Applications

Cathodic Protection

In modern UHP hydrometric, Titanium and Nichrome anodes are used, to realise a continuous current density distribution and a low Water, the anodes are applied with a thin layer of Platinum or Keramox® coating.

Frequently used applications are:
- Cathodic protection of bridges, viaducts, tanks, storage tanks, power plants, heat exchangers and pipelines.
- Industrial protection by gas extraction, platforms and offshore constructions, power plants, refineries, oil rigs and power stations.

Water Treatment

Precious metal plating (gold, silver, palladium, etc.)
- Copper plating, copper foil production and copper foil treatment
- Reverse Pulse Plating
- Aluminium anodising in liquid-contact-cells.
- Electrochemical recovery of metals (Ni, Cd, Cu, Zn, Sn, Ag, Au, etc.)
- Direct or indirect oxidation and breakdown of organic contamination or cyanide
- Removal of small solid particles by means of electroflocculation
- Electrodialysis, desalination of process water and electroflotation
- Softening of water, de-scaling
- Membrane processes.
- Hydrogen production by water electrolysis.
- The production of chromic acid
- The oxidation of Ce³⁺ in Ce⁴⁺

Electroplating

Electro galvanising (zinc plating), including steel strip plating
- Precious metal plating (gold, silver, palladium, etc.)
- Nickel/chromium plating, nickel plating, tin plating, silver plating
- Copper plating, copper foil production and copper foil treatment
- Reverse Pulse Plating
- Aluminium anodising in liquid-contact-cells.
- The principle of metal plating is almost identical for all applications. The metal to be plated is dissolved in the electrolyte and the object to be plated is immersed in the electrolyte. At the anode, the metal ions are oxidised. The current is received in the plating bath which contains a wide range of products.

Water Treatment

Our anodes are used in processes such as potable water treatment, treatment of process water and wastewater, but also for recovery and separation of valuable or environmentally hazardous materials. For instance:
- Electrochemical recovery of metals (Ni, Cd, Cu, Zn, Sn, Ag, Au, etc.)
- Direct or indirect oxidation and breakdown of organic contamination or cyanide
- Removal of small solid particles by means of electroflocculation
- Electrodialysis, desalination of process water and electroflotation
- Softening of water, de-scaling
- Membrane processes.

Synthesis Reactions

MAGNETO special anodes BV

Synthesis Reactions

At present, anodes are available for several inorganic conversions and oxidation reactions. Some new applications are:

- The production of TiO₂
- The production of NaN₃
- The production of CH₃Cl
- The production of C₂H₅Br
- Hydrogen production by water electrolysis.
Quality System

Our Management System has been operational for a long time and has been optimised in such a way that getting our awarded certification according to the new standard: ISO 9001:2008 is an administrative activity for us. The performance of Research & Development and all our supporting and auxiliary processes are within our control. "Reliability" and "fit for use" are the keywords when it comes to quality at MAGNETO special anodes B.V. This starts during the first contact with the customer, when the specifications for a coating are determined. In the following steps, all parts of the production process are looked at to make sure an optimum quality is achieved.

In case that none of our existing coating specifications meet the specific needs of a customer, we will develop a coating specification in co-operation with our customer that will fully satisfy the requirements.

A significant part of our turnover is dedicated to research and development of our coating specifications and to the development of new coating techniques. Together with our customers, our objective is always to develop a coating specification that will fully satisfy the requirements of a customer's application or special conditions.

The electrochemical cell or installation wherein the anodes are used differs in every application. The products of MAGNETO special anodes B.V. are determined by the characteristics of this electrochemical cell or installation. The process conditions, such as electrolyte composition, temperature, current density, design life, etc., are determined by the characteristics of this electrochemical cell or installation. Important parameters determining the anode design are:

- The type and composition of the electrolyte
- The voltage at which the anode is used
- The current density at which the anode is used
- The mechanical load of the anode
- The capacity of electrical conductivity of the base material

Most of our clients are either producers of complete electrochemical cells and production systems (Engineering and Equipment Manufacturer) or end-users. In several countries we work in close co-operation with local agents or specialised distributors.

In several foreign countries and in several applications, we are proud to say that our anodes are exported and used over the world. Most of our clients are either producers of complete electrochemical cells and production systems (Engineering and Equipment Manufacturer) or end-users. In several countries we work in close co-operation with local agents or specialised distributors.

Introduction

MAGNETO special anodes B.V. was founded in 1957 under the name of MAGNETO CHROME B.V. and is the original inventor and manufacturer of titanium anodes with Ruthenium and Ruthenium-Based coatings.

The study shows the production and the continuous development of inert anodes have given MAGNETO special anodes B.V. a prominent position in the market for titanium anodes.

In the middle of 2002, the name was changed to MAGNETO special anodes B.V., which combines the well-known name of MAGNETO and our specialisation in the production of special anodes.

We are located in Helmond, in the industrial heart of the Netherlands, close to important access by road, air and water.

Even though Western Europe is our main market, we are proud to say that our anodes are exported and used over the world. Most of our clients are either producers of complete electrochemical cells and production systems (Engineering and Equipment Manufacturer) or end-users. In several countries we work in close co-operation with local agents or specialised distributors.

In several foreign countries and in several applications, we are proud to say that our anodes are exported and used over the world.
Already in the early 90’s we had Lloyd’s Register Assurance. This had been optimised in such a way that getting our awarded certification according to the new standard: ISO 9001:2000, was no problem for us. The only pre-requisites were:
- Managing our processes and products in a way to maintain the quality and safety of our end products, customers and employees.
- Measuring our performance and adjusting where necessary.
- All other pre-requisites were in such a degree that our customers were completely satisfied, our engineers were proud of the knowledge they had gained and the clients together with their best friends.

In 2001 we were one of the first Dutch companies to be awarded the ISO 9002:2000 (now ISO 9001:2008) certificate. This was a great achievement for us. The supply of the most suitable anodes possible is paramount for our customers and for MAGNETO special anodes B.V. “Reliability” and “fit for use” are the keywords when it comes to quality. This starts during the first contact with the customer, when the specifications are developed in co-operation with our customer that will fully satisfy the needs and demands of our customer, in accordance with the agreed specifications and/or standards.

Because of a very flexible production facility, we are able to manufacture anodes of all types: sheet, plate, mesh, wire, rod, anodes of all sizes 1 to 10,000 pieces. The process in which the anodes are used determines size, shape and coating specification of an anode. Important parameters determining the anode design are:
- Electrolyte conditions (electrolyte composition, temperature, current density, design life, etc.),
- Electrode conditions (oxygen, air, water).
- Electrochemical conditions (polarization, overpotentials, etc.).
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- Electrode conditions (oxygen, air, water).

The steady growth of the production and the continuous development of new anodes have given MAGNETO special anodes B.V. a prominent position in the market for Titanium anodes.

In the middle of 2000 the name was changed to MAGNETO special anodes B.V., which combines the well known name of MAGNETO-CHEMIE B.V. and our specialization in the production of special anodes.

We are located in Twello, in the industrial heart of the Netherlands, close to important access by road, air and water.

Even though Western Europe is our main market, we are proud to say that all our anodes are exported and used over the world. Most of our clients are either producers of complete electrochemical cells and production systems (Engineering and Equipment Manufacturer) or end-users.

In several countries we work in close co-operation with local agents or specialized distributors.

Our research & development includes the continuous and extensive development, both in our own laboratory as well as at universities and other research institutes.

A significant part of our turnover is dedicated to research and product development, both on our own initiative and on customer demand. The majority of our products consist of tailor made anodes, custom developed and produced for applications specified by our customers. This results in highly advanced anodes, especially for the market of inert anodes, to guarantee continuity to enterprises within the legal frame in all her aspects and also in an ethical responsible way.

Because of this continuous and extensive development, we are able to supply the most suitable anodes possible in all aspects of the market.

In case that none of our existing coating specifications meet the specific needs of a customer, new applications and conditions, our engineers are specialising in the development of a new coating. The steady growth of the production and the continuous development of new anodes have given MAGNETO-CHEMIE B.V. a prominent position in the market for Titanium anodes.

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Profile
MAGNETO special anodes B.V. is a technology driven, customer oriented company. The majority of our products consist of inert anodes. In order to meet specific needs of our customers, we are working in close cooperation with international research institutes with whom we work in close co-operation. Our engineers are responsible for the development of the most suitable anode and in close contact with end-users. In this way, a close link is formed between the needs of the customer and the existing possibilities of our company. In this way, a continuous development of inert anodes can be achieved.

Introduction
MAGNETO special anodes B.V. was founded in 1957 under the name of MAGNETO CHROME B.V. and is the original inventor and manufacturer of Titanium anodes with Ruthenium and Ruthenium oxide coatings.

The steady growth of the production and the continuous development of inert anodes have given MAGNETO CHROME B.V. a prominent position in the market for Titanium anodes.

In the middle of the sixties, the name was changed to MAGNETO special anodes B.V., which combines the well-known name of MAGNETO and our specialization: the production of the special anodes.

We are located in Drieluik, the industrial heart of the Netherlands, close to important access by road, air and water.

Even though Western Europe is our main market, we are proud to say that our anodes are exported and used all over the world. Most of our clients are either producers of complete electrochemical cells and production systems (Electroplating Equipment Manufacturers) or end-users.

In several countries we work in close co-operation with local agents or specialised distributors.

Policy Statement

Our purpose is to produce and market products which conform to the requirements of our customers.

MAGNETO special anodes B.V. strives to achieve this goal by:

- To produce an anode in an improved manner, where the market conditions, the technical possibilities of our company, the wishes of our customers and the standards are taken into account.
- To work strictly by the technical possibilities of our company.
- To give due regard to the wishes of our customers.
- To deliver an anode in an improved manner, where the market conditions, the technical possibilities of our company, the wishes of our customers and the standards are taken into account.
- To achieve the highest possible quality of anode production.
- To create the safest possible working conditions.
- To achieve the best possible protection of the environment.

In order to achieve a maximal impact on the environment, we are looking into possibilities to improve the production process, without looking at our products, but also looking at our products. Our anodes are available.

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MAGNETO special anodes B.V. has developed and implemented a policy of quality assurance, in accordance with the agreed specifications and/or standards.

Our customers, our suppliers and our employees.

To strive to a minimal impact on the environment. Not just looking at our own production process, but also looking at our products. Our anodes are available.

In case that none of our existing coating specifications meet the specific needs of a customer’s application or special conditions, our objective is always to develop a coating specification in co-operation with our customer that will fully satisfy the customer or end-user.

In order to achieve a maximal impact on the environment, we are looking into possibilities to improve the production process, without looking at our products. Our anodes are available.

PRODUCTS

Anodes of any kind can be manufactured on request. Some of the more important types of inert anodes, to guarantee continuity to the market of inert anodes, to guarantee continuity of inert anodes, are determined. In the following steps, all parts of the production process are looked at to make sure the specifications will be met.

The supply of the most suitable anodes possible is paramount for our customers and for MAGNETO special anodes B.V. Our engineers are pleased to use their knowledge and experience to finalise the design together with the customer.

Our anodes are available.

QUALITY

Management System

Already in the early eighties we had started formulating and implementing an appropriate production system and other procedures. By now our Management System had been operational for a long time and had been approved in each way. Getting our first ISO certificate in 1980 for our electrochemical cell installation was only a formality.

In 2000 we were one of the small Dutch companies to be awarded certification according to the new standard DIN EN 9000-2. Our first certificate is awarded by one of the world’s best known organizations in this field: Lloyd’s Register Quality Assurance.

ISO 9000

Quality Assurance

The supply of the most suitable anodes possible is paramount for our customers and for MAGNETO special anodes B.V. Therefore, we are striving for the dependability and consistency to qualify at ISO 9000 and the other certifications.

We have made a number of changes in all stages that are necessary to produce anodes with the same quality. This guarantees the customer, when the specifications are achieved and used, that the finished products are in line with these specifications.

In order to achieve a maximal impact on the environment, we are looking into possibilities to improve the production process, without looking at our products. Our anodes are available.
Applications

Cathodic Protection
In modern ICCP systems, Titanium and stainless steel anodes are used. To realise a continuous current electrical conduction and a long lifetime, the anodes are applied with a thin layer of Platinum or Palladium coating.

External protection of pipelines, ship hulls, platforms and other offshore constructions, piers, dams and cooling water inlet parts of power stations.

Precious metal plating (gold, silver, palladium, etc.)

(C)hromium plating, nickel plating, tin plating

Copper plating, copper foil production and copper foil treatment

Reverse Pulse Plating

Aluminium anodising in liquid-contact-cells.

Electrochemical recovery of metals (Ni, Cd, Cu, Zn, Sn, Ag, Au, etc.)

Direct or indirect oxidation and break-down of organic contamination or cyanide

Removal of small solid particles by means of electroflocculation

Electrodialysis, desalination of process water and electroflotation

Softening of water, de-scaling

Membrane processes.

Hydrogen production by water electrolysis.

The oxidation of Ce₃⁺ in Ce₄⁺

Internal protection of storage tanks, condensers, tank bottoms, pipes, pipelines, heat exchangers and boilers

Electro galvanising (zinc plating), including steel strip plating

(C)hromium plating, nickel plating, tin plating

Copper plating, copper foil production and copper foil treatment

Reverse Pulse Plating

Aluminium anodising in liquid-contact-cells.

Electroplating

In the electroplating industry our oxygen evolving anodes are used for:

◆ Electroplating of贱 metals, including nickel plating

◆ (C)hromium plating, nickel plating, tin plating

◆ Copper plating, copper foil production and copper foil treatment

◆ Reverse Pulse Plating

◆ Aluminium anodising in liquid-contact-cells.

Water treatment
Our anodes are used in processes such as in stand water treatment, treatment of process waste and sewerage. It also for recovery and separation of valuable or environmentally hazardous materials. For instance:

◆ Electroplating of贱 metals

◆ (C)hromium plating, nickel plating, tin plating

◆ Copper plating, copper foil production and copper foil treatment

◆ Reverse Pulse Plating

◆ Aluminium anodising in liquid-contact-cells.

Hypochlorite & Disinfection
The availability of Titanium anodes has been a major break-through for the on-site production of hypochlorite for potable water treatment and for both private and public swimming pools. The use of Titanium anodes for on-site generation of hypochlorite is both safer and more environment friendly than the alternative storage and use of chlorine gas or bulk hypochlorite. By using Titanium anodes, the use of highly corrosive and dangerous chemicals, such as hydrochloric acid, can be avoided.

Synthesis Reactions
MAGNETO special anodes B.V. started to do research years ago, to search for the possibilities of using special anodes for several electrochemical synthesis reactions.

◆ Synthesis of rare earths
◆ Synthesis of metals
◆ Separation of valuable or environmentally hazardous materials. For instance:

◆ Electroplating of贱 metals

◆ (C)hromium plating, nickel plating, tin plating

◆ Copper plating, copper foil production and copper foil treatment

◆ Reverse Pulse Plating

◆ Aluminium anodising in liquid-contact-cells.

The principle of metal plating is almost identical for all applications. The metal to be plated is dissolved in the electrolyte and the object to be plated is cathodically polarised. With the anodically polarised anodes, the electrical loop is closed. The counter reaction in the plating bath is oxygen evolution at the anode surface.

Cathodic Protection

In modern ICCP systems, Titanium and Niobium anodes are used. To realise a continuous current electrical conduction and a long lifetime, the anodes are applied with a thin layer of Platinum or Palladium coating.

Frequently seen applications are:

◆ Cathodic protection of pipelines, ship hulls, platforms and other offshore constructions, piers, dams and cooling water inlets.

◆ Industrial protection of ships, stacks, platforms and offshore constructions where electrochemical protection is necessary.

Seawater/Desalination

The invention of the Titanium anode has been of paramount importance for the electrolysis of seawater. Well known applications are:

Seawater Electrolysis (anti bio-fouling)

The oxidation of Ce₃⁺ in Ce₄⁺

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Applications

Cathodic Protection

In modern ICCP systems, Titanium and Titanium anodes are used. To realise a continuous current and cathodic protection, the anode is applied with a thin layer of Titanium or Titanium+ coating.

Frequently used applications are:

- Cathodic protection of steel, concrete, metal, backhoes, piping systems, heat exchangers, etc.
- Industrial protection of ships, offshore platforms and other offshore constructions, pens in water and sewage plants, etc.
- Various other applications in the marine industry.

Seawater Electrolysis (Anti-fouling)

The invention of the Titanium anode has been of paramount importance for the electrolysis of seawater, such as applications for the prevention of algae growth on ships, platforms and cooling water installations of, for instance, power plants.

Electroplating

Modern electroplating industry uses special anodes and the following:

- Electro-galvanic fine plating, nickel plating, silver plating
- Precision metal plating (galv. chrome, parkass etc.)
- Selective chromium plating, color plating, tin-plating
- Copper plating, copper for decorative and copper foil treatment
- Reverse Pulse Plating
- Aluminium anodising in liquid-contact-cells.

- Electrochemical recovery of metals (Ni, Cd, Cu, Zn, Sn, Ag, Au, etc.)
- Direct or indirect oxidation and breakdown of organic contamination or cyanide
- Removal of small solid particles by means of electroflocculation
- Electrodialysis, desalination of process water and electroflotation
- Softening of water, de-scaling
- Membrane processes.

Hydrogen production by water electrolysis.

- The production of chromic acid
- The oxidation of Ce3+ in Ce4+

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