TECHNICAL DATASHEET

DuoGuard Ultra™

A type of DuoGuard hybrid anode used in areas of congested steel and for new construction applications.

Uses

DuoGuard Ultra is a type of DuoGuard hybrid anode encapsulated in an activating mortar matrix. It is designed for use in areas of congested steel and for new construction applications.

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 > 175 to 1000 kC
- Service life in excess of 25 years can be achieved*
- 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
- Prevents electrical shorts on installation
- Cost effective corrosion control solution

* Service life will depend on local site conditions including chloride contamination, concrete properties, humidity and temperature.

Description

DuoGuard Ultra™ is a dual technology hybrid anode™ based on the use of a sacrificial anode. An impressed current is driven from the DuoGuard Ultra 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 anode is connected to the steel to act as a sacrificial anode in a long term preventative role.

Application

Application shall follow the guidelines of BS EN ISO 12696:2016 and DD CEN/TS 14038-2:2011 and shall be in accordance with the 'Installation Guidelines' summarised as follows:

The anode units are typically applied at a density of 4-9 units/m^2 concrete surface and at a spacing of 350mm (13¾") to 500mmm (20"), depending on local conditions and steel density. DuoGuard Ultra is typically installed into the cover zone of the repair. The units are pre-soaked in water prior to concrete reinstatement. The unit is attached to the rebar using 2 plastic cable ties to a feeder wire which runs to the temporary power supply for the impressed current phase of the treatment during which time the DuoGuard Ultra anodes distribute ~50-500 kC/sqm steel surface. After 1-2 weeks the feeder wire is removed from the temporary supply and connected to the reinforcing steel. The DuoGuard Ultra units are now operating in galvanic mode, maintaining the steel in a passive state.

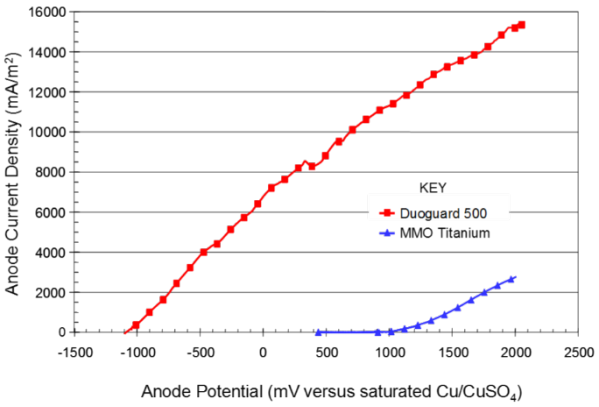
Properties

Product	Diameter	Length*	Zinc Weight
DuoGuard 175 Ultra	32mm (1 ¼")	55mm (2 ¼")	65g
DuoGuard 350 Ultra	32mm (1 ¼")	95mm (3 ¾")	120g
DuoGuard 500 Ultra	32mm (1 ¼")	125mm (5")	180g
DuoGuard 750 Ultra	32mm (1 ¼")	180mm (7 ⅛")	285g
DuoGuard 1000 Ultra	32mm (1 ¼")	235mm (9 ¼")	370g

* Nominal dimensions

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 typical polarisation curve for a DuoGuard™ 500 anode is shown below and demonstrates the high current densities possible at low drive voltages. The lifetime of the unit can be estimated from knowledge of the anode and total current requirement.



Limitations

In order that suitable current flow and lifetime be achieved from the DuoGuard Ultra anode, certain practical considerations should be taken into account. The patch repair material cover for the DuoGuard unit must be a minimum depth of 20mm (⅞"). 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 delamination's in the concrete which affect ionic current flow will affect performance of the DuoGuard Ultra unit and should be pre-treated. During installation, electrical shorts between the DuoGuard anode 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.

Packaging

175/350 Ultra	50 Units per box
500 Ultra	40 Units per box
750 Ultra	30 Units per box
1000 Ultra	25 Units per box

Storage

Store dry

Do not allow contact with oxidizing materials

Ancillary Materials

DuoCrete SD Mortar

MN15 Manganese dioxide reference electrodes

Monitoring equipment

Precautions - Health and Safety

Health and safety protective clothing, gloves and eye protection must be worn at all times.

Specification Clause

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

Supplied and Distributed by

Duoguard Australia Pty Ltd
Ph -1300782501
www.Duoguard.com.au

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For technical and sales support please contact us at:
Concrete Preservation Technologies
1 Palmer Business Court, Manor House Road, Nottingham, UK, NG10 1LZ
(T) +44 (0) 115 9724 238 (E) general@cp-tech.co.uk
www.cp-tech.co.uk