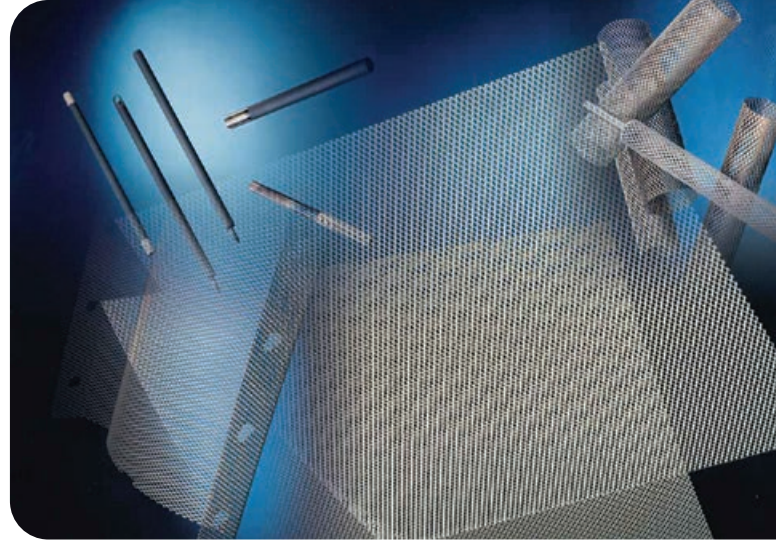


MAGNETO®
SPECIAL ANODES
SOLUTIONS FOR THE
ELECTROCHEMICAL
INDUSTRY



About Us

Magneto Special Anodes from Evoqua provide electrochemical industry product owners an optimal electrode technology solution delivering efficient and reliable operational requirements

As a leading manufacturer and innovator of inert Titanium based anodes with customized active precious metal coatings, we can provide solutions for electrowinning and recovery, water treatment, metal plating, and impressed current corrosion protection for onshore and offshore structures.

Our product experts have been providing flexible, high-quality electrode technology solutions for over 60 years meeting precise specifications and delivering long-lasting results with minimal impact on the environment.

Electrode Technology

Anodes are used in the production of the cars we drive, phones we use, water we drink and water we swim in. Developing the appropriate anode solution to meet application requirements is key and can lead to substantial cost savings for electrochemical product and process manufacturers.

ANODE DESIGN AND MANUFACTURING PROCESS

Magneto® Special Anode electrochemists and engineers collaborate with original equipment manufacturers' (OEMs) and system integrators to understand applications. Our experts ensure anode design meets precise specifications and quality is monitored in all stages of the manufacturing process to ensure an efficient, long-life electrode solution.

Magneto Anode experts evaluate product and process specifications and parameters to determine the anode design based on conditions which include, electrolyte composition, temperature, current density, and lifecycle. Anodes are available in a wide variety of configurations, which include tubular, ribbon, wire, mesh, sheet or plate to meet product or process requirements.



Skilled coating operators ensure each anode is coated to precise application requirements

During the first step of the manufacturing process, the anode is etched or blasted to clean and roughen the surface for the adhesion of a mixed metal oxide (MMO) or platinum coating. This step is followed by the application of the coating. The coating is then converted into an electrocatalyst during a heat treatment step. Our skilled coating operators ensure each anode is coated evenly and at the correct loading to ensure high quality conductivity and minimize waste of expensive precious metals and raw materials.



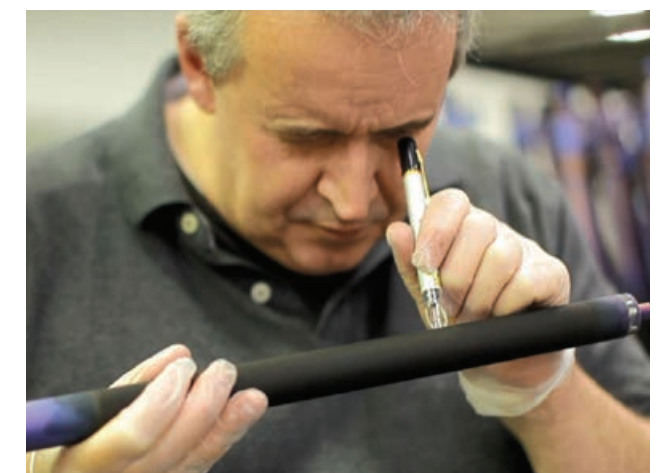
Magneto® Special Anodes are available for a variety of applications with customized mixed metal oxide or platinum coatings to meet application requirements.

COATINGS TO MATCH PRECISE REQUIREMENTS

Mixed metal oxide coatings are composed of thin ceramic layers of ruthenium oxide or iridium oxide. Platinum is used in a pure electroplated form.

TITANIUM ANODE WITH MMO COATING BENEFITS

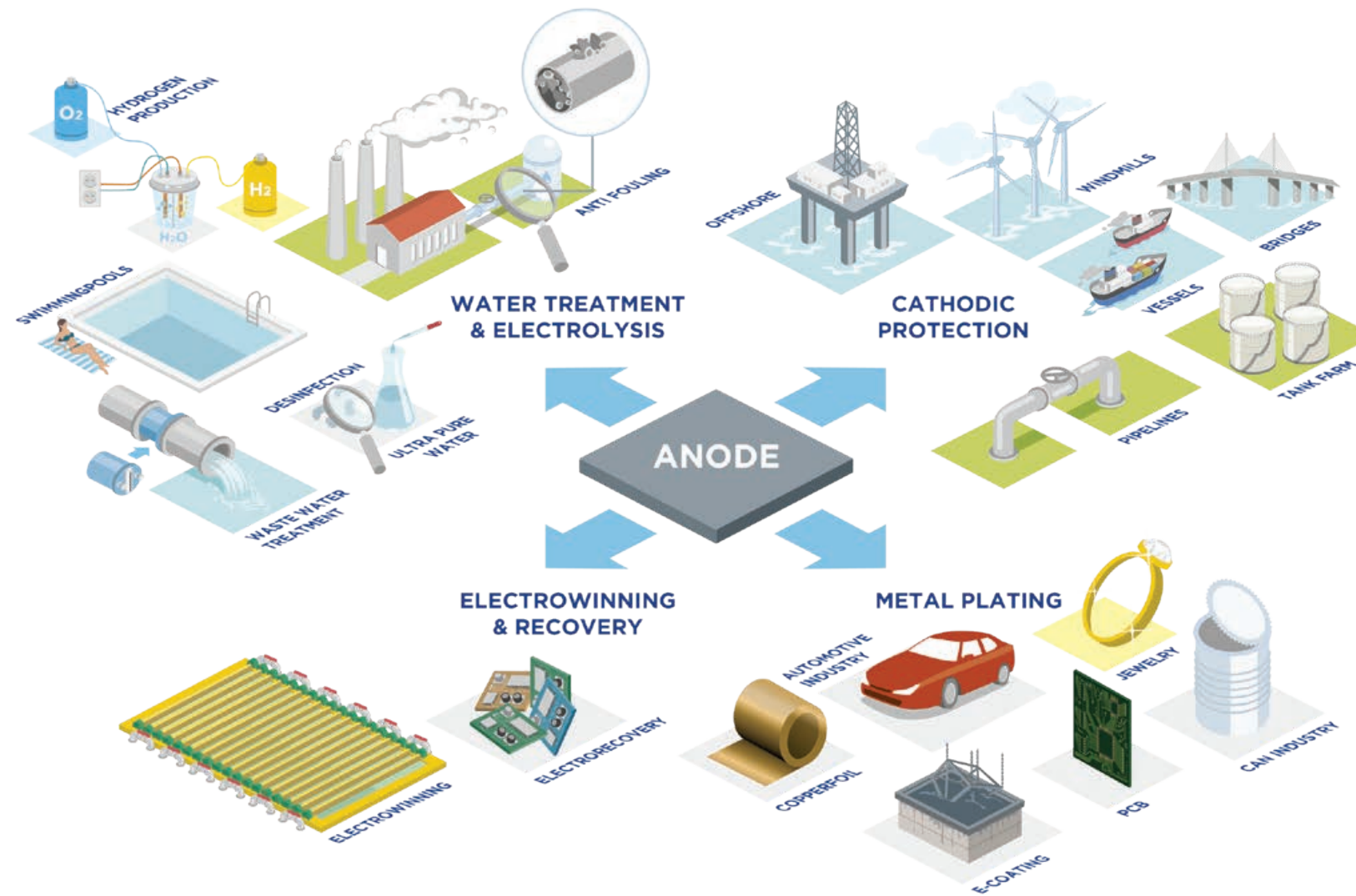
- Excellent adherence properties with proper surface preparation.
- Durable, long-life electrode technology
- Superior chemical resistance to highly acidic conditions
- Quality manufacturing and testing
- Energy efficient lowering lifecycle costs



Quality is apparent in all phases of the anode manufacturing process to ensure a superior reliable product

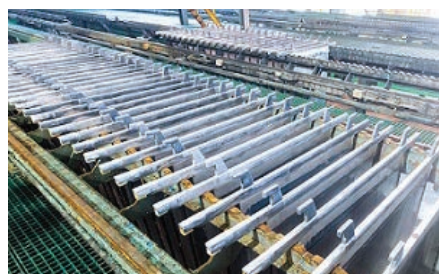
WATER TREATMENT

Magneto Anodes can be used in the treatment of potable water, process water and wastewater treatment, and swimming pool water applications. Our Anodes have also been used for electro dialysis, (reverse) electro deionization (EDR), softening of water, de-scaling, direct and indirect oxidation and for the break-down of organic contamination or cyanide, removal of small solid particles by electroflotation and membrane processes.



ELECTROWINNING & RECOVERY

In electrowinning, valuable metals are taken from leachate or metal-rich electrolytes by depositing them on the cathode. In electro recovery, metals such as Ni, Cd, Cu, Zn, Sn, Ag, and Au are recovered from process water or wastewater. These processes require efficient and non-contaminating anodes for which precious metal coated titanium anodes are the perfect fit.

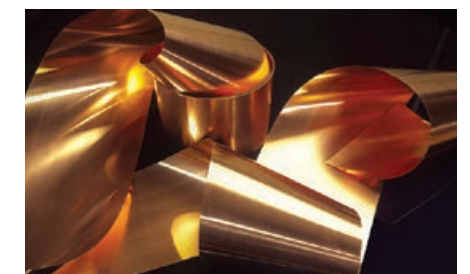


CATHODIC PROTECTION

Designed to protect metal surfaces, our anodes for impressed current cathodic protection (ICCP) provide a reliable, long life, and low maintenance solution. To realize a continuous current electrical conductivity for ICCP to be effective, titanium anodes are applied with a thin layer of platinum or mixed metal oxide (MMO) coating. These coatings serve a wide range of output current densities, while coated niobium anodes are well applicable at high voltages. Our coated MMO anodes for ICCP applications are certified by DNV-GL in accordance with NACE TM0108-2012 standards.

METAL PLATING

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 polarized. Our anodes close the electrical loop and are designed to ensure a long life, stable geometry, lower environmental issues (like lead), superior strength, and the best possible performance in many industrial processes. Our anodes can also be used in many metal finishing applications such as electrophoretic deposition (e.g. E-Coating) and aluminum anodizing applications.



Quality and Sustainability

Magneto's focus on quality is apparent in all phases of the anode manufacturing process ensuring a superior, reliable product which is guaranteed by our integral quality management system. Magneto Anode coatings have been proven for their exceptional durability, lower life-cycle cost and long-life. Our MMO and platinum coatings offer an energy efficient, corrosion resistant solution for demanding applications.

Through our experience and expertise we are uniquely positioned to enable the electrochemical industry to become more sustainable.

Our innovative solutions can help with the production of Lithium batteries for electric cars and can enable the process of water electrolysis to produce renewable green hydrogen production. Magneto Anode experts continually research and develop electrolytic anode solutions to help solve electrochemical challenges across a wide range of applications.



Our innovative anode products are carefully developed using several decades of research and in-field experience to deliver effective solutions for the electrochemical industry. Our engineers leverage meticulous lab testing and performance data systems to ensure each electrode technology solution delivers optimum results in its intended application.

Innovative Solutions



HYDROGEN PRODUCTION

A green economy will increasingly make use of hydrogen produced by water electrolysis, which is expected to play a pivotal role in the future energy landscape.



WATER REUSE & WASTEWATER TREATMENT

Global stress on fresh-water resources leads to the increased reuse of brackish water and treated process and wastewater. Using electrodialysis (EDI) and (EDR), a electrochemical technology provides the removal of salts from these waters to enable reuse of water.

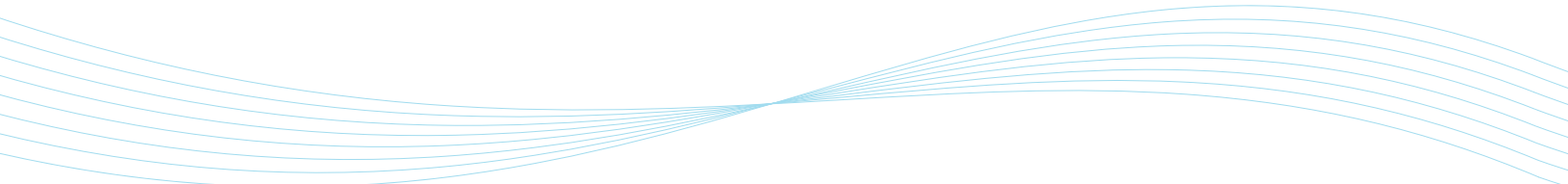


AUTOMOBILE INDUSTRY

For the automobile industry, Magneto's anodes are used to support the electric car market by helping with the production of specialized copper foil used in Lithium battery production. Magneto Anode coatings are also used in the general automotive market with the protective coating of steel in the electrogalvanizing process and metal plating processes, producing functional or decorative plated layers like chromium, nickel, or zinc-nickel.

MAGNETO SPECIAL ANODES HELP INDUSTRIES DELIVER PRODUCTS AND PROCESSES WITH MINIMAL IMPACT ON THE ENVIRONMENT.





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