METAKEM

CCP

Metakem is a leading producer of titanium and niobium based anodes and anode systems for cathodic protection. Metakem supports engineering companies in the field of cathodic protection with the anode design and finally produces these anodes for the specific applications of his clients. Metakem gathered experiences from all over the world with the cathodic protection of on- and offshore constructions, marine structures, mechanical equipments and industrial plants. Metakem's expertise on cathodic protection systems his proven production technology results in high quality products, innovative solutions and practical knowledge, very useful for the customers of cathodic protection around the world.

MMO coated titanium anodes

Titanium is chemically resistant and mechanically robust. The substrate is activated with a MMO (mixed metal oxides) layer, which has excellent elctro-catalytic properties. Oxygen and/or chlorine are evolved at low and stable anode potentials. The MMO-layer contains oxides of non-precious and platinum group oxides. The electrochemical properties of these mixtures have been optimised in respect of their different demands. The simultaneous generation of chlorine and oxygen on the MMO surface in sea, brackish and fresh waters are very severe conditions for anodes. But extremely low wear rates in different environments are reached.

Around anodes very acidic conditions can be reached in stagnant water. A special development was necessary to make the MMO-titanium anodes rigid against these aggressive conditions. Not only the stability of the outer MMO, much more the stability of the titanium base and the interlayer between titanium and the MMO were important.

MMO anodes have a long lifetime up to 20 years and a low wear rate.

Platinum coated niobium anodes

Platinised niobium has been introduced over the last 20 years for critical purposes. the niobium (columbium) is highly corrosion resistant – it's breakdown potential is 5 to 10 times higher than that of titanium, so this metal gives the advantage that the platinum layer can not be under-etched even at high impressing voltages. Offshore installations can be designed with few anodes and high impressing voltage. A niobium base is preferred to titanium for heavily loaded anodes or anodes for which the replacement is difficult or for conditions of low water-conductivity. Above this niobium is resistant against very acid conditions and allows very save and stable submerged current contacts.

These anodes offer advantages compared with all "semi-dimension-stable" anodes like silicon-iron, magnetite, graphite. The impressed current system is easily controlled, but the anode's lifetime reflects the lifetime of the installation. The possibility to machine titanium as well as niobium to customer design allows very secure constructions. The chosen design is depending from the application and from the location of there use. The anode lifetime depends on the wear rate of the activating layer and stability of the interlayer to base, a lifetime of more than 20 years can be achieved.

Design of the anodes

Today all thinkable shapes of anodes are available. The includes tailor made anodes to customer's requirement in the following forms: rods, wire, tubes, discs, sheet, expanded mesh, strip, welding and chain anode constructions. For the quality of the anode systems the connection between the anode and the power supply is always critical. To do a well designed connection also the mechanical loads should be known.

Gold and platinum group metal chemistry
- Salts, compounds and solutions
- Gold and PGM electroplating baths
- PGM coated parts

Insoluble Anodes
- Titanium and niobium parts
- Customized anodes
- Special base metals and activations

Shaped Material
- Platinum and platinum/rhodium alloys

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