



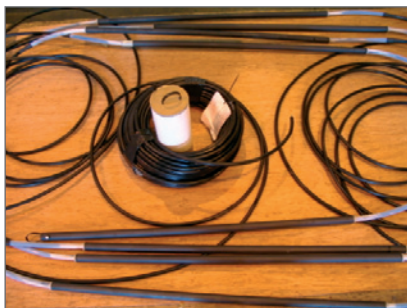
MIXED METAL OXIDE TUBULAR ANODES

REVISION 1

APPLICATION

Marine Structures, Seawater Intakes, Deepwell Groundbeds, Horizontal Groundbeds, Distributed Anodes, Tank Internals & Tank Bottoms Suitable For Use In Soils, Mud, Carbonaceous & Pet Coke Backfill; Fresh, Brackish and Sea Water

TUBULAR MMO ANODE DATA



Substrate	Titanium ASTM B338 Grade 1 or 2
Coating	$\text{IrO}_2/\text{Ta}_2\text{O}_5$
Coating Method	Multi pass thermal decomposition of precious metal salts technique
Diameter	25.4mm
Wall Thickness	0.90mm
Consumption Rate	0.5 - 4.0 mg/A/yr depending upon CP application conditions
Utilisation Factor	Dimensionally Stable
Working Environment	Suitable for Cl_2 & O_2 or combination of both

Operating Characteristics

Environment	Max Current Density (A/m ²)	Life (Years)
Carbonaceous Backfill	50	20
Calcined Petroleum Coke	100	20
Freshwater	100	20
Brackish Water	100-300	20
Seawater	600	20

Coating loading can be adjusted for specific lifetime/current density requirement

Cable Types	HMWPE/PVDF(Kynar); XLPE/PVC/SWA/PVC; EPR/CSPE Maximum 1Cx50mm ²
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Anode/Cable Connection	Centre connection less than 0.001 Ohm, resin encapsulated & helium tested to prove effective seal
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STANDARD ANODE TYPES, DIMENSIONS AND OUTPUTS

Type	OD		Length		Current Output (Typical)	Current Output (Typical)
	mm	inches	mm	inches	(Amps from 5-70°C)	(Amps from 0-5°C)
Soil (with carbon backfill)						
S-2.5/50	25	1	500	19.7	4	2
S-2.5/100	25	1	1000	39.4	8	4
Fresh Water						
FW-2.5/50	25	1	500	19.7	4	2
FW-2.5/100	25	1	1000	39.4	8	4
Sea Water						
SW-2.5/50	25	1	500	19.7	25	5
SW-2.5/100	25	1	1000	39.4	50	10
Mud (*)						
M-2.5/50	25	1	500	19.7	2 - 4	1.5
M-2.5/100	25	1	1000	39.4	4 - 8	3
Brackish Water (**)					(Amps from 10-70°C)	(Amps from 0-10°C)
BW-2.5/50	25	1	500	19.7	4÷12	2÷6
BW-2.5/100	25	1	1000	39.4	8÷24	4÷12

(*) Current outputs in mud depend on site conditions (sea mud or river mud, etc)

(**) Current outputs in brackish water depend on site conditions & chloride concentrations.

NOTES

- Coating loading may be adjusted to suit a particular current density or design life
- Standard anodes are designed for 20 year life, however, design life of up to 50 years can be catered for.
- Tubular MMO anode strings can be supplied to Clients specific requirements.
- Other tube diameters are available on request, 16mm dia & 32mm dia.