

Anodes

When your boat's hull is submerged, anodes protect the various metal components (steel or aluminium hull, propeller shaft, keel, rudder, engine) from the deterioration caused by galvanic corrosion.

Galvanic corrosion (also called electrolyte) is the deterioration of metal which occurs when dissimilar metals are joined together by a conductor in an electrically conductive fluid : the least noble metal (the anode) dissolves while the most noble metal (the cathode) remains protected.

Sacrificial anodes are mounted on, or related to the metal to be protected. As the anode has a lower electrical potential than the metal, the anode deteriorates in lieu of the metal to be preserved.



Sea water : Zinc* or Aluminium
Brackish water : Aluminium
Fresh water : Magnesium

* Zinc anodes comply with MIL-A-18001K.

Electrochemical specifications	ZINC	ALUMINIUM	MAGNESIUM
Potential (Ag/AgCl)	- 1050 mV	- 1150 mV	1450 mV
Theoretical capacity	800 Ah/Kg	2700 Ah/Kg	1300 Ah/Kg
Practical capacity	780 Ah/Kg	2600 Ah/Kg	1300 Ah/Kg
Electrical efficiency	95%	90%	50%

Electrical potential of metals (Ag/AgCl)

Bronze	- 400 mV
Steel	- 800 mV
Stainless steel	- 200 -400 mVw
Brass	550 mV
Aluminium	- 800 -1100 mV

Standard anodes protect elements common to all boats (shafts, hull...).

Some anode models are specific to a motor or thruster brand (always refer to the manufacturer's recommendations).

INSTALLATION

The anode must be in direct contact with the metal it protects : never paint around an anode or the anode itself.

Do not fit magnesium anodes on wooden hulls as it would deteriorate the boat structure.

WHEN SHOULD ANODES BE REPLACED ?

Anodes deterioration rate may fluctuate according to the mooring area, water salinity, PH and temperature, potential electrical failure on board, and of course, the quality of the anodes themselves.

A good benchmark for replacement is when the anode is 70-80 % dissolved. It is recommended to replace anodes every year when doing the boat antifouling/launching. In all cases, anodes deterioration should always be watched carefully together with the condition of the metal parts they protect.

IMPORTANT :

On the opposite, anodes may dissolve quickly if they are bad quality or if there is an electrical failure on board (check the batteries, the right earth connection to the dock, the proper cathodic protection of your marina neighbours, ...).