

Mixed Metal Oxide Tubular Anodes

APPLICATION

Marine structures, seawater intakes, deep well ground beds, horizontal ground beds, distributed anodes, tank internals & tank bottoms. Suitable for use in soils, mud, carbonaceous & petroleum coke backfill; fresh, brackish and seawater.



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 - 4.0mg/A/year depending upon CP application conditions
Utilisation factor:	Dimensionally stable
Working environment:	Suitable for Cl_2 & O_2 or combination of both
Cable types:	XLPE/PVC; XLPE/PVC/SWA/PVC; PVDF/HMWPE (Kynar/HMWPE); EPR/CSP; EPR/PCP Maximum: single core 50mm ²

OPERATING CHARACTERISTICS

Environment	Max Current Density (A/m ²)	Life (Years)
Carbonaceous backfill	50	30
Calcined petroleum coke	100	30
Freshwater	100	30
Brackish water	100-300	30
Seawater	600	30

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

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STANDARD ANODE TYPES, DIMENSIONS AND OUTPUTS

Type	OD		Length		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	4
SW-2.5/100	25	1	1000	39.4	50	8
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 30 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 & 32mm diameter