

## Impressed Current Cathodic Protection

Anodes / Mixed Metal Oxide (MMO) Tubular

PS 02.001

# Mixed Metal Oxide (MMO) Tubular

Hockway's Mixed Metal Oxide tubular anodes comprise of a titanium tube coated in a mixed metal oxide coating of iridium (IrO<sub>2</sub>) and Tantalum (Ta<sub>2</sub>O<sub>5</sub>).

The MMO coating shows a number of advantageous properties including:

- Excellent conductivity
- Resistance to acidic environments
- Chemical stability
- Relatively low consumption rates (approx 4 microgram/A.yr)
- Suitable for use in both chlorine and oxygen evolving electrolytes

The tubular anodes can be manufactured in various forms to suit the intended application

- Single cable tail
- Multiple anodes on a string
- Canistered

### Typical Applications

Horizontal Groundbeds

Deepwell / Open hole Groundbeds

Anode Strings

Internal Plant Protection

Offshore/Marine Structures

Seawater intakes



MMO Tubular Anode



Typical Galvanised Steel Canisters for use with tubular anode and carbonaceous backfill

### Chemical Composition

Substrate	Titanium (ASTM B348 Grade 1 or 2)
Coating	IrO <sub>2</sub> / Ta <sub>2</sub> O <sub>5</sub> )

### Operating Characteristics and Standard Dimensions

Environment	Anode Size	Current Output	Life
Coke, Calcined	25x500mm	4 amps	20 years
Potroleum	25x1000mm	8 amps	20 years
Backfill	32x1000mm	10 amps	20 years
	32x1224mm	12 amps	20 years
Sea Water	25x500mm	25 amps	20 years
	25x1000mm	50 amps	20 years
	32x1000mm	60 amps	20 years
	32x1224mm	75 amps	20 years

Current outputs adjusted for use in calcined petroleum coke breeze - 100A/M<sup>2</sup>

### Operating Characteristics

Environment	Maximum Current Density	Life
Carbonaceous Backfill	50 A/m <sup>2</sup>	20 years
Calcined Petroleum Backfill	100 A/m <sup>2</sup>	20 years
Fresh Water	100 A/m <sup>2</sup>	20 years
Brackish Water	100-300 A/m <sup>2</sup>	20 years
Sea Water	600 A/m <sup>2</sup>	20 years

### Optional Features

The following optional features can be provided for each MMO tubular anode:

#### Cabling

- As a single cable tail
- As a string of multiple anodes (sausage string)
- All cable centre connected then tested for resistance <0.001 ohms
- Cable connection types and sizes available on request

#### Canister

- Using spiral wound galvanized steel canisters
- Filled with petroleum coke or carbonaceous backfill
- Standard dimensions
- Other canister options available on request

### Contact

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