



# MMO TUBULAR ANODES

PRODUCT DATA SHEET

# MMO TUBULAR ANODES

As the most common type of mixed metal oxide(MMO) anodes, our tubular anode is popular for use in all impressed current cathodic protection applications.

## QUALITY SUBSTRATE MATERIAL

Our MMO tubular anodes are manufactured from high-tensile titanium, which meets commercially ASTM B338 Grade I standards.

Element		Content (%)
Iron	(Fe)	0.20 max.
Carbon	(C)	0.08 max.
Nitrogen	(N)	0.03 max.
Hydrogen	(H)	0.015 max.
Oxygen	(O)	0.18 max.
Single Impurity	(Each)	0.10 max.
Other Impurities	(Total)	0.40 max.
Titanium	(Ti)	Remainder

## NOBEL METAL OXIDE COATING

Whether operating in soil, mud, fresh water or seawater, mixed metal oxide coatings demonstrate high chemical stability, even in environments with low pH values. Depend on the form of usage, the coatings can be mixed of two or more metal oxides such as iridium oxides ( $\text{IrO}_2$ ), tantalum oxides ( $\text{Ta}_2\text{O}_5$ ) and ruthenium oxides ( $\text{RuO}_2$ ).

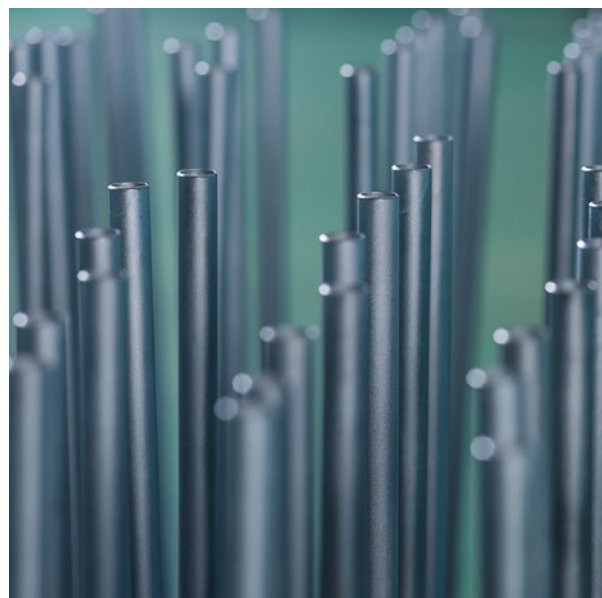
We can produce anodes with different nobel metal oxide ratios and differing coating thickness. Based upon accelerated life testing conducted by an independent laboratory, our MMO coating has been proven to be superior to other similar products in the market.

### ■ Ir-Ta Mixed Metal Oxide Catalyst

The iridium-tantalum mixed metal oxide catalyst is recommended for use in soil or fresh water, where there is either no chloride ions or low chloride ions present.

### ■ Ir-Ru Mixed Metal Oxide Catalyst

The iridium-ruthenium mixed metal oxide catalyst can be used in seawater, brackish water, mud, concrete and any other severe environment conditions including high acidity or in the presence of chlorine or oxygen.



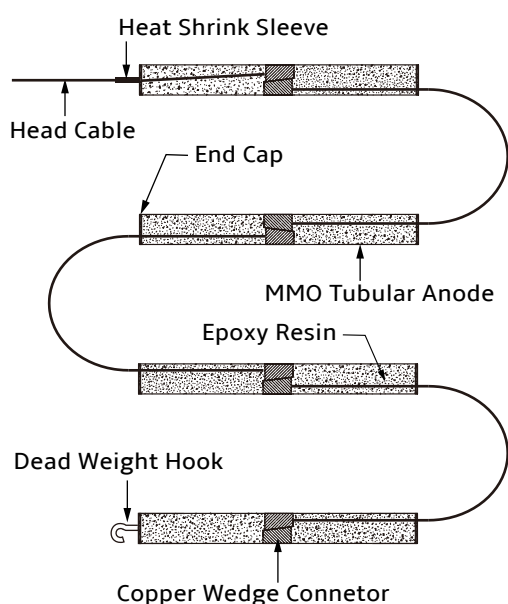
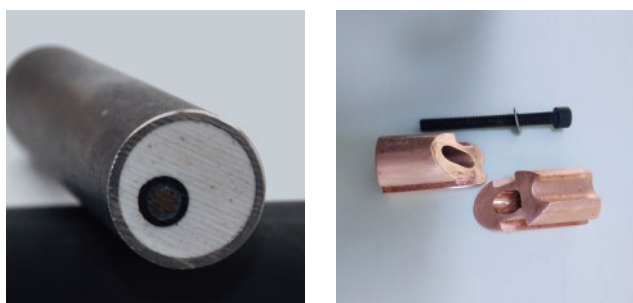
# MMO TUBULAR ANODES

## PRACTICAL APPLICATION

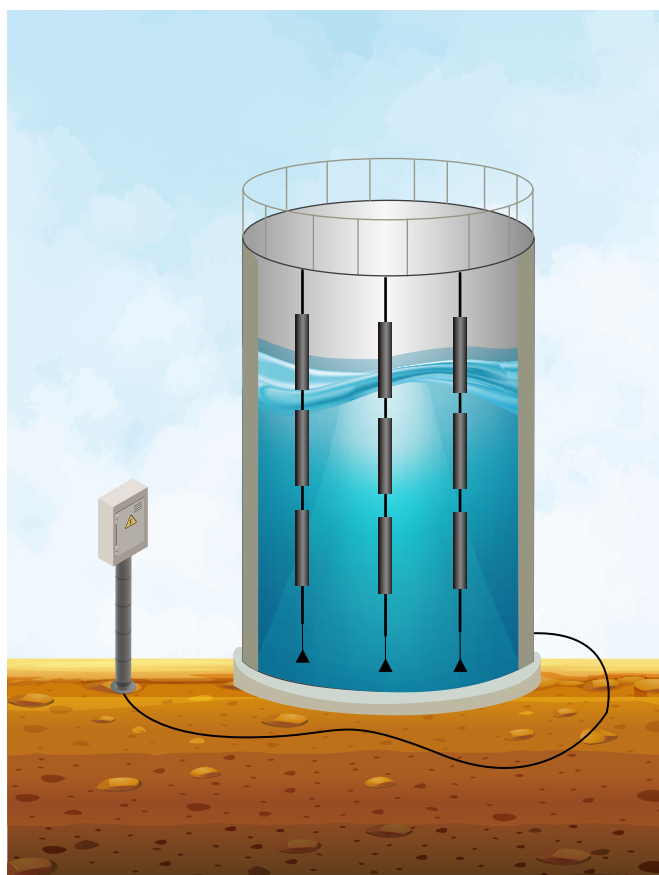
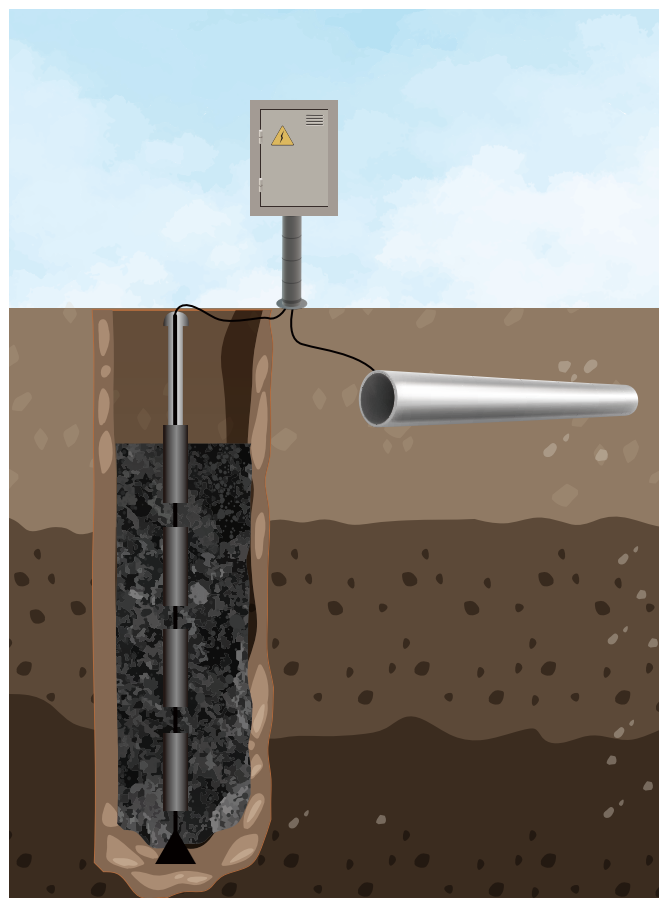
Our tubular anode is generally connected in strings with electrical cable by specialized pure copper connector. Normally, the anode string is preassembled in our factory and ready for installation on-site. All connections are encapsulated with good epoxy resin to create a waterproof seal.

It can not only be used for the cathodic protection of underground pipe or other steel structure in deep well or trench, but also be used for the corrosion control of internal storage tank walls.

We recommend dual-insulated cable (such as PVDF/ HMWPE) for use in ground bed with high level of chlorides. While HMWPE is an economical choice for shallow vertical and horizontal surface beds with no chlorides. Marine cable is ideal for seawater applications due to its high current capacity and flexibility.

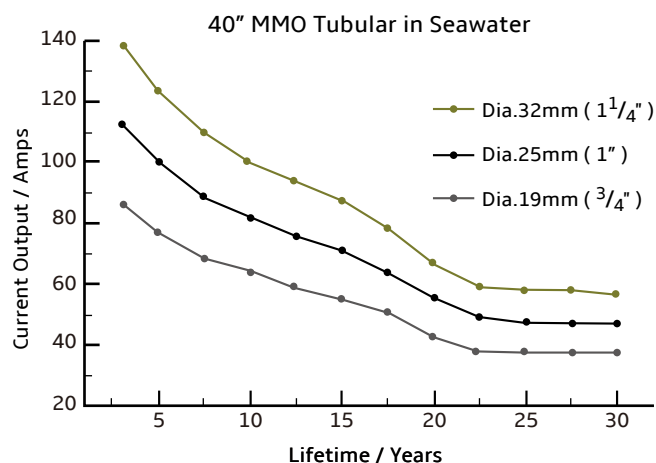
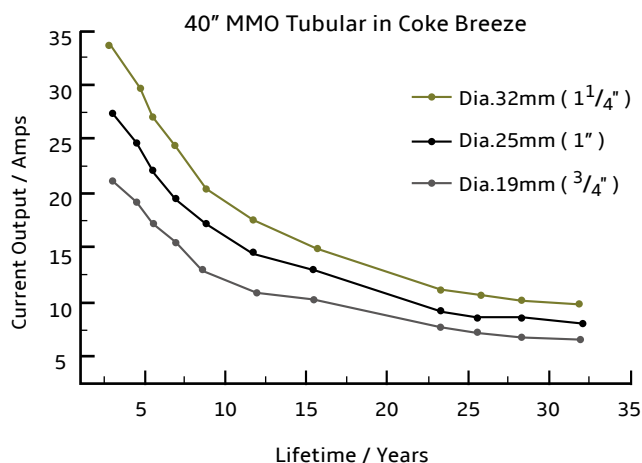


**Typical Anode String Assembly Illustration**



# MMO TUBULAR ANODES

## ELECTROCHEMICAL PROPERTIES



### In Soil / Coke Breeze / Freshwater

Anode Dimensions	Current Density	Current Output	Lifetime
Φ16 x 1000mm ( 5/8" x 39.4" )	100 A/m <sup>2</sup>	5.0 A	25 yrs.
Φ19 x 1000mm ( 3/4" x 39.4" )	100 A/m <sup>2</sup>	6.0 A	25 yrs.
Φ25 x 500mm ( 1" x 19.7" )	100 A/m <sup>2</sup>	4.0 A	25 yrs.
Φ25 x 1000mm ( 1" x 39.4" )	100 A/m <sup>2</sup>	8.0 A	25 yrs.
Φ25 x 1524mm ( 1" x 60.0" )	100 A/m <sup>2</sup>	12.0 A	25 yrs.
Φ32 x 1220mm ( 1 1/4" x 48.0" )	100 A/m <sup>2</sup>	12.0 A	25 yrs.
Φ50 x 1200mm ( 2" x 47.2" )	100 A/m <sup>2</sup>	19.0 A	25 yrs.

### In Seawater

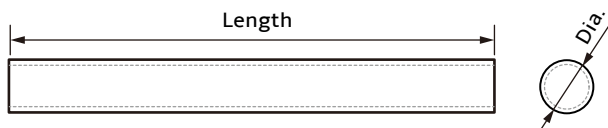
Anode Dimensions	Current Density	Current Output	Lifetime
Φ16 x 1000mm ( 5/8" x 39.4" )	600 A/m <sup>2</sup>	30.0 A	25 yrs.
Φ19 x 1000mm ( 3/4" x 39.4" )	600 A/m <sup>2</sup>	36.0 A	25 yrs.
Φ25 x 500mm ( 1" x 19.7" )	600 A/m <sup>2</sup>	24.0 A	25 yrs.
Φ25 x 1000mm ( 1" x 39.4" )	600 A/m <sup>2</sup>	48.0 A	25 yrs.
Φ25 x 1524mm ( 1" x 60.0" )	600 A/m <sup>2</sup>	72.0 A	25 yrs.
Φ32 x 1220mm ( 1 1/4" x 48.0" )	600 A/m <sup>2</sup>	72.0 A	25 yrs.
Φ50 x 1200mm ( 2" x 47.2" )	600 A/m <sup>2</sup>	114.0 A	25 yrs.



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## MMO TUBULAR ANODES

### SPECIFICATIONS



#### ■ Ir-Ta MMO Coating

Item No.	Diameter	Length	Lifetime
YX - MMO - CT160	16mm ( $\frac{5}{8}$ " )	1000mm (39.4")	25 yrs.
YX - MMO - CT190	19mm ( $\frac{3}{4}$ " )	1000mm (39.4")	25 yrs.
YX - MMO - CT250S	25mm (1" )	500mm (19.7")	25 yrs.
YX - MMO - CT250	25mm (1" )	1000mm (39.4")	25 yrs.
YX - MMO - CT250L	25mm (1" )	1524mm (60.0")	25 yrs.
YX - MMO - CT320	32mm ( $1\frac{1}{4}$ " )	1220mm (48.0")	25 yrs.
YX - MMO - CT500	50mm (2" )	1200mm (47.2")	25 yrs.

#### ■ Ir-Ru MMO Coating

Item No.	Diameter	Length	Lifetime
YX - MMO - ST160	16mm ( $\frac{5}{8}$ " )	1000mm (39.4")	25 yrs.
YX - MMO - ST190	19mm ( $\frac{3}{4}$ " )	1000mm (39.4")	25 yrs.
YX - MMO - ST250S	25mm (1" )	500mm (19.7")	25 yrs.
YX - MMO - ST250	25mm (1" )	1000mm (39.4")	25 yrs.
YX - MMO - ST250L	25mm (1" )	1524mm (60.0")	25 yrs.
YX - MMO - ST320	32mm ( $1\frac{1}{4}$ " )	1220mm (48.0")	25 yrs.
YX - MMO - ST500	50mm (2" )	1200mm (47.2")	25 yrs.



Note: All dimensions and weights shown above are nominal. The information provided is subject to change without notice.







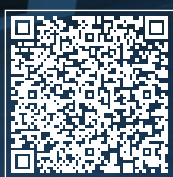
## Industrial Corrosion Control Solutions Provider

Established in 2003, YUXI has over a 20-year heritage of innovation in corrosion control science and technology. We're a spirited team of ambitious thinkers and pioneer sheep with a common goal in mind: protect our clients' assets from corrosion with cost-saving measures.

We have the most comprehensive catalog of cathodic protection materials including anodes, transformer rectifiers, backfills, coatings, etc. Our anodes and supplies are manufactured to strict quality standards through an ISO 9001 quality management system and are guaranteed to offer excellent performance in the industry.



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