

IMPRESSED CURRENT ANODES

Mixed metal oxide (MMO)

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German Cathodic Protection



Mixed metal oxide (MMO) anodes

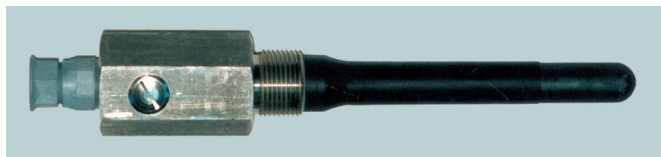
This material consists of a high purity titanium substrate with an applied mixed metal oxide coating consisting of a mixture of oxides. The titanium serves as a support for the oxide coating. The titanium functions as a valve metal by forming thin, self-healing, adherent oxide film which is acid resistant does not conduct anodic current. The oxidefilm is formed on the titanium substrate by thermal decomposition of precious metal salts that have been applied the substrate.

Technical data

Base metal	Titanium
MMO coating, standard	12 g/m ²
MMO layer thickness	approx. 5.0 µm
Max. phase/interphase voltage	8.0 V
Max. current density	11 A/dm ²
Consumption rate	approx. 0.01 g/A year

Rod anodes

Screw-in type rod anodes with pressure resistant head structure are widely used for the internal protection of pipes, tanks, condensers and other process equipment.



Dimensions

Rod length	150 up to 2500 mm
Rod diameter	4 / 6 / 8 / 10 / 12 / 16 / 20 / 25 mm

Plate anodes

Plate anode structure consists of anode plate assembled and sealed inside a support frame made of impact resistant plastic material.

Plate anodes are used for offshore structures and sluices.

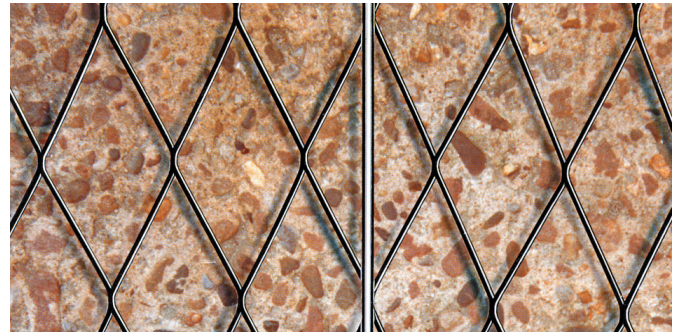


Dimensions

Plate length	max. 800 mm
Plate width	max. 800 mm
Plate thickness	0.5 - 10 mm

Mesh anodes

Mesh anodes are used for the protection of steel reinforced concrete structures.



Max. current density	18.0 mA/m ²	27.5 mA/m ²	33.0 mA/m ²
Coating	Mixed precious metal oxide	Mixed precious metal oxide	Mixed precious metal oxide
Substrate (Grade 1/ASTM B265)	Titanium	Titanium	Titanium
Width per coil	1 m	1 m	1 m
Length	10 m	10 m	10 m
Weight	120 to 130 kg	220 to 230 kg	220 kg
Mesh size	76 x 35 mm	76 x 35 mm	62 x 20 mm
Resistivity, longitudinal direction	0.120 Ω/m	0.060 Ω/m	0.060 Ω/m
Current distributor wire, diameter	3 mm	3 mm	3 mm
Length (uncoated)	100 m	100 m	100 m
or Current distributor flat profile			
Thickness	1 - 1.5 mm	1 - 1.5 mm	1 - 1.5 mm
Width	5 - 10 mm	5 - 10 mm	5 - 10 mm
Length (uncoated)	1 m	1 m	1 m

Tubular anodes

Tubular anodes are assembled as anode chain for deep groundbed installations. The centre connected cable ensures that current can pass from the centre of one tube to the next. The materials used for the different parts of anodes and anode chains are suitable for satisfactory performance in areas with low pH-value and high chloride/chloride concentrations.



Dimensions

Tube length	1000 - 2500 mm
Tube diameter	25.4 / 32.0 / 40.0 / 45.0 / 50.8 mm

All weights and dimensions are nominal and subject to variation in material compositions.