

EMACO CP 60 ANODE®

High-Performance Anode for Reinforced Concrete Cathodic Protection (CP)

Description of Product

EMACO CP 60 ANODE is a unique two component highly durable anode designed specifically for impressed current cathodic protection of steel reinforced concrete structures which have active corrosion.

The system may also be used as a preventative measure against the onset of corrosion in structures which may be at risk.

The material comprises a powder component and a liquid polymer which is applied at 8mm thickness using the wet spray technique.

The electro catalytic coating on the highly conductive fibres has a very low consumption rate and anode interfacial reactions are uniformly distributed throughout the body of the material resulting in a long and maintenance free life.

Fields of Application

- Highway structure
- Car parks
- Building
- Bridges
- Marine structures

Features and Benefits

- Long life and maintenance-free
- Efficient electrical current distribution and high conductivity
- Excellent adhesion
- Impact and abrasion resistant
- Excellent concrete compatibility
- Cement-based system
- Vapour permeable
- Thin layer, low weight application
- No mesh anode required
- Wet-spray applied
- Low rebound
- Single application

Technical Data/Typical Properties

Anode characteristics	
Maximum current density (concrete structure surface area), mA/m ²	20
Bulk resistivity, ohm.cm	<10
Typical physical properties^(a)	
Density, kg/m ³	2200
Compressive strength (28 days) (EN 196), N/mm ²	92
Tensile strength (28 days), N/mm ²	7
Flexural strength (28 days), N/mm ²	15
Bond strength (failure in concrete) (SS13 72 31), N/mm ²	3.8
Freeze/thaw resistance (56 days) (SS13 72 44), kg/m ²	0.02
Impact resistance (NF P 18854) 28 days ambient cure	No cracking / debonding
2 months sea water ponding	
2 months motor oil ponding	
56 days freeze/thaw cycles (NaCl)	

^(a) Typical values at 20°C

Tests and approvals

EMACO CP 60 ANODE has been tested by The Swedish National Testing and Research Institute: Freeze/thaw resistance: SP, Sveriges Provnings-och Forkningsinstitut, No.95B4,1845 Adhesion and compressive strength: SP Sveriges Provnings-och Forkningsinstitut, No. 94B4.5018A



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Application Procedure

Preparation

Preparation of the concrete substrate is vital to achieve optimum performance and long service life from the cathodic protection installation. Remove all surface coatings, defective renders, foreign matter, formwork treatments, laitance, algae and other contaminants that may adversely affect the bond. Use abrasive blasting or high pressure water jetting.

Do not use vibrating or high impact methods; such methods increase the risk of inducing micro cracks that may affect the adhesion and long-term durability of the anode system.

The prepared substrate should have a pull-off strength of at least 1.5N/mm².

Spalled or delaminated areas and cracks should be repaired with approved EMACO CP concrete repair products. Hairline cracks may be left untreated. Under no circumstances should any cracks be injected with materials, which will insulate areas from the CP system. Areas of low cover and exposed steel must be treated or the cover built up to that required.

Primary Anode^(a)

A primary anode is an essential requirement for a EMACO CP 60 ANODE system. The required number and configuration for correct current distribution will be project specific and is, therefore, a CP design decision. As a guide for a plane surface, primary anodes should be placed at 2m centres (maximum) with a 1m clearance from the edges of the anode zone. The primary anode should be fixed to the prepared substrate by plastic anchors.

The configuration should allow the connection to the rectifier to be made outside the anodic zone and in duplicate as a minimum. Suitable primary anode materials include surface activated titanium mesh ribbon.

^(a) Contact your BASF Construction Chemical (UK) Ltd Office for advice.

Mixing

It is essential that the temperature of both components of EMACO CP 60 ANODE is at least 15°C before mixing. Use approximately 4.7 litres (4.1 litres minimum - 5.3 litres maximum) of EMACO CP 60 ANODE Part 2 for each 25kg sack of EMACO CP 60 ANODE Part 1.

Using a power mixer (no tumbling motion), add the powder to the liquid. Mix until the powder is wet throughout and maximum dispersion of all ingredients has been obtained. Allow the mix to stand for 5 to 10 minutes.

Re-mix adding a little additional liquid when required, without exceeding the maximum 5.3 litres. *Do not over mix.*

Application

The temperature should be above 5°C during application and for at least 24 hours thereafter. Apply EMACO CP 60 ANODE when no rainfall is expected or take the necessary protective measures using, for example, plastic sheets.

Under extremely hot or windy conditions it is advised that hot substrates are cooled with potable drinking water and that the application should take place between sunset and sunrise. Use sunlight-reflecting pump lines; provide wind protection and clean equipment frequently.

EMACO CP 60 ANODE should be applied to surfaces that have been well dampened but which are free from standing water.

EMACO CP 60 ANODE has been designed for spray application only, using wet-spray concrete techniques. Suitable spray equipment, essential for successful application, includes hand-held hopper guns and worm-driven equipment. Contact your local BASF Construction Chemicals (UK) Ltd office for advice.

Application is carried out in two stages. Spray the first coat to a thickness of 1 to 2mm. Immediately after spraying, and while still wet, broom the material into the concrete surface. Spray the second coat immediately onto the first (still wet) coat to the recommended thickness of 8mm, using pre-placed battens to achieve the 8mm thickness. Apply to a limited area only to prevent premature drying of the first coat. If, for whatever reason, the first coat has set, apply a new broom coat before building up to the 8mm thickness.

Curing

EMACO CP 60 ANODE is self-curing. Under poor conditions, for example where rapid drying may occur (hot and/or windy conditions), protect by covering the EMACO CP 60 ANODE with plastic sheets or by broadcasting dry silica sand onto horizontal surfaces after the surface film has formed.

When mixed the product has a pot life of approximately 30 minutes at 21°C.

After the final spray application, the following curing times should be used as a guide before EMACO CP 60 ANODE is subjected to foot traffic:

Temperature, °C	Time (minimum), hours
35	25
20	72
5	120

Coverage

Coverage is dependent upon various factors, including the method of working and substrate condition.

The recommended applied thickness of EMACO CP 60 ANODE is 8mm.



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When one 25kg sack of Part 1 is mixed with 5 litres of Part 2 liquid polymer, approximately 13.8 litres of EMACO CP 60 ANODE will be produced. Approximately 73 sacks of Part 1 and 18 pails of Part 2 are required to produce approximately 1m³ of mixed material.

Packaging

EMACO CP 60 ANODE is supplied pre-packed; Part 1 is in 25kg plastic-lined paper sacks and Part 2 in 20 litre pails.

Storage

EMACO CP 60 ANODE should be stored under cover and clear of the ground. Storage conditions should be dry. Do not stack more than 6 sacks or 2 pails high. Protect from moisture and frost; preferably store at above 15°C but in any case not below 5°C.

Shelf Life

If stored in accordance with manufacturer's instructions in unopened containers part 1 is 6 months and part 2 is 12 months.

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Health and Safety

*For full information on Health and Safety matters regarding this product the relevant Health and Safety Data Sheet should be consulted.

The following general comments apply to all products.

As with all chemical products, care should be taken during use and storage to avoid contact with eyes, mouth, skin and foodstuffs, (which may also be tainted with vapour until the product is fully cured and dried). Treat splashes to eyes and skin immediately. If accidentally ingested, seek medical attention. Keep away from children and animals. Reseal containers after use.

Solvent Based Products

Use in well-ventilated areas; avoid inhaling. Suitable respiratory equipment may be needed, eg when spraying. Can cause skin, eye irritation. Wear protective eye shields and gloves during use. Do not smoke or allow sparks or naked lights when stored or in use.

Powder Products

Should be handled to minimise dust formation; use light mask if excessive dust unavoidable. Cement powders when wet or moistened can cause burns to skin and eyes, which should be protected during use.



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Resin Products

Can cause irritation, dermatitis or allergic reaction. Use protective equipment particularly for skin and eyes. Use only in well ventilated areas.

Spillage

Chemical products can cause damage; clean spillage immediately.

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