

Galvashield® N Embedded Galvanic Anodes

For Corrosion Prevention in New Concrete Construction

SECTION 03700 – EMBEDDED GALVANIC ANODES

PART 1 GENERAL

1.1 Related Documents

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 Summary

A. This Section includes furnishing all labor, tools, materials, equipment and services necessary to properly install embedded galvanic anodes.

B. Embedded galvanic anodes are designed to provide targeted or global corrosion prevention in newly placed concrete. When placed at the appropriate spacing throughout the structure or targeted along construction joints or other critical areas of the structure, the anodes mitigate the formation of reinforcement corrosion in the newly placed concrete.

1.3 References

A. ACI Guideline No. 222 – Corrosion of Metals in Concrete

B. ASTM A615/A615M-09 Standard Specification for Deformed and Plain Billet-Steel Bar for Concrete Reinforcement

C ASTM B418-12 – Standard Specification for Cast and Wrought Galvanic Zinc Anodes

PART 2 PRODUCTS

2.1 Materials

1. Embedded galvanic anodes shall have the following nomination dimension 5 in. long by 1 in. high by 1 in. wide (125 mm x 25mm x 25 mm). The 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., with a nominal 60 grams of zinc in compliance 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 anode unit shall contain no added sulfate nor shall it contain chloride, bromide or other constituents that are corrosive to reinforcing steel. Anode units shall be supplied with integral unspliced wires for directly tying to the reinforcing steel. Embedded galvanic anodes shall be Galvashield® N available from Vector Corrosion Technologies (www.vector-corrosion.com) USA (813) 830-7566, Canada (204) 489-6300, or approved equal.

Application for approved equals shall be requested in writing two weeks before submission of project bids. Application for galvanic anode approved equals shall include verification of the following information:

1. A highly alkaline cementitious shell with a pH of 14 or greater

1. Provide a minimum of 10 years service life (in similar environment)
2. Contain no added constituents corrosive to reinforcing steel or detrimental to concrete, e.g. chloride, bromide, sulfates, etc.
3. Proven track record showing a minimum of 10 years satisfactory field performance for the technology
4. Anode units shall be supplied with solid zinc (ASTM B418) core cast around integral, non-spliced, uncoated, non-galvanized steel tie wires for wrapping around the reinforcing steel and twisting to provide a durable steel to steel connection between the tie wire and the reinforcing steel
5. Third party product technology evaluation, such as from Concrete Innovations Appraisal Service, BBA, etc.

B. The concrete shall be Portland cement-based. Highly resistive concretes are not required for corrosion protection. Do not use in conjunction with epoxy or polymer modified cement concretes.

C. Deformed bars for reinforcement shall be uncoated hot-rolled steel in accordance with ASTM A615/A615M, Grade 60 (Grade 400).

1. Deliver, store, and handle all materials in accordance with manufacturer’s instructions.

2.2 Storage

Deliver, store, and handle all materials in accordance with manufacturer’s instructions. Anode units shall be stored in dry conditions in the original unopened containers in a manner to avoid exposure to extremes of temperature and humidity.

PART 3 EXECUTION

3.1 If required, clean reinforcing steel of rust and other materials that would prevent sufficient electrical connection.

* 1. Do not allow the anodes to soak in water for more than 20 minutes.
  2. Galvanic anodes shall be installed at a two way grid spacing of *[x in. (x mm)]* as specified on the drawings.



3.4 Place the galvanic anodes as equally spaced as possible between the reinforcing bar grid while providing sufficient clearance to allow concrete to fully encase anode.

3.5 The tie wires shall be wrapped around reinforcing steel multiple times in the opposite directions and twisted tight to allow little or no anode movement during concrete placement. A minimum of 1 inch (25 mm) of concrete cover is expected is expected above and below the anode.

3.6 Electrical Continuity

A. Confirm electrical connection between anode tie wire and reinforcing steel by measuring DC resistance (ohm, Ω) or DC potential (mV) with a multi-meter.

B. Confirm electrical continuity of the reinforcing steel within the area to be protected. If necessary, electrical continuity shall be established by tying discontinuous steel to continuous steel using steel tie wire.

C. Electrical continuity between test areas is acceptable if the DC resistance measured with multi-meter is 1 Ω or less or the potential is 1 mV or less.



3.7 Manufacturer Corrosion Technician

A. The contractor will enlist and pay for a technical representative employed by the galvanic anode manufacturer to provide training and on-site technical assistance during the initial installation of the galvanic anodes. The technical representative shall be a NACE-qualified corrosion technician (Cathodic Protection Technician–CP2 or higher).

B. The qualified corrosion technician shall have verifiable experience in the installation and testing of embedded galvanic protection systems for reinforced concrete structures.

C. The contractor shall coordinate its work with the designated corrosion technician to allow for site support during project startup and initial anode installation. The corrosion technician shall provide contractor training and support for development of application procedures, verification of electrical continuity, and project documentation.

END OF SECTION