



Duromac CP

Duromac CP is a passive corrosion protection system for reinforcing steel embedded in concrete. The system is composed of **Durozinc CP** anodes and the conductive paste **Duroperm CP**.

The **Duromac CP** cathodic protection system has been specifically designed for retrofit application to extend the service life of existing reinforced concrete structures. The zinc anodes are easily installed into pre-drilled holes without the need for extensive concrete removal. The special shape of the anodes allows a high initial current as is required for retrofit application.

Duromac CP installations may be temporarily run as hybrid systems under specialist cathodic protection supervision..

Installation:

Durozinc CP anodes are usually installed into drilled holes and connected to the reinforcement cage with cables. For maximum performance and efficiency an appropriate distance between anode and reinforcing steel should be maintained. Reinforcement should be located prior to drilling installation holes. Bore hole sizes are specified in the table below.

Cables are installed in grooves within the concrete cover. Cable connections are preferably made by soldering. Connections must be properly insulated, usually with epoxy resin.

After drilling the holes the dust has to be removed which is best done with oils-free compressed air. If a performance surveillance of the CP system is to be applied or even a hybrid mode operation, short circuits with the reinforcement must be avoided. With the help of the **Duromac CP** resistance measurement tool (item No. D 003 0015) this can be verified easily, and possible short circuits or near-short circuits can be located along the drilling hole.

An appropriate quantity of the conductive paste **Duroperm CP** (see table below) is injected in the drill hole prior to inserting the anode. The paste should be injected to the bottom of the hole to avoid air pockets. The sacrificial anode is then slowly inserted in the hole displacing the conductive paste.

Contamination of borehole walls close to the surface and of the cable grooves with conductive

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paste should be avoided, since this would impair bonding properties.

Before closing holes and grooves permanently proper installation of the system should be verified by carrying out resistivity measurement (according to e.g. ISO12696).

For mechanical protection of the system holes and grooves should be closed with a high quality shrinkage compensated repair material with good bonding properties.

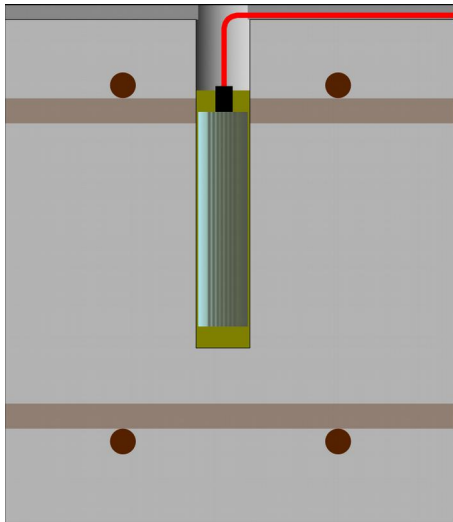


Illustration 1: Installation of Duromac CP.

For installation use the **Duromac CP** setting tool (item No. D 003 0011).

In case of over head installation **Duromac CP** fixing wedges (item No. D 003 0012) will keep the anodes in place until the installation hole is sealed.

For further information about design and installation of cathodic protection systems refer to ISO 12696.

Design:

Interactions within a cathodic protection system are very complex and depend on multiple parameters. Moisture, alkalinity, substrate resistivity, carbonation status, temperature and chloride content are only examples of factors having a significant impact on the efficiency of the system.

For a correct design all these factors must be investigated and their influence must be understood. Faulty system design may result in insufficient protection of essential parts of the structure and may lead to severe damage.

We therefore strongly recommend installing cathodic protection systems only in accordance with specific design by an experienced specialist.

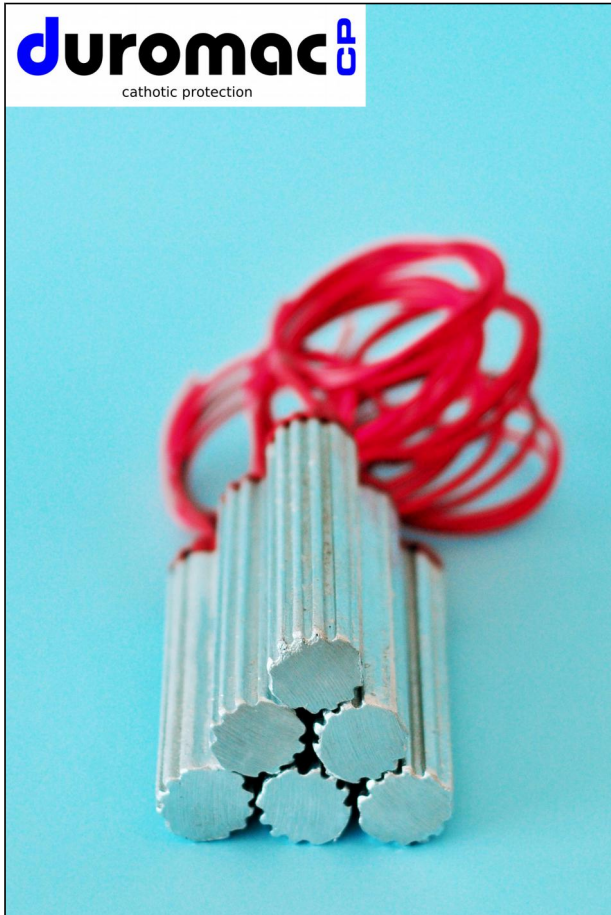
Technical data, installation:

Anode type	CP 250	CP 400	CP 800
length	100 mm	150 mm	300 mm
dia.	23 mm	23 mm	23 mm
mass	260 g	390 g	790 g
bore hole dia.	25 mm	25 mm	25 mm
bore hole depth recomm. min.	160 mm	210 mm	360 mm
inst. paste	25 ml	32 ml	50 ml

Customized anode sizes available on request.

Packaging:

CP 250 Item No. D 003 0022	24 x anode 260g + conductive compound 600ml
CP 400 Item No. D 003 0023	18 x anode 390g + conductive compound 600ml
CP 800 Item No. D 003 0024	12 x anode 790g + conductive compound 600ml
CP 250 small Item No. D 003 0025	12 x anode 260g + conductive compound 290ml cartridge



Durozinc CP

Durozinc CP galvanic anodes are made of zinc alloy specifically for sacrificial anodes and are designed for application in existing structures.

Durozinc CP galvanic anodes are to be used in conjunction with **Duroperm CP** conductive paste.

Technical data:

Durozinc CP
(Sacrificial zinc anode)

Zn-Al-Cd-alloy conforming to US Mil Spec 18001 K.

Alloy composition by weight (percentage):

Cu	≤0.005%
Al	0.1 - 0.5%
Fe	≤0.005%
Cd	0.025 - 0.07%
Pb	≤0.006%
Others (total)	≤0.1%
Zn	Remainder

Anode performance data:

Capacity 780 Ah/kg
Utilization 95%
Open Circuit Potential -1.05 volt (Ag/AgCl)



Duoperm CP

Galvanic zinc anodes in concrete have a tendency to form an oxide layer at the surface which acts as an electric insulation and renders the anode inactive soon after installation.

Duoperm CP is a gelatinous compound which is designed specifically for encapsulating galvanic zinc anodes in holes drilled into reinforced concrete structures in dry and semi-dry environments.

Duoperm CP prevents the zinc anode surface from becoming passive. In a passive state corrosion protection of the reinforcement will not be effective. The ingredients in the paste maintain a low electrolyte resistance on the concrete interface and keep the zinc surface active.

The general performance of the galvanic CP system will also be enhanced by enabling an even current distribution across the anode even in rather dry concrete.

Duoperm CP is best applied with sealant guns. Nozzles should be appropriate to inject the material to the bottom of the installation hole.

Duoperm CP is supplied in 290ml cartridges and in 600 ml flex packs along with the **Duromac CP** anode packages..

Technical data:

Duoperm CP

(Conductive compound for sacrificial zinc anodes)

Specific weight:	1.6g/cm ³
Packaging:	290ml cartridge 600ml flex pack
Storage conditions:	≤30°C ≤65% rel. h.
Shelf life:	max. 18 month in original unopened package

Does not contain any hazardous substances (refer to material safety data sheet).

Duromac CP order numbers

Item/ order no.	Description
D 003 0011 Duromac CP	setting tool 1 pc.
D 003 0012 Duromac CP	fixing w edges 100 pcs.
D 003 0015 Duromac CP	short circuit tester 1 pc.
D 003 0022 Duromac CP	CP 250 24 pack incl.DuropermCP 600ml
D 003 0023 Duromac CP	CP 400 18 pack incl.DuropermCP 600ml
D 003 0024 Duromac CP	CP 800 12 pack incl.DuropermCP 600ml
D 003 0025 Duromac CP	CP 250 12 pack incl.DuropermCP 290ml

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