



# COPPER CORED MMO WIRE ANODES



50 YEARS EXPERIENCE IN CATHODIC PROTECTION



JENNINGS ANODES



Jennings Anodes provides copper cored MMO wire anodes upon request. With electrical-conductive mixed metal oxide coating, the titanium wire is activated and functioned as anode. Copper cored MMO wire anodes has excellent performance characteristics with very little wear and dissolution of the metal oxide coating. A low consumption rate of the electrocatalytic layer operating at recommended current densities for CP applications enables a product lifetime of over 20 years in underground, brackish, seawater and concrete environments. Delivering a superior, reliable product to our clients for many years with a production capacity of 1,000,000 meters per year.

### ■ Quality Substrate Material

The high purity copper cored titanium wire has proven excellent chemical corrosion resistance, low electrical resistance, and high mechanical integrity against damage.

### ■ Noble Metal Oxide Coating

The coating film of the anode used depends on the operating environment. In soil or fresh water where there is either no chloride ions or low chloride ions present, therefore the Ir-Ta mixed metal oxide catalyst is recommended. For brackish and seawater, the Ir-Ru mixed metal oxide catalyst is recommended.

### ■ Low Coating Wear Rate

Stringent quality control procedures are followed throughout the coating process to ensure appropriate thickness and adhesion. Each batch is subject to thorough testing including accelerated life testing and coating thickness verification with X-ray among other tests.

### ■ Flexibility of Use

The lightweight and malleability of copper cored MMO wire anodes allow for adaptability in creating more complex configurations. They provide high conductivity, resulting in better current distribution along the entire length of the wire.

## APPLICATIONS

- Underground storage tanks
- Above ground storage tanks
- Ground beds
- Pipeline
- Electrical cable shielding
- Water treatment equipment



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## DATA SHEET

## ELECTROCHEMICAL PROPERTIES

The working life of the anode varies depending on the operating current present with the desired application.

### ■ In Soil

Wire Diameter	Current Rating		
	For 20 yrs.	For 30 yrs.	For 50 yrs.
0.06" (1.5 mm)	74 mA/ft. (240 mA/m)	49 mA/ft. (160 mA/m)	29 mA/ft. (96 mA/m)
0.12" (3.0 mm)	147 mA/ft. (480 mA/m)	98 mA/ft. (320 mA/m)	59 mA/ft. (192 mA/m)

### ■ In Freshwater / Coke Breeze

Wire Diameter	Current Rating		
	For 20 yrs.	For 30 yrs.	For 50 yrs.
0.06" (1.5 mm)	146 mA/ft. (480 mA/m)	97 mA/ft. (320 mA/m)	58 mA/ft. (192 mA/m)
0.12" (3.0 mm)	291 mA/ft. (960 mA/m)	194 mA/ft. (640 mA/m)	116 mA/ft. (384 mA/m)

### ■ In Brackish Water

Wire Diameter	Current Rating		
	For 20 yrs.	For 30 yrs.	For 50 yrs.
0.06" (1.5 mm)	438 mA/ft. (1440 mA/m)	292 mA/ft. (960 mA/m)	175 mA/ft. (576 mA/m)
0.12" (3.0 mm)	876 mA/ft. (2880 mA/m)	584 mA/ft. (1920 mA/m)	350 mA/ft. (1152 mA/m)

### ■ In Seawater

Wire Diameter	Current Rating		
	For 20 yrs.	For 30 yrs.	For 50 yrs.
0.06" (1.5 mm)	876 mA/ft. (2880 mA/m)	584 mA/ft. (1920 mA/m)	350 mA/ft. (1152 mA/m)
0.12" (3.0 mm)	1752 mA/ft. (5760 mA/m)	1168 mA/ft. (3840 mA/m)	701 mA/ft. (2304 mA/m)

## SPECIFICATIONS

Item No.	Wire Diameter	Coil Length	Weight
JA-MMO-CW1.5	0.06" (1.5 mm)	500 ft. (152 m)	2.75 lbs (1.25 kg)
JA-MMO-CW3.0	0.12" (3.0 mm)	500 ft. (152 m)	10.8 lbs (4.9 kg)



**Notes:** All dimensions and weights are nominal. The parameter provided is subject to variation in material compositions and Jennings Anodes foundry tolerance.

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## TESTING DETAILS

We employ ISO 9001:2015 quality management system and rigorous internal testing standards to ensure the optimum lifespan and performance of our anodes. Each anode is labelled with a unique serial number for quality tracking.

Technical Measurement	Chemical Composition	Electrochemical Performance	Physical Properties
Testing Standard	ASTM E120	NACE TM0108 / ASTM D3359	Foundry ITP
Testing Content	Substrate Analysis	Circuit Potential Current Efficiency	Dimension & Weight Coating Thickness
Equipment	Optical Emission Spectrometer OBLF QSN 750	JCM-6000 Plus Scanning Electron Microscope / DWW-K-100 Galvanostat / VCC101A Multimeter	Calibrated Digital Measuring Devices

\* Third party testing is conducted by customer's special request at extra charge.

## PACKAGING INFORMATION

We have strict packing protocols to guarantee safe delivery of our products. Clear shipping marks and documentation make delivery acceptance straightforward and simple.

Item No.	Coil Length	Coil Dimension	Weight	
			N.W.	G.W.
JA-MMO-CW1.5	500ft. (152m)	Φ 21" × 2.35" (Φ 530 × 60 mm)	2.75 lbs (1.25 kg)	3.4 lbs (1.55 kg)
JA-MMO-CW3.0	500ft. (152m)	Φ 21" × 3.15" (Φ 530 × 80 mm)	10.8 lbs (4.9 kg)	11.5 lbs (5.2 kg)





## Worldwide Service Network

Our worldwide network of sales and service centers can provide immediate advice and assistance on the complete range of products.

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