

# OPTIMUM ANODE TECHNOLOGIES™

## Optimum Cathodic Protection



Optimum Anode Technologies™ Inc., a business affiliate of Titan Metal Fabricators, combines the excellent reputation and manufacturing know-how of Titan Metal Fabricators, a leading supplier of titanium and other exotic metal fabrications, with the industry experience of Optimum Anode Technologies™ management in the manufacture of dimensionally stable anode coatings. Our industry experts have more than 25 years of experience in anode technology and manufacturing as well as market expertise in supplying cost-effective products that meet or exceed our customers' dimensionally stable anode needs.



## Optimum Cathodic Protection

Optimum Anode Technologies™ is a high-quality provider of cost-effective dimensionally stable anodes that are both reliable and cost competitive for most cathodic protection applications. We supply mixed-metal-oxide (MMO) and platinum catalytic coatings that are sintered to a titanium substrate, providing an anode that is both lightweight and durable. Our proprietary catalysts are suitable for use in a wide range of cathodic protection applications, including soil, carbonaceous landfill, fresh water, brackish water, and seawater. Our high-value metal substrates assure high corrosion resistance.

## Precious Metal Coatings That Last

Our OptimumOxides™ series of precious metal oxide coatings have a primary coating of ruthenium, iridium, platinum, or palladium. The primary precious metal oxide can be combined with other precious metals and/or other valve or base metal oxides to produce an MMO coating that makes a highly efficient, robust electrochemical catalyst that can provide many years of uninterrupted service.

IROxide™, part of our OptimumOxides™ series, is the name of our iridium oxide series of anode formulations whose primary precious metal, iridium, is converted into oxide for the energy-efficient production of oxygen. Depending on the environment and your specific requirements, the iridium can be combined with other precious metal and/or base metal oxides to produce the optimum electrochemical catalyst for specific process conditions and the desired operating performance and product results. IROxide™ robust coatings are formulated to withstand a range of acidic environments.

Our PurePlat™ coatings are high purity platinum that meet or exceed the industry standard and may be applied to titanium, niobium, tantalum, and other exotic substances. Their electro-deposited or clad-coated substrate is more cost-effective than, and mechanically superior to, pure platinum structures. Moreover, PurePlat™ coatings provide optimum performance by varying the surface morphology to create an application- and process-specific electrochemical characteristic.

## Expert Selection

Coatings are selected by our technology experts, but only after first listening to the specifics of your application. This helps identify the details and nuances of the technical, operational, and financial aspects of your desired business goals.

## Energy-Efficient

Optimum anodes optimize energy consumption, operating at low anodic potentials for a selected environment. The coatings selection assures the right balance of energy efficiency and life. In addition, the dimensional stability of our anodes keeps energy consumption low throughout the design life of the anode.







## Environmentally Safe

Optimum anodes are non-toxic, insoluble, and lead-free. With no hazardous materials to worry about, our anodes can easily be recycled or scrapped and will not be the cause of any environmental liabilities in the future.

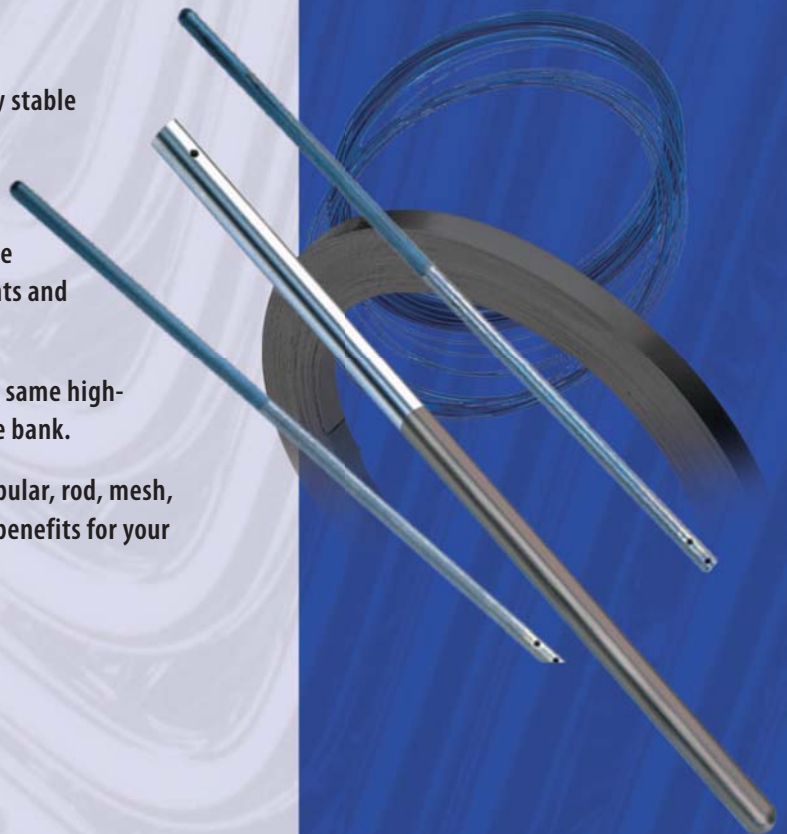
## Standard or Custom Parts – Your Choice

Maximize your cathodic protection with dimensionally stable anode products from Optimum Anode Technologies™.

Choose from our family of standard, high-performance offerings. However, if your needs go beyond off-the-shelf solutions, we are ready to provide a custom design that best fits your special requirements and provides the greatest benefits.

Standard or custom, all our anodes are made from the same high-quality manufacturing process – without breaking the bank.

Choose from a wide array of shapes – wire, ribbon, tubular, rod, mesh, or custom manufactured parts – to reap the greatest benefits for your particular application.





## Anode Shapes

## Key Benefits



Titanium Wire

- Lightweight – e.g., 100 feet of titanium wire weighs less than 2.5 lbs.
- Ductile – can be tied in a knot without damage.
- Composite materials eliminate problems with breakage of brittle material such as graphite and silicon iron.
- Dimensional stability eliminates associated problems with connection seals.
- Compatible with widest range of cathodic protection media (water, coke, seawater, brackish water).
- Superior corrosion resistance vs. graphite and silicon iron.
- Long life.
- Ideal for: storage tanks, pipelines, water heaters, cable shielding, linear anode systems, canister anodes.



Ti-Clad  
Copper Wire

- Lightweight – e.g., 100 ft weighs less than 2.5 lbs.
- Ductile – can be tied in a knot without damage.
- Composite materials eliminate problems with breakage of brittle material such as graphite and silicon iron.
- Dimensional stability eliminates associated problems with connection seals.
- Compatible with the widest range of cathodic protection media (water, coke, seawater, brackish water).
- Lower electrical resistance vs. solid titanium.
- Long life.
- Ideal for: storage tanks, pipelines, water heaters, cable shielding, linear anode systems, canister anodes.



Tubular

- Lightweight – e.g., typical tube weighs less than 1 lb.
- Composite materials eliminate problems with breakage of brittle materials such as graphite and silicon iron.
- Dimensional stability eliminates problems associated with connection seals.
- Compatible with the widest range of cathodic protection media (water, coke, seawater, brackish water).
- Highest current capacity per anode.
- Installed ground bed costs can be 20-50% less than with silicon iron and graphite.
- Long life.
- Ideal for: underground structures (well casings, pipelines storage tanks), concrete and steel piers, pilings and bulkheads.



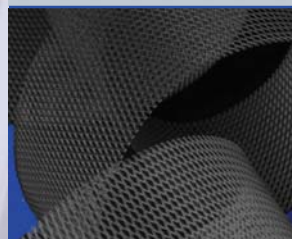
Ribbons

- Lightweight – e.g., 100 ft of the ¼-in. (6.35 mm) ribbon weighs slightly more than 1 lb.
- Composite material eliminates the brittle issues encountered with graphite and silicon iron.
- Dimensional stability eliminates issues associated with connection seals.
- Compatible with a wide range of cathodic protection media (fresh water, coke, seawater, brackish water).
- Superior corrosion resistance vs. graphite, silicon iron, and other alternative materials.
- Conveniently cut and welded in the field to suit various geometries.
- Long life.
- Ideal for: storage tanks, concrete.



Rods

- Lightweight - e.g., typical titanium rod weighs just 0.13 lb per ft at ½-in. diameter.
- Composite materials eliminate problems with breakage of brittle material such as graphite and silicon iron.
- Dimensional stability eliminates issues associated with connection seals.
- Compatible with a wide range of compatible protection media (fresh water, coke, seawater, brackish water).
- Long life.
- Ideal for: power plant heat exchangers/water boxes, jetties.



Mesh

- Lightweight – e.g., a 250-ft coil of ribbon mesh weighs just 4-8 lbs.
- Ductile – composite material exhibits characteristics of the titanium substrate, which is highly malleable.
- Dimensional stability assures excellent contact with media and a stable surface for seals.
- Compatible with a wide range of compatible protection media (fresh water, coke, seawater, brackish water).
- Conveniently cut and welded in the field to suit various structures and geometries.
- Long life.
- Ideal for: concrete structures, parking garages, bridge decks.



Custom  
Manufactured  
Parts

- Complex shapes that best fit your application - e.g., ellipsoids, spheres or any special form you require.
- Choose the best coating for your custom fabrication, including niobium, tantalum, aluminum, zinc, or magnesium (in addition to ruthenium, iridium, platinum, or palladium).



## Reliable Turnaround

Optimum Anode Technologies™ is committed to providing a quality product in a timely manner that meets or exceeds our customers' technical and operational needs. We continually apply our unique fact-finding and discovery consultative selling process to provide the most cost-effective solution, whether standard or custom-designed. Our quality and our turnaround time are both unmatched.



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