

Galvashield® XP2 / XP4

Tied-on sacrificial anode units for corrosion prevention and control

Description

Galvashield XP2 and Galvashield XP4 embedded galvanic anodes are used in concrete rehabilitation to prevent the formation of new corrosion sites around the perimeter of a repair area. The Galvashield units are simply fixed to the reinforcing steel by means of ties wires, which allow attachment in horizontal, vertical and overhead locations. Once installed, the zinc core corrodes preferentially to the surrounding reinforcement, providing corrosion prevention or corrosion control* aimed at eliminating 'incipient anode formation' or 'ring effect'.

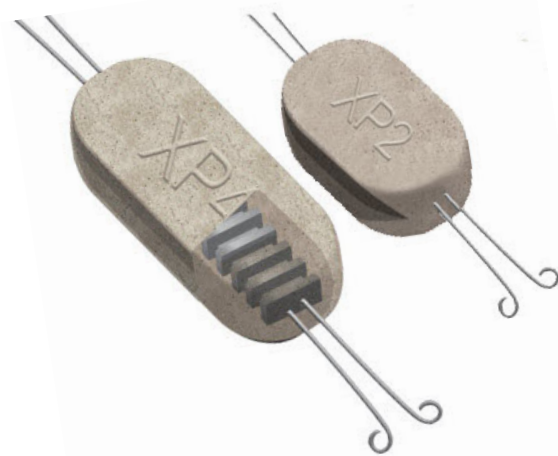
*depending on the unit selected

Typical applications

- General Patch Repairs.
- Pre-stressed Concrete.
- Joints between New and Existing Concrete.
- Post-tensioning Anchors.
- Severe Service Conditions.
- Slab Replacement.
- High Steel Densities.

Advantages

- **Proven Technology** - Galvashield has an extensive 10 year track record in the field.
- **Higher Performance** - XP2 has 2 times the performance of the standard XP while XP4 provides 4 times the output.
- **Focused Protection** - Provides localised corrosion prevention / control 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/ control to structures in demanding service conditions.
- **Versatile** - Suitable for chloride contaminated, pre stressed/ post tensioned and new concrete.
- **User Friendly** - Installation is quick and easy, requiring no special equipment or training.
- **Zero Maintenance** - Requires no external power source or system monitoring.
- **Measurable** - Anode performance can be monitored if required.
- **Long Lasting** – Up to 20 years service life* reduces the need for future repairs.



Level of Protection	Description	Galvashield®
Corrosion Prevention	Preventing new corrosion activity from initiating	XP2 / XP4
Corrosion Control	Significantly reduce ongoing corrosion activity	XP4
Cathodic Protection	Highest level of protection, intended to stop ongoing corrosion	*

*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.

How does it work?

Galvashield anodes work on the principle of sacrificial protection. When two dissimilar metals are placed in an electrolyte (in this case within concrete) the most active metal (zinc) will sacrifice itself to protect the more noble (less active) reinforcing steel. Galvashield XP anodes are embedded in concrete repairs to provide corrosion prevention/ corrosion control to the reinforcing steel immediately adjacent to the repair area. They will prevent secondary corrosion to the steel, commonly referred to as the 'Incipient Anode' or 'Ring Effect'.

Specification clause

The sacrificial anode shall be Galvashield XP2 or XP4; a galvanic system having > 10 years proven performance. The nominal (add zinc mass) of zinc shall be in compliance with ASTM B418 Type II. The sacrificial metal shall be surrounded by a highly alkaline cementitious mortar, which has a pore solution pH of 14 or greater sufficiently high for corrosion of the anode to occur and for passive film formation on the anode to be avoided, as described in patent number WO94/29486PCT.

Galvashield® XP2 / XP4

Application Instructions

Repair Preparation

Break out the concrete from around and behind the steel reinforcement in accordance with good concrete repair practice.

All exposed steel reinforcement should be cleaned to a bright condition paying particular attention to the back of exposed steel bars. Abrasive blasting is recommended for this process.

Prior to installation of the XP units, check the continuity of the steel reinforcement. Any loss of continuity will require additional electrical connections or restoration of continuity by effective means.

Design Tables

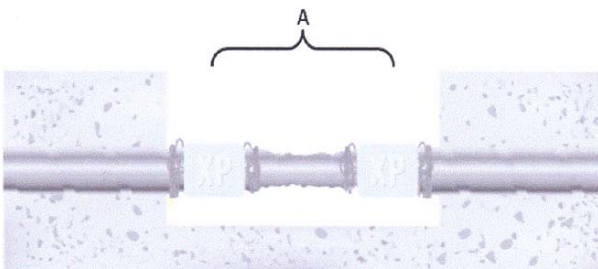
Table 1. Galvashield XP2

Steel surface area per m ² of concrete surface	Anode spacing to achieve Corrosion Prevention (A)
< 0.6	610 mm
0.61 – 0.9	500 mm
0.91 – 1.2	430 mm

Table 2. Galvashield XP4

Steel surface area per m ² of concrete surface	Anode spacing to achieve Corrosion Control (A)
0.55 – 0.94	500 mm
0.95 – 1.17	450 mm
1.18 – 1.41	400 mm
1.42 – 1.64	380 mm
1.65 – 1.88	355 mm
1.89 – 2.11	300 mm

Typical Layout



Product Application

Select a location for the Galvashield XP as close as practical to the edge of the broken out repair zone. Galvashield XP2 / XP4 units should be positioned around/ along the repair boundary.

In addition to standard substrate preparation, the Galvashield XP2 / XP4 anode(s) shall be thoroughly pre-soaked in clean water for a minimum of 10 minutes and a maximum of 20 minutes, prior to the application of the repair mortar.

Attach the Galvashield XP2 / XP4 anodes immediately following preparation and cleaning of the steel reinforcement. The anode spacing shall be in accordance with the repair specification.

Tighten tie wires using Galvashield Fixing Tool so that no free movement is possible, thus ensuring good electrical continuity. To test electrical continuity between tie wires and reinforcement bar a continuity meter should be used. A value between 0 - 1 Ohm shall be achieved. When required, the steel reinforcement should be primed immediately following attachment of the Galvashield XP2 / XP4 with a 135 micron (wft) continuous coating of Nitoprime Zincrich. Over painting onto the surface of the Galvashield XP2 / XP4 unit with bonding agent or reinforcement primer, must be avoided.

The Galvashield XP2 / XP4 should be positioned to ensure all round contact with the reinstatement material is achieved, preventing void formation.

Cover to the Galvashield XP2 / XP4 should equal the depth of cover to the steel reinforcement to which it is attached. In no case shall it be less than 20mm for horizontal repairs or 10mm for vertical and overhead repairs.

Repair Materials

Galvashield XP2 / XP4 should be used in conjunction with Fosroc's extensive range of compatible repair mortars and acrylic bonding/curing agents.

Galvashield XP2 / XP4 are not suitable for use with epoxy and polyester repair mortars or primers, as these are non conductive.

Blanket galvanic protection of sound but contaminated areas of concrete can be established by the use of Galvashield CC sacrificial anodes (refer to Galvashield CC data sheet).

Galvashield® XP2 / XP4

Packaging

Galvashield XP2 / XP4 are sold in packs of 20 units

Table 3: Product dimensions/details

Product Name	Dimensions (mm)	Zinc Mass (gm)
Galvashield® XP2	Length 80	100
	Width 65	
	Depth 30	
Galvashield® XP4	Length 120	160
	Width 65	
	Depth 30	

Storage

Store in dry conditions in the original unopened box. Shelf life 12 months - see package instructions for details.

Galvafruid (for more information please refer to the separate datasheet) must be stored in accordance with the Highly Flammable Liquids and Liquefied Petroleum Gases Regulations 1972.

Precautions

Disposal

All wastewater used to pre-soak Galvashield XP2/ XP4 units must be mixed with a cementitious material before disposal. Once cured dispose in accordance with local regulations.

Health and Safety

Galvashield XP2/ XP4 should be handled using protective gloves, and other personal protective equipment, as per standard procedures for handling cementitious materials.

Galvashield is a registered trademark of Vector Corrosion Technologies Limited.



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