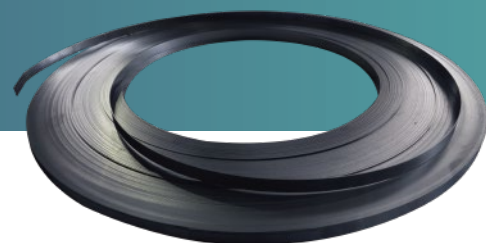




MIXED METAL OXIDE (MMO) RIBBON ANODES



50 YEARS EXPERIENCE IN CATHODIC PROTECTION



MMO RIBBON ANODES

DATA SHEET

Our MMO ribbon anode is manufactured using a bespoke automated production line which ensures meticulous titanium substrate preparation and a homogeneous coating application with superior adhesion properties. It can be used in sand with various levels of moisture and salt content without any carbon filling materials required.

■ Quality Substrate Material

The titanium substrate of the anode is selected according to ASTM B265 Grade I standard requirements.

■ Excellent Resistance in Acidic Medium

Ir-Ta catalyzed coating on the surface creates a low resistance for improved anode performance. They can be used in sand with various levels of moisture and salt content without any carbon filling materials required.

■ Dimensional Stability

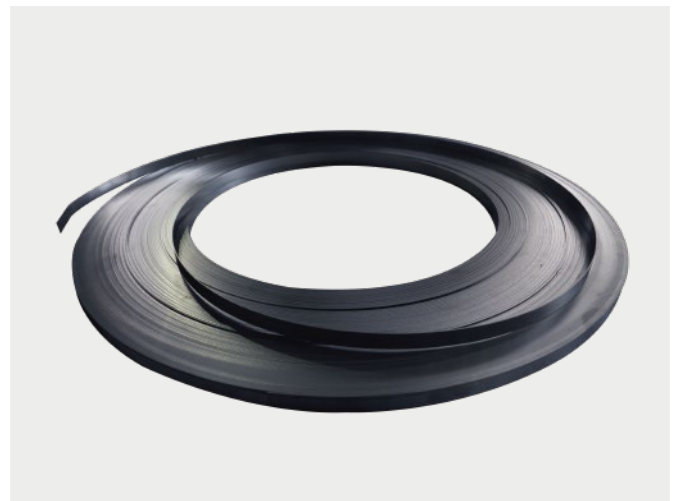
Because the titanium substrate is naturally passivated by an oxidizing film, this ribbon anode remains dimensionally stable over time.

Direct current transfer is accomplished through the mixed metal oxide catalyst which is highly conductive and fully oxidized, so that higher current outputs are achievable.

APPLICATIONS

Our MMO ribbon anode can be used for the ICCP system to protect the bottoms of both new and old large-scale storage tanks, as well as steel reinforced concrete structures on the ground.

- Newly constructed aboveground storage tank with secondary containment liners
- Existing aboveground tank utilizing double-bottom construction
- Buried pipelines



ELECTROCHEMICAL PROPERTIES

■ In Fine Sand

Item No.	Electrical Resistance	Current Density	Current Output			
			For 20 yrs.	For 30 yrs.	For 40 yrs.	For 50 yrs.
JA-MMO-R01	0.45 Ω /ft. (0.14 Ω /m)	0.278 A/ft ² (3.0 A/m ²)	32 mA/ft. (105 mA/m)	21 mA/ft. (70 mA/m)	16 mA/ft. (53 mA/m)	5.2 mA/ft. (17 mA/m)
JA-MMO-R02	0.021 Ω /ft. (0.07 Ω /m)		64 mA/ft. (210 mA/m)	43 mA/ft. (140 mA/m)	32 mA/ft. (105 mA/m)	25.6 mA/ft. (86 mA/m)

* JA-MMO-R01's higher current output of 12.8 mA/ft. (42 mA/m) for 50 years design life is available upon request.

■ In Concrete

Item No.	Electrical Resistance	Current Density	Current Output (For 100 yrs.)
JA-MMO-R01	0.45 Ω /ft. (0.14 Ω /m)	10.19 mA/ft ² (110 mA/m ²)	0.45 mA/ft. (1.5 mA/m)
JA-MMO-R02	0.021 Ω /ft. (0.07 Ω /m)		/

SPECIFICATIONS

Item No.	Width	Thickness	Cross Section	Surface Area	Coil Length	Weight
JA-MMO-R01	1/4" (6.3 mm)	0.025" (0.635 mm)	0.006" (4.03 mm ²)	0.014 m ² /m	500 ft. (152 m)	6.2 lbs (2.8 kg)
JA-MMO-R02	1/2" (12.7 mm)	0.025" (0.635 mm)	0.012" (8.06 mm ²)	0.027 m ² /m	500 ft. (152 m)	12.3 lbs (5.6 kg)

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

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 / NACE TM0294 / ASTM D3359	Foundry ITP
Testing Content	Chemical Analysis	Current Output Anode Life	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-R01	152m (500ft.)	15.5" × 15.5" × 1.0" (390 × 390 × 24 mm)	6.2 lbs (2.8 kg)	7.1 lbs (3.2 kg)
JA-MMO-R02	152m (500ft.)	/	12.3 lbs (5.6 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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