TECHNICAL DATASHEET

DuoGuard ™400 Ultra Slim

A hybrid anode system designed to be used in the concrete cover zone in areas of highly congested steel

Uses

DuoGuard™ 400 Ultra Slim is a type of DuoGuard Hybrid Anode system used to provide corrosion protection. It is designed to be used in the cover zone in areas of highly congested steel where there is insufficient space to drill the 30mm holes required to install the standard DuoGuard anode.

Advantages

- Simple, single unit with straight forward installation
- No long- term power supply needed
- A variety of sizes to suit the structure
- Large charge capacity >350 kC
- High impressed current density >1000 mA/m2*
- Long life, up to 60 years *
- Rapidly halts steel corrosion to eliminate further concrete spalling
- Short on-site treatment minimises structure downtime during application
- Minimal long-term costs
- Performance can be monitored
- Accidental electrical shorts easily broken
- Cost-effective corrosion control solution

Description

The DuoGuard™ 400 Ultra Slim hybrid anode is a dual technology anode utilising a sacrificial metal in both an impressed current and galvanic anode role. Initially an impressed current is driven from the DuoGuard™ 400 Ultra Slim anode to the steel using a temporary power supply. In the process corroding sites on the steel are moved to the surface of the installed anode. This occurs because the treatment generates inhibitive hydroxide ions at the steel and aggressive chloride ions are drawn from the concrete to the installed anode. At the end of the brief impressed current treatment the DuoGuard™ 400 Ultra Slim is connected to the steel to act as a sacrificial anode in a long- term preventative role.

Application

Design of the DuoGuard™ 400 Ultra Slim system shall be undertaken by a competent designer. Application shall follow the guidelines of EN12696:2016 and DD CEN/TS 14038-2:2011 and shall be in accordance with the Installation Guidelines, summarised as follows:

The DuoGuard™ 400 Ultra Slim anodes are typically applied at a density of 4-9 units/m² concrete surface, at a spacing of 350-500 mm between anodes. The anode units are typically installed into pre-drilled holes of 25mm diameter and 270-300mm depth. DuoCrete SD embedding mortar is installed into the hole and the anode inserted ensuring no air bubbles are trapped.

The individual DuoGuard™ 400 Ultra Slim units are connected electrically to a feeder wire which runs to the temporary power supply for the impressed current phase of the treatment (typically 1 week) during which time the anodes distribute ~50-500 kc/sqm steel surface.

After the impressed current phase the feeder wire is removed from the temporary power supply and connected to the reinforcing steel. The DuoGuard™ 400 Ultra Slim is now operating in galvanic mode, maintaining the steel in a passive state.

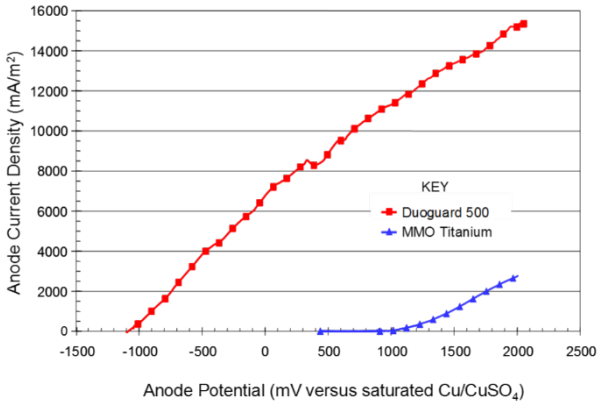
Properties

Product	Diameter	Length	Zinc Weight
DuoGuard 400 Ultra Slim	20mm	250mm	150g

Technical Data

The DuoGuard anode offers the significant advantage of running at relatively low driving voltages in impressed current mode versus the commonly used MMO anode. A polarisation curve for a DuoGuard™ 500 anode is shown below and demonstrates the high current densities possible at low drive voltages.

*Service life and current density will depend on local site conditions including chloride contamination, concrete properties, humidity and temperature. A unit of 110mm x 18mm can offer a lifetime of up to 50 years.



Limitations

In order that suitable current flow and lifetime be achieved from the DuoGuard™ 400 Ultra Slim anodes, certain practical considerations should be taken into account. The patch repair material cover for the DuoGuard unit must be a minimum depth of 20mm. When installed in a patch repair, the resistivity of the repair material should be in the range 50-200% of the parent concrete.

Any discontinuous steel should be either electrically bonded to, or electrically isolated from the system negative. Any cracks or delaminations in the concrete which affect ionic current flow will affect performance of the DuoGuard™ 400 Ultra Slim unit and should be pre-treated. During installation, electrical shorts between the DuoGuard™ 400 Ultra Slim anodes and other metal components must be avoided.

The time to achieve passivity will be dependent on-site conditions. Depolarisation of treated steel will be slower in moist conditions.

Storage

Store dry.

Do not allow contact with oxidizing materials.

Ancillary Materials

DuoCrete SD Mortar

MN15 Manganese dioxide reference electrode

Monitoring equipment

Precautions- Health and Safety

Protective clothing must be worn.

Wear gloves and eye protection at all times.

Specification Clause

The discrete anode shall be DuoGuard, a sacrificial alloy anode with an integral titanium electrical connection which can operate in both impressed current distribution and sacrificial anode modes

Supplied and Distributed by

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