



MMO LINEAR ANODES (MADE IN USA)



CELEBRATED ENTERPRISE IN CATHODIC PROTECTION



MMO LINEAR ANODES

DATA SHEET

Our MMO linear anode is an ideal product for use when a low-current, evenly distributed cathodic protection system is needed.

It consists of a high grade titanium wire (coated in Ir-Ta mixed metal oxide) running in parallel with an insulated copper cable. The MMO wire/copper cable assembly is centrally packed in a porous non-woven fabric housing filled with conductive coke backfill.

■ High-grade Substrate Material

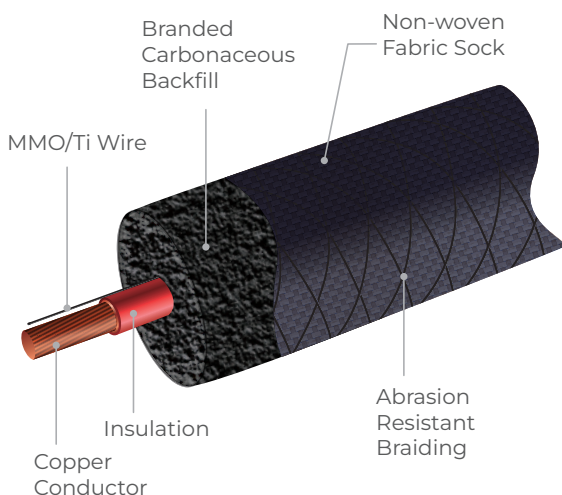
The core of the anode is composed of high-grade titanium wire, which meets ASTM B348 Grade I/II.

■ Ir-Ta Mixed Metal Oxide Coating

The Iridium-Tantalum mixed metal oxide catalyst demonstrate high chemical stability for use in soil or fresh water, where low chloride ions present.

■ Various Power Cable Options

The basic cable attached is #6 AWG stranded copper with high molecular weight polyethylene (HMWPE) insulation. It has the capacity to maintain the required current over considerable distance without incurring substantial longitudinal voltage drop. Other options can be made from Kynar/HMWPE, XLPE/PVC or as per specification.



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■ Premium Earth Contact Backfill

Utilizing branded backfill, our anode has superior performance for impressed current anode systems. The bulk density and high fixed carbon content coupled with the assured low resistivity medium allows for longer groundbed life at a lower operating cost.

- Fixed Carbon Content: 99.35%
- Ash: 0.6%
- Moisture: 0.05%
- Volatiles: Nil(950°C)
- Bulk Density: 74 lbs. / ft³

■ Braid Fabric Jacket

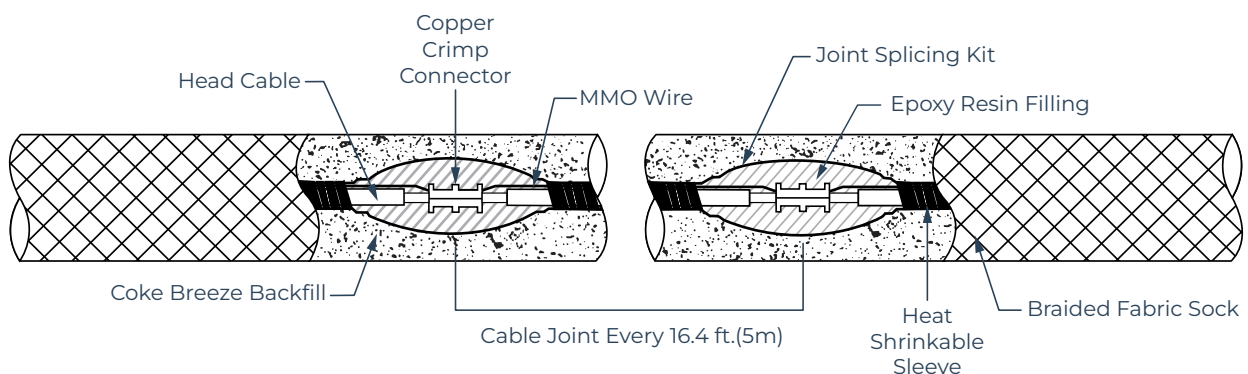
The fabric housing is braided using a high tensile strength heavy duty compact braid assuring product integrity.

■ Solid Joint Connection

The MMO titanium wire and power cable are crimped together via a heavy-duty copper connector to ensure low resistance.

The connection joint is then sealed in a splicing kit with epoxy resin and encapsulated in a heat shrink cap to ensure protection from water ingress — Helium Leak Test passed.

Connections are nominally made at 16.4 ft. (5m) intervals to ensure uniform current distribution along the length of the anode. Different connection intervals can be accommodated as required.



APPLICATIONS

Our MMO linear anode is an impressed current anode suited to underground environments. It can be easily field cut to appropriate lengths and/or it can be spliced to other MMO linear anode segments.

Normally, this MMO linear anode can be installed by laying it in a hand- or machine-dug trench or cable plowing, to provide an ICCP system to protect newly constructed structures, or to provide a cost-effective ICCP solution for existing structures.

- External surface of buried transmission pipelines
- Buried metal structures in confined or congested spaces
- External bottom of aboveground tanks



ELECTROCHEMICAL PROPERTIES

Technical Measurement	Testing Standard	Performance
Copper Cable Connection Resistance	ASTM B - 193	$3.08 \times 10^{-3} \Omega \cdot m$
MMO Wire Volume Resistivity	ASTM B - 193	9~11 m $\Omega \cdot cm$
Coke Backfill Resistivity	G.L.C.-C-12A, 10 bar (145psi) @23°C (73°F)	0.1 $\Omega \cdot cm$
Cable Joint Resistivity	ASTM B - 193	1.0 m Ω Max.

FABRIC JACKET PHYSICAL PROPERTIES

Technical Measurement	Testing Standard	Performance
Weight	80g/mv Min.	80 g/m ²
Bursting Strength	ISO 3303	500N Min.
Abrasion Resistance	ASTM D - 4157	100 Cycles to Failure
Fluid Resistance	6 months Immersion Test	PASS
Chlorine Resistance	6 months Immersion Test	PASS
UV Resistance	ASTM G-53: 8 hrs @60°C (140°F) 4 hrs condensation @50 °C (122°F)	55% Tear Strength Loss

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SPECIFICATIONS

■ MMO Linear Anode with Solid Titanium MMO Wire

Item No.	Solid Titanium MMO Wire	Cable Conductor	Sock Diameter	Length	Current Output	Design Life
JA-MMO-FLA25	Φ0.04" (Φ1.0 mm)	#6 AWG (HMWPE)	Φ1.5" (Φ38 mm)	500 / 1000 / 1500 ft. (152 / 305 / 457 m)	25 mA/ft. (82mA/m)	25 yrs.
JA-MMO-FLA100	Φ0.06" (Φ1.5 mm)	#6 AWG (HMWPE)	Φ1.5" (Φ38 mm)	500 / 1000 / 1500 ft. (152 / 305 / 457 m)	100 mA/ft. (328 mA/m)	25 yrs.
JA-MMO-FLA300	Φ0.12" (Φ3.0 mm)	#6 AWG (HMWPE)	Φ1.5" (Φ38 mm)	500 / 1000 / 1500 ft. (152 / 305 / 457 m)	300 mA/ft. (984 mA/m)	25 yrs.
JA-MMO-FLA400	Φ0.12" (Φ3.0 mm)	#6 AWG (HMWPE)	Φ1.5" (Φ38 mm)	500 / 1000 / 1500 ft. (152 / 305 / 457 m)	400 mA/ft. (1312 mA/m)	25 yrs.

■ MMO Linear Anode with Copper Cored Titanium MMO Wire

Item No.	Copper Cored MMO Wire	Cable Conductor	Sock Diameter	Length	Current Output	Design Life
JA-MMO-FLAC25	Φ0.04" (Φ1.0 mm)	#6 AWG (HMWPE)	Φ1.5" (Φ38 mm)	500 / 1000 / 1500 ft. (152 / 305 / 457 m)	25 mA/ft. (82mA/m)	25 yrs.
JA-MMO-FLAC100	Φ0.06" (Φ1.5 mm)	#6 AWG (HMWPE)	Φ1.5" (Φ38 mm)	500 / 1000 / 1500 ft. (152 / 305 / 457 m)	100 mA/ft. (328 mA/m)	25 yrs.
JA-MMO-FLAC300	Φ0.12" (Φ3.0 mm)	#6 AWG (HMWPE)	Φ1.5" (Φ38 mm)	500 / 1000 / 1500 ft. (152 / 305 / 457 m)	300 mA/ft. (984 mA/m)	25 yrs.
JA-MMO-FLAC400	Φ0.12" (Φ3.0 mm)	#6 AWG (HMWPE)	Φ1.5" (Φ38 mm)	500 / 1000 / 1500 ft. (152 / 305 / 457 m)	400 mA/ft. (1312 mA/m)	25 yrs.

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

PACKAGING INFORMATION

Our MMO linear anode is normally packed on lightweight wooden reel to ensure easy transportation and handling in the field. Steel reel can be supplied as required.

Anode Length (per reel)	Reel Dimensions (Dia. x D)	Weight		Reel Qty	
		N.W.	G.W.	20ft. container	40ft. container
500 ft. (152 m)	Φ36" x 32" (Φ914 x 812 mm)	473 lbs (215 kg)	540 lbs (245 kg)	24	48
1000 ft. (305 m)	Φ42" x 40" (Φ1067 x 1016 mm)	947 lbs (430 kg)	1036 lbs (470 kg)	/	/
1500 ft. (457 m)	Φ46" x 41" (Φ1168 x 1041 mm)	1421 lbs (645 kg)	1543 lbs (700 kg)	/	/



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