

THORO[®] CP ANODE OVERLAY

Mortar Overlay for Mesh Anodes In Reinforced Concrete Cathodic Protection (CP)

Description of Product

THORO[®] CP ANODE OVERLAY is a highly durable, wet spray applied encapsulating overlay for use with mesh anodes in impressed current cathodic protection of steel reinforced concrete structures.

There are two systems available: **THORO[®] OVERLAY_V** for vertical, inclined and overhead situations and **THORO[®] OVERLAY_H** for horizontal applications.

Fields of Application

Suitable applications include the control of active corrosion or the prevention of the onset of corrosion in:

- Highway structures
- Bridges
- Car parks
- Buildings
- Marine structures

Features and Benefits

- Specially developed for use with mesh anodes and concrete
- High adhesion
- Reduced overlay thickness
- Wet-spray applied
- Pre-packed

Technical Data/Typical Properties^(a)

THORO[®] CP ANODE OVERLAY V	
Density, kg/m ³	2100
Compressive strength (28 day), N/mm ²	36
Flexural strength (28 day), N/mm ²	7
Bond strength (28 day), N/mm ²	>2
THORO[®] CP ANODE OVERLAY H	
Density, kg/m ³	2200
Compressive strength (28 day), N/mm ²	43
Flexural strength (28 day), N/mm ²	9
Bond strength (28 day), N/mm ²	3
Freeze/thaw resistance (SS13 72 44), kg/m ²	Scaling 0.04

(a) Typical values at 20°C

Tests and approvals

THORO[®] CP ANODE OVERLAY V has been tested by CRIC Belgium for compressive strength, Report No. 77 269.

THORO[®] CP ANODE OVERLAY H has been tested by Statens Provningsanstalt Sweden for freeze/thaw resistance, Report No. 89B4,3128

Application Procedure

Substrate quality

In order to cathodically protect steel-reinforced concrete, electrical continuity of the steel is required. For existing structures a condition survey should be undertaken to establish the suitability of the structure for Cathodic Protection. Reference should be made to the draft CEN Standard TC262/SC2/WG2.

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 that 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 THORO[®] 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 Cathodic Protection system. Areas of low cover and exposed steel must be treated or the cover built up to that required.

Mesh Anodes

The type and configuration of mesh anodes are a Cathodic Protection design decision. Suitable material will normally involve titanium mesh with a metal oxide coating.

Contact Degussa Construction Chemicals (UK) for advice.

Mixing

Both THORO[®] CP ANODE OVERLAY V and THORO[®] CP ANODE OVERLAY H comprise a powder component (Part 1) and a liquid component (Part 2). Ensure that the temperature of both components is at least 5°C before mixing.

THORO[®] CP ANODE OVERLAY V

Approximately 4.2 litres (3.8 litres minimum – 4.5 litres maximum) of THORO[®] CP ANODE OVERLAY V part 2 are required for each 25kg of THORO[®] CP ANODE OVERLAY V Part 1.

THORO[®] CP ANODE OVERLAY H

Approximately 3.8 litres (3.5 litres minimum – 4.2 litres maximum) of THORO[®] CP ANODE OVERLAY H Part 2

are required for each 25kg of THORO[®] CP ANODE OVERLAY H Part 1.

Using a power mixer, 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 'fatten' for 5 to 10 minutes.

Re-mix adding a little additional liquid when required, without exceeding the maximum of 4.5litres for THORO[®] CP ANODE OVERLAY V or 4.2 litres for THORO[®] CP ANODE OVERLAY H. *Do not overmix.*

Application

The temperature should be above 5°C during application and for at least 24 hours thereafter. Apply THORO[®] CP ANODE OVERLAY 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.

THORO[®] CP ANODE OVERLAY should be applied to surfaces that have been well dampened.

THORO[®] CP ANODE OVERLAY 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.

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, in accordance with the mesh manufacturer's instructions, but in any case not less than 10mm cover to mesh and not exceeding 15mm cover to mesh for THORO[®] CP ANODE OVERLAY H and not exceeding 17mm for THORO[®] CP ANODE OVERLAY V.

The brooming of the first layer is essential for all types of application.

Apply to a limited area only to prevent premature drying of the first coat. If the first coat has set, apply a new broom coat before building up to the required thickness.

Overhead applications of THORO[®] CP ANODE OVERLAY V

After the first coat has been broomed into the substrate, apply in successive layers of 6 to 8mm until the required

thickness is achieved, allow each layer to stiffen but not set before applying the next layer.

Curing

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

Pot Life

THORO® CP ANODE OVERLAY V – 60 minutes at 21⁰C
THORO® CP ANODE OVERLAY H – 30 minutes at 21⁰C

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

Temperature °C	Time (minimum), hours
35	24
20	48
5	72

Overcoating

THORO® CP ANODE OVERLAY can be overcoated with approved THORO® CP products such as THORO® LASTIC, in order to enhance performance in aggressive environments or for aesthetic purposes.

Clean up

Cleaning of equipment and tools should be carried out as soon as practicable well away from the application area. Surplus materials should be removed and disposed of in accordance with requirements of the Local Authority.

Operation maintenance of the CP installation

To achieve cathodic protection of the reinforcement and optimise the service life of the CP system, especially the anode, it is essential that suitable design, commissioning, monitoring, control and maintenance procedures are followed. Reference should be made to the draft CEN Standard TC262/SC2/WG2.

Coverage

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

THORO® CP OVERLAY V

When one 25kg sack of part 1 is mixed with 4.17 litres of Part 2 liquid polymer, approximately 13.9 litres of THORO® CP ANODE OVERLAY V will be produced. Approximately 72 sacks of Part 1 and 15 pails of Part 2 are required to produce approximately 1m³ of mixed material.

THORO® CP OVERLAY H

When one 25kg sack of Part 1 is mixed with 3.80 litres of Part 2 liquid polymer, approximately 13.1litres of THORO® CP ANODE OVERLAY H will be produced. Approximately 76 sacks of part 1 and 15 pails of Part 2 are required to produce approximately 1m³ of mixed material.

Packaging

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

Storage

THORO® CP ANODE OVERLAY 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 temperatures below 5°C.

Shelf Life

Under normal conditions, in unopened packaging, the shelf life is 6 months for Part 1 and 12 months for the Part 2.

