MIXED METAL OXIDE (MMO) MESH RIBBON ANODES

50 YEARS EXPERIENCE IN CATHODIC PROTECTION

JENNINGS ANODES

MMO MESH RIBBON ANODES

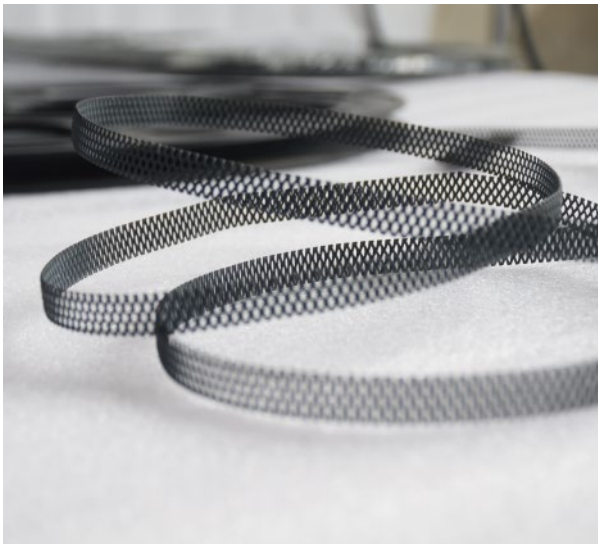
DATA SHEET

Composed of a precious metal oxide catalyst sintered onto an expanded titanium mesh substrate, MMO mesh in ribbon form is commonly used in concrete for the cathodic protection of steel rebar. It is generally field assembled with the titanium conductor bar and a resistance welder.

Quality Substrate Material

The titanium substrate is selected according to ASTM B265 Grade I standard requirements. The high purity titanium has proven excellent chemical corrosion resistance, low electrical resistance, and high mechanical integrity against damage.

Coefficient of Thermal Expansion	8.7×10^{-5} / K^{-1} (4.8×10^{-6} / in / in / °K)
Thermal Conductivity @ 20°C	15.6 W/m°K (9.0 BTU/hr·ft².°F)
Electrical Resistivity @ 20°C	56×10^{-6} Ω·cm (22×10^{-6} Ω·in)
Modules of Elasticity (Min.)	105 GPa (14,900,000 PSI)
Tensile Strength (Min.)	245 MPa (35,000 PSI)
Yield Strength (Min.)	175 MPa (25,000 PSI)
Elongation (Min.)	24%



Noble Metal Oxide Coating

The Ir–Ta mixed metal oxide catalyst, sintered to the surface of titanium substrate, demonstrates high chemical stability when exposed to high current density.

We are able to produce anodes with differing coating thickness and noble metal oxide ratios. Strict quality procedures are followed throughout the coating process to ensure appropriate coating thickness and adhesion.

Long Working Life

The MMO coating film on the titanium mesh creates a protective stable layer ensuring a low consumption of the anode. Our anode can have a life expectancy of 100 years based on a 10 mA/ft² (110 mA/m²) current density.

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APPLICATIONS

MMO mesh ribbon anodes are a key component for impressed current cathodic protection of new build reinforcement concrete structures and existing concrete structures.

- For new build structures, the mesh ribbon anode is simply attached onto the rebar embedded in concrete/mortar before the concrete is poured.
- For retrofit applications, the mesh ribbon anode can be inserted into slots cut into the concrete surface.

ELECTROCHEMICAL PROPERTIES

Item No.	Electrical Resistance	Current Density	Current Output		
			For 50 yrs.	For 75 yrs.	For 100 yrs.
JA–MMO–M1	0.15 Ω/ft. (0.5 Ω/m)	10 mA/ft² (110 mA/m²)	0.9 mA/ft. (3 mA/m)	0.85 mA/ft. (2.8 mA/m)	/
JA–MMO–M2	0.12 Ω/ft. (0.39 Ω/m)		1.1 mA/ft. (3.7 mA/m)	1.07 mA/ft. (3.5 mA/m)	/
JA–MMO–M3	0.08 Ω/ft. (0.25 Ω/m)		1.7 mA/ft. (5.6 mA/m)	1.6 mA/ft. (5.3 mA/m)	1.4 mA/ft. (4.7 mA/m)
JA–MMO–M4	0.06 Ω/ft. (0.19 Ω/m)		2.1 mA/ft. (7 mA/m)	/	1.8 mA/ft. (5.8 mA/m)
JA–MMO–M5	0.014 Ω/ft. (0.046 Ω/m)		/	7.6 mA/ft. (25 mA/m)	/

* The maximum current density for short term limit is 20 mA/ft² (220 mA/m²).

SPECIFICATIONS

Item No.	Width	Expanded Thickness	Diamond Dimensions	Surface Area	Coil Length	Weight
JA–MMO–M1	0.4" (10 mm)	0.05" (1.3 mm)	0.1"x0.2"x0.02" (2.5x4.6x0.6 mm)	0.027 ft²/ft (0.027 m²/m)	250 ft. (76m)	2.4 lbs (1.1 kg)
JA–MMO–M2	0.5" (12.7 mm)	0.05" (1.3 mm)	0.1"x0.2"x0.02" (2.5x4.6x0.6 mm)	0.032 ft²/ft (0.032 m²/m)	250 ft. (76m)	3.1 lbs (1.4 kg)
JA–MMO–M3	0.75" (19 mm)	0.05" (1.3 mm)	0.1"x0.2"x0.02" (2.5x4.6x0.6 mm)	0.048 ft²/ft (0.048 m²/m)	250 ft. (76m)	6.2 lbs (2.8 kg)
JA–MMO–M4	1" (25 mm)	0.05" (1.3 mm)	0.1"x0.2"x0.02" (2.5x4.6x0.6 mm)	/	250 ft. (76m)	7.9 lbs (3.6 kg)
JA–MMO–M5	48" (1220 mm)	0.08" (2.0 mm)	1.3"x3.0"x0.04" (34x76x0.89 mm)	0.22 ft²/ft (0.22 m²/m)	250 ft. (76m)	73 lbs (33 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.

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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