benefits.

*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 pre-manufactured with a nominal 60 grams of zinc in compliance with ASTM B418 Type II cast around a pair of 24 in. (600mm) long uncoated, non-galvanized steel tie wires and encased in a highly alkaline cementitious shell with a pH of 14 or greater. The cementitious shell shall contain no added sulfate nor shall it contain chloride, bromide or other constituents that are corrosive to reinforcing steel.



Galvashield N Anode Unit

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). While the anode unit is active, a small direct current provides steel polarization sufficient to mitigate the initiation of corrosion for a given amount of chloride as well as serving to repel the movement of chloride ions away from the reinforcing steel. During this time, beneficial hydroxyl ions are generated and other cations such as calcium are attracted to the steel. This electrochemical reaction provides a residual benefit to the structure as the additional hydroxyl ions assist in maintaining the steel's protective passive oxide film and creates a buffer against future chloride exposure after the anode is consumed.

Design Criteria

Galvashield N should be placed on a grid pattern with the anodes installed in the center of the reinforcing steel grid to allow for even current distribution.

Use a minimum of one anode per 2.7 ft² (0.25 m²) of steel surface area with a maximum spacing of 30 in (750 mm) between anodes.

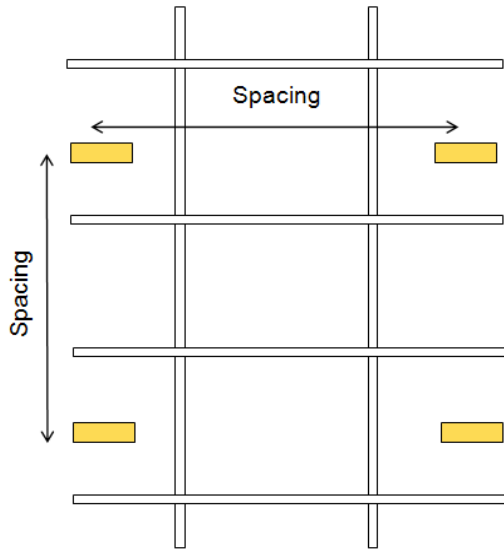
*Maximum spacing is based on typical conditions. Spacing should be reduced as appropriate for severe environments or to extend the expected service life of the anode.

Installation Instructions

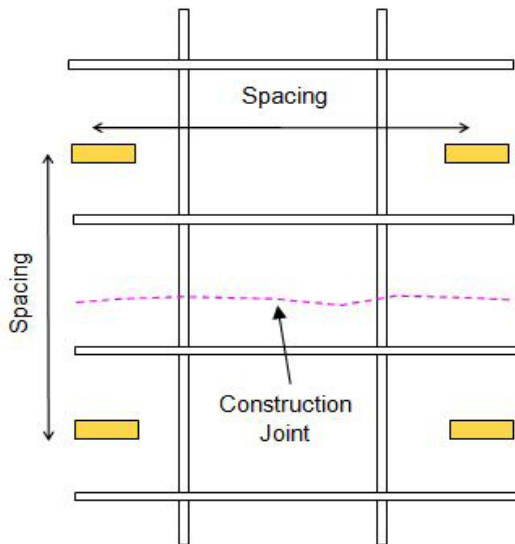
Galvashield N anode units should be installed after placement of reinforcing steel. The location and spacing of the units shall be as specified by the designer (refer to design criteria). The units are placed in the center of the reinforcing grid to provide even current distribution to the steel. The minimum concrete cover over the anode units should be 1 in (25mm).

Securely fasten the anode units by wrapping the two individual steel tie wires multiple times around the reinforcing steel in opposite directions. Using a rebar tie wire tying tool or pliers, grab the loop ties and twist the anode tie wires tight. Anode-to-steel and steel-to-steel continuity should be verified with an appropriate meter prior to concrete placement. A value between 0 and 1 ohm should be achieved. Discontinuous steel should be tied to continuous bars using steel tie wire and re-tested.

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For targeted protection along construction (cold) joints, install two lines of Galvashield N anodes, one on each side of the joint a maximum of 8 in (200mm) away from the joint.



Concrete Materials

Due to the protection provided by the Galvashield N anodes, highly resistive concretes are not required. If high resistance concrete is to be used, contact Vector. Do not use epoxy or polymer modified cement concretes.

Precautions

Do not allow the anode units to soak in water for greater than 20 minutes prior to concrete placement.

Packaging

Galvashield N Anodes	30 units per box 12.8 lb (5.8 kg)
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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 two years.

Health and Safety

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.

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.