BUILDING TRUST

PRODUCT DATA SHEET

Sika® Galvashield® Fusion® T2

Self-Powered Two-Stage Type 2 Anodes for Corrosion Prevention, Corrosion Control and Cathodic Protection

PRODUCT DESCRIPTION

Sika® Galvashield® Fusion® T2 anodes are a second-generation two-stage anode system used to control corrosion in reinforced concrete structures. Sika® Galvashield® Fusion® T2 are Type 2 anodes for embedment within drilled holes in sound concrete. Sika® Galvashield® Fusion® T2 are based on Fusion® anode technology, combining the performance of an impressed current electrochemical treatment (Stage 1) with the long-term maintenance-free capabilities of an alkali-activated galvanic anode (Stage 2). Sika® Galvashield® Fusion® T2 anodes automatically switch from Stage 1 to Stage 2 to provide long-term, maintenance-free corrosion protection without complex wiring or an external power supply (temporary or permanent). The anode selection and spacing are based upon the specific condition of the structure. Final designs utilise standard cathodic protection principles in accordance with ISO BS EN 12696 and NACE RP0290, or can be based on achieving cathodic protection or passivation in Stage 1 and cathodic prevention in Stage 2.

USES

Sika® Galvashield® Fusion® T2 anodes may only be used by experienced professionals.
Applications:

- Multi-storey car parks (MSCPs).
- Balconies and walkways.
- Bridge decks, columns and beams.
- Marine piers, jetties and wharfs.
- Abutments, pier caps and girders.
- Piles and pile caps in a marine environment.
- Targeted protection of areas with high corrosion risk.
- Swimming pools and concrete tanks.
- Protection of entire structure or structural elements.
- Highly corrosive environments (such as breweries, pulp and paper factories, and other industrial facilities).

CHARACTERISTICS / ADVANTAGES

- **Proven Technology** - ICCP electrochemical treatment and alkali-activated galvanic anode technologies fused together into a single unit.
- **Simple Installation** - Sika® Galvashield® Fusion® T2 anodes are single unit two-stage systems with no external power requirements.
- **Low Maintenance** - Sika® Galvashield® Fusion® T2 anodes operate automatically once installed, reducing access requirements and therefore time and cost.
- **Long Lasting** - Can be designed to provide corrosion protection for 30 years or more without the need for maintenance *. Phase 1 can be designed to be repeated at any time in the future, if desired.
- **Measurable Performance** - While not critical for the long-term operation of the system, the site performance can be measured and validated, if required.
- **Modular** - Ideal for targeted protection to identified areas of corrosion risk (i.e. 'hotspots').

** 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.*

PRODUCT INFORMATION

Packaging

20 units per box

Shelf Life

12 months

Storage Conditions

Store in dry conditions in the original unopened box. Avoid extremes of temperatures and humidity.

Dimensions

Unit	Description	Unit Size (diameter x length)	Minimum Hole Size (diameter x depth)
Sika® Galvashield® Fusion® T2 Standard	Large capacity two-stage anode	46 x 105 mm	50 x 135 mm
Sika® Galvashield® Fusion® T2 Slim	Small diameter two-stage anode	29 x 135 mm	35 x 165mm

Design Considerations

Level of Protection	Description	Sika® Galvashield® Fusion® T2 Capability
Corrosion Prevention	Mitigates initiation of new corrosion activity	Yes
Corrosion Control	Reduces ongoing corrosion activity	Yes
Cathodic Protection	Reduce or eliminate ongoing corrosion activity	Yes

Embedded anodes shall be Sika® Galvashield® Fusion® T2 anodes. The two-phase anode shall be pre-manufactured, and shall include a self-powered ICCP anode and an alkali-activated galvanic anode in a single unit. The galvanic anode shall have a zinc core produced with zinc in compliance with ASTM B418 Type II and be encased in an activated cementitious mortar with pH ≥14. The galvanic units shall contain no intentionally added chloride, bromide, sulphate or other constituents that are corrosive to reinforcing steel as per ACI document 222R.

System Structure

Sika® Galvashield® Fusion® T2 anodes are part of a Concrete Repair System in accordance with the guidelines of BS EN 1504-9.
Sika® MonoTop®-1010: Bonding primer and reinforcement coating (normal use).
SikaTop® Armatec®-110 EpoCem®: Bonding primer and reinforcement coating (demanding requirements).
Sika® MonoTop®-4012: Class R4 Hand and wet spray applied repair mortar.
Sika® MonoTop®-615: Class R3 Hand and wet spray applied high build repair mortar.
Sika® MonoTop®-614 F: Class R4 Pourable repair mortar.
Sika® MonoTop®-630 Rapid: Class R4 Hand applied fast setting repair mortar.
SikaCem®-133 Gunite Range: Class R4 Dry spray applied repair mortars.
Sika® MonoTop®-3020: Smoothing / levelling / fairing coat.
Sika® FerroGard®-903+: Liquid active corrosion inhibitor.
Sika® Galvashield® Embedment Mortar: Mortar for embedding Sika® Galvashield® Fusion® T2 anodes.
N.B. For optimum performance, use an ionically conductive, cement-based repair mortar or concrete. In accordance with ISO 12696, electrical resistivity and mechanical properties of the repair material shall be compatible with the original concrete. Repair materials typically should have an electrical resistivity of half to two times the resistivity of the parent concrete when measured under the same exposure conditions. If repair materials with a saturated bulk resistivity of 50,000 Ω·cm or greater are to be used, pack Sika® Galvashield® Embedding Mortar (or another repair mortar with a resistivity of 15,000 Ω·cm or less) between the anode and the substrate

VALUE BASE

All technical data stated in this Product Data Sheet are based on laboratory tests. Actual measured data may vary due to circumstances beyond our control.

USES

Sika® Galvashield® Fusion® T2 anodes are not intended to address or repair structural damage. Where structural damage exists, consult a suitably qualified Structural Engineer.
Any discontinuous steel should be either electrically connected or isolated.
Complete concrete repairs prior to the installation of Sika® Galvashield® Fusion® T2 anodes.

ECOLOGY, HEALTH AND SAFETY

User must read the most recent corresponding Safety Data Sheets (SDS) before using any products. The SDS provides information and advice on the safe handling, storage and disposal of chemical products and contains physical, ecological, toxicological and other safety-related data.

APPLICATION INSTRUCTIONS

APPLICATION

Sika® Galvashield® Fusion® T2 anodes shall be installed in a single line or on a grid pattern as specified in the design document. Using a rebar locator, locate existing steel and mark areas to drill rebar connection holes and anode installation holes to avoid cutting steel. Rebar connection hole dimensions will be as per desired connection method. When possible, anodes should be installed in the center of a reinforcing grid or a minimum of 100 mm away from steel. Drill all anode connection holes to the appropriate depth. Anodes may be individually connected to the steel reinforcement, or may be connected in a circuit as per the design. In either case, be sure to confirm electrical continuity between all steel connections with a multimeter. A resistance of 1Ω or less is acceptable.
Individual Connection - For individual connections, drill a single 12 mm rebar connection hole per anode unit location. Saw cut a groove approximately 6 mm wide by 12 mm deep into the concrete to interconnect the rebar connection hole and anode connection hole. Reinforcing steel connections should be made using the Sika® Galvashield® Anode Connection Kit. After cleaning out the hole, place the weighted end of the steel connector into the drilled hole until the steel coil contacts the reinforcing steel. Feed the steel connector wire through a Setting Tool and set into place by striking with a hammer.
Series Connection - For installing in series ('daisy chain'), a single circuit shall contain no more than twenty Sika® Galvashield® Fusion® T2 anodes. Reinforcing steel connections should be made using the Sika® Galvashield® Anode Connection Kit. When using the Sika® Galvashield® Anode Connection Kit, drill a minimum of two 12 mm rebar connection holes per string of anodes and saw cut a groove 6 mm by 12 mm, linking the rebar connection holes to the anode connection holes. Install the rebar connectors as detailed above. The wire and connectors supplied in the Sika® Galvashield® Anode Connection Kit will be used to link rebar connections to the anode units. If using Sika® Galvashield® Rivet Connectors, chip 50 mm holes to expose rebar in two locations. Electrical connection to the steel shall be established by drilling a 5 to 7 mm deep hole into the steel using the 3.5 mm drill bit provided. 3.2 mm stainless steel pop rivets are used to connect the connection wire to the steel. The connection shall be insulated by a neutral cure sealant or epoxy.
Anode Installation - Pre-wet the holes and the anodes to a saturated surface dry (SSD) condition, then install with Sika® Galvashield® Embedment Mortar. Mix one 20 kg bag of mortar with 3.2 to 3.9 litres of potable water. Add the powder to the water and mix with a drum or paddle mixer until a smooth consistency is achieved. Do not mix partial bags. Place the mixed Sika® Galvashield® Embedment Mortar into the bottom 2⁄3 of each hole and slowly press the anode into the mortar, allowing the mortar to fill the annular space, ensuring there are no air voids between the anode and the parent concrete. The minimum cover depth over the anodes shall be 20 mm. Connect the anodes to the interconnecting header wire with the supplied connectors (wire and connectors are available as the Sika® Galvashield® Anode Connection Kit). After all anodes along the string are connected to the interconnecting cable, verify continuity between anodes and rebar connections with a multimeter. Testing is carried out using a portable copper/copper sulfate reference electrode, once the anodes have been connected to the steel. Connect the DC Volt port of the multimeter to the steel. Connect the portable reference cell to the COM port. With the reference cell on top of each anode within the string, record the individual readings at each anode. A reading more negative than 2.5V (when using a passivation / prevention design) or 1.0V (when using cathodic protection design) indicates a positive connection. Place wires into grooves and top off anode holes and saw cuts flush to the concrete surface with Sika® Galvashield® Embedment Mortar. Ensure there is sufficient concrete cover over all wires. Sika® Galvashield® Embedment Mortar should be wet cured, or cured with a curing compound, and protected from traffic for at least 24 hours.

NOTE: Minimum anode hole dimension is 30 mm deeper than the anode length and 6 mm wider than the anode diameter.

LOCAL RESTRICTIONS

Please note that as a result of specific local regulations the performance of this product may vary from country to country. Please consult the local Product Data Sheet for the exact description of the application fields.

LEGAL NOTES

The information, and, in particular, the recommendations relating to the application and end-use of Sika products, are given in good faith based on Sika's current knowledge and experience of the products when properly stored, handled and applied under normal conditions in accordance with Sika's recommendations. In practice, the differences in materials, substrates and actual site conditions are such that no warranty in respect of merchantability or of fitness for a particular purpose, nor any liability arising out of any legal relationship whatsoever, can be inferred either from this information, or from any written recommendations, or from any other advice offered. The user of the product must test the product's suitability for the intended application and purpose. Sika reserves the right to change the properties of its products. The proprietary rights of third parties must be observed. All orders are accepted subject to our current terms of sale and delivery. Users must always refer to the most recent issue of the local Product Data Sheet for the product concerned, copies of which will be supplied on request.
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