



Internal ICCP Anode Data Sheet

pml manufacture a range of MMO and platinised titanium anodes designed for use in internal impressed current cathodic protection systems



These anodes are designed for use in pressure vessels, power station cooling water systems, condenser water boxes, and other water processing equipment where high temperatures and pressures may exist.

The anodes are normally provided with a solid titanium substrate although niobium may be used dependant upon the application and operating voltage.

The anodes are able to operate in temperatures up to 175°C, and to perform well in chloride environments.

Anodes are normally constructed from 12mm dia rod with a domed end and operating length determined by the required current output. The anode is covered with 75mm long heatshrink tubing close to the fitting to provide electrical separation between the anode and the structure. The assembly is typically completed in a 1" BSP parallel thread zinc passivated mild steel mount or uPVC body. The assembly can be provided with a suitable terminal box and cable gland as required.

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The current ratings and life for the anodes are determined by the operating current density, the exposed surface area, the thickness of platinum coating and the resistivity of the electrolyte.

Anode materials	Consumption rate (g/Ay)	Maximum current density (A/m ²)	Maximum voltage (V)
Platinised Titanium	0,004 to 0,0012 ^{a)}	500 to 3000	g ^{b)}
Platinised Niobium	0,004 to 0,0012 ^{a)}	500 to 3000	50
Platinised Tantalum	0,004 to 0,0012 ^{a)}	500 to 3000	100
Mixed Metal Oxide	0,0006 to 0,006	400 to 1000	g ^{b)}

a) The life of the platinum film may be affected by the electrolyte resistivity, the consumption rate increasing with resistivity. The life of the platinum film can also be affected by the magnitude and frequency of the ripple present in the DC supply. Ripples frequencies less than 100 Hz should be avoided.

b) In sea water, the oxide film on titanium may break down if the voltage at the anode exceeds 8V vs Ag/AgCl/sea water. Higher voltages may be used with fully platinised anodes or in less saline environments.

For 12mm diameter rods operating at 530 A/m², the current ratings in seawater are as follows

Exposed length of anode (mm)	Anode current (amps)
25	0.5
50	1.0
75	1.5
100	2.0
125	2.5
150	3.0

If anodes are operating in electrolytes other than seawater, please contact us, as the current ratings and design life reduce with increasing resistivity.

Zinc and silver/silver chloride/seawater reference electrodes for monitoring and/or control can also be provided in the same style housing as the anodes as indicated on right of the second picture. For details contact us.

Customised anode designs and mounting arrangements to customer specifications can usually be accommodated. For details contact us.

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