



What is Marine Growth?

Ships are dependent on the seawater upon which they travel for a variety of reasons. One primary function seawater serves is to cool the engine and parts of the ship while it's operating. The used seawater is then discharge back into the sea and new seawater taken in, forming a continuous flow of exchange of saline water between the ship and its surrounding aqueous environment. Despite its benefits, the downside of this is that seawater contains marine organisms (both macro and micro), some visible to the naked eye while most are not. As the seawater passes through the various pipes and parts of the ship's engine, marine organisms are deposited along their surface. Over time, the deposit builds up, reducing the efficiency of the ship's engine and in severe cases, choking the entire system of the ship's engine which could eventually lead to malfunction of the entire ship's engine.

Consequences of Marine Growth and Marine Fouling

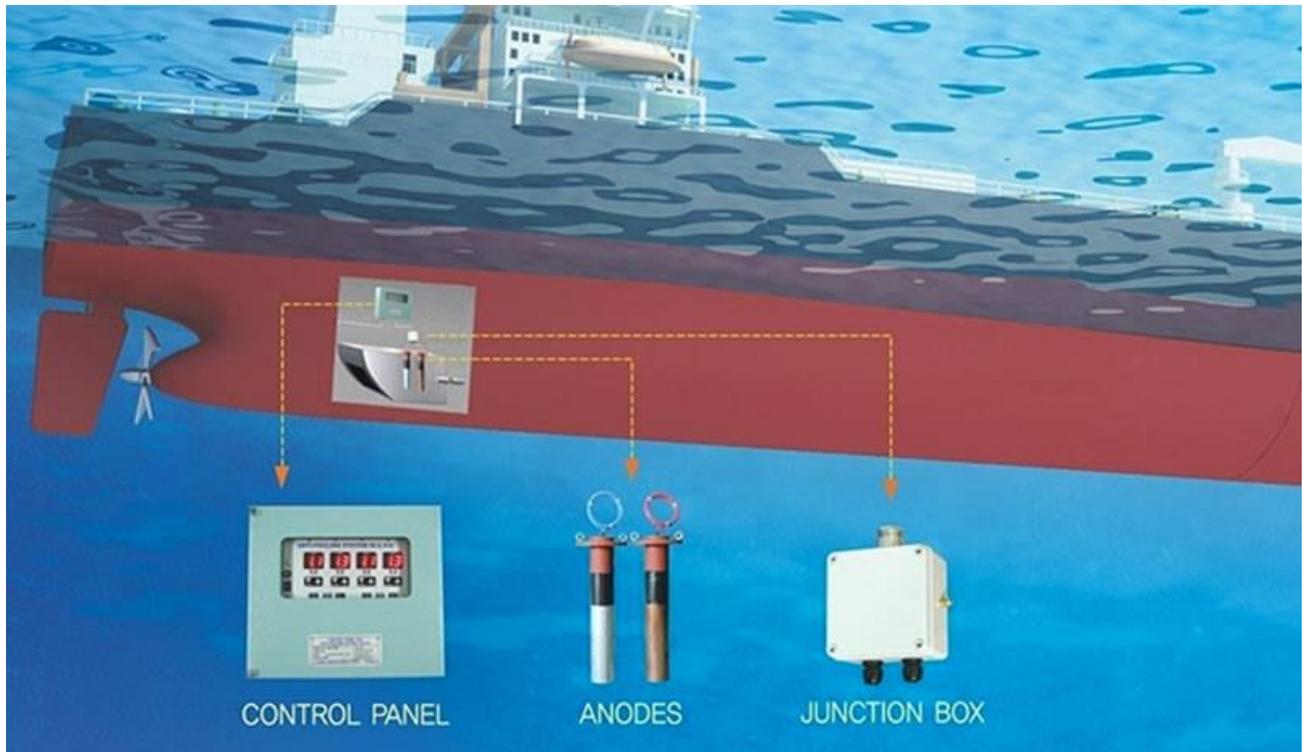


As the marine organisms flourish they block and narrow the passage of cooling water in the ship's system resulting in the following factors:

- Impairing the heat transfer system
- Overheating of several water-cooled machineries
- Increase in the rate of corrosion and thinning of pipes
- Reduced efficiency which can lead to loss of vessel speed and loss of time

MGPS, the solution.

Fortunately, the Marine Growth Prevention System (MGPS) was conceptualised and created with the sole purpose of defeating Marine Growth right at its very root, preventing even the most minute trace of marine organism from depositing itself along the ship's interior altogether.



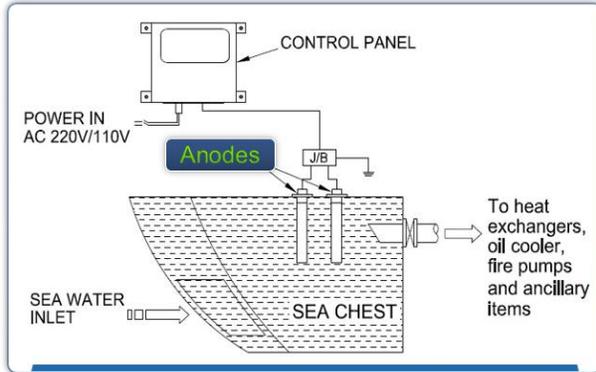
The system consists of a **CONTROL UNIT** which supplies impressed current to Anodes. The **COPPER** anode produces ions, which are carried away by the sea water into the piping and machinery system. Concentration of copper in the solution is less than 2 parts per billion but enough to prevent marine life from settling. Basic principle on which MGPS runs is electrolysis. The process involves usage of **Copper, Aluminum and Ferrous Anodes**.

The ions, spread over the system and produce an anti-fouling and anti corrosive film over the **Sea Water Pipelines, Intercoolers, Condensers, Heat Exchangers, Valves, Refrigeration Systems, Box Coolers** and **AC units** internally. Increasing seawater circulation and eliminating corrosion in the pipelines, increasing its duration and efficiency. That means energy savings

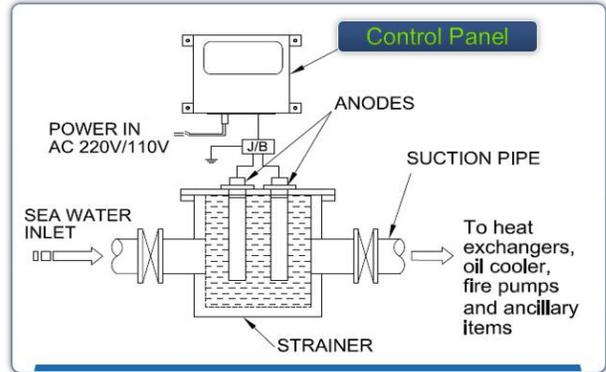
Our Anti-fouling System is designed for our worldwide clients with the following features.

- Capable of auto current change acc to 2 or 3 step flow operation
- Touch screen controller is applicable
- Low installation/maintenance costs and Safe
- Environment-friendly with normal 2ppb (parts per billion) dosing rate of copper ion
- Very convenient operation on easy and sophisticated controller
- Data communication and alarm signal can be connected to ship's AMS
- Simple installation to all kinds of new building as well as retrofitting ships

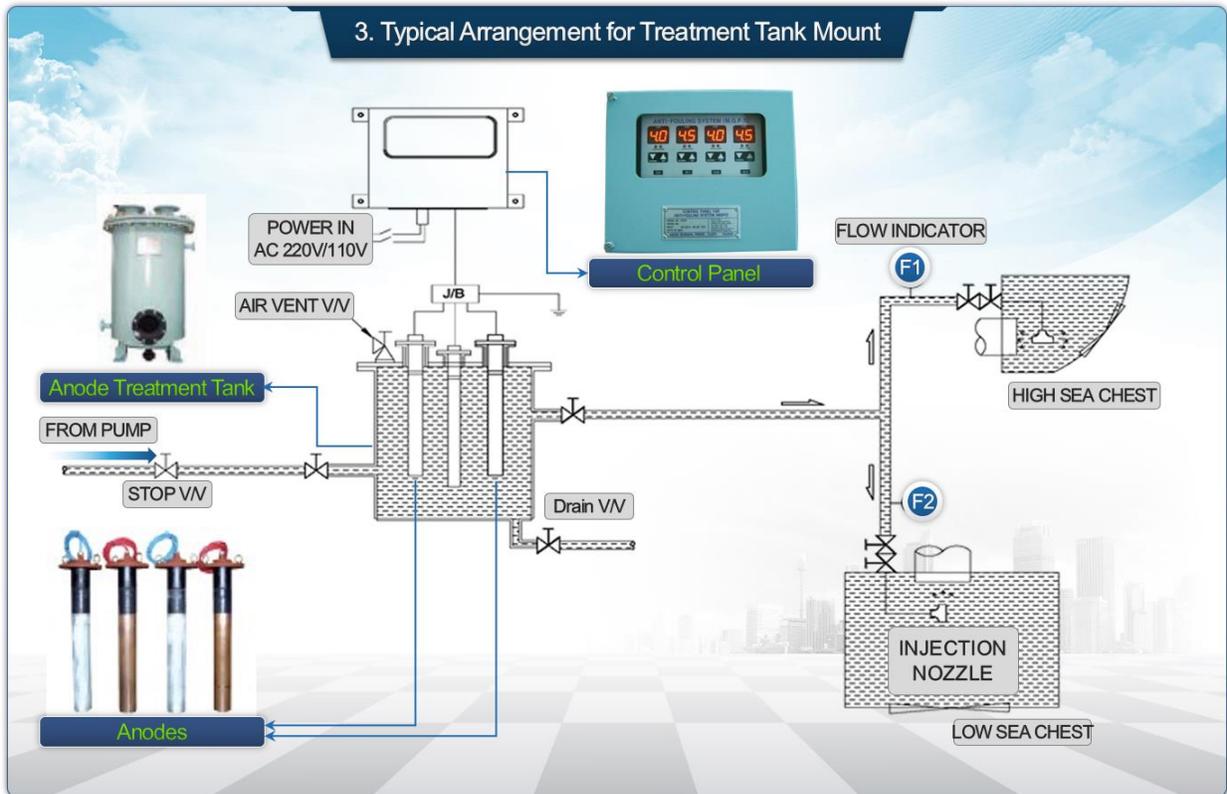
1. Typical Arrangement for Sea chest Mount



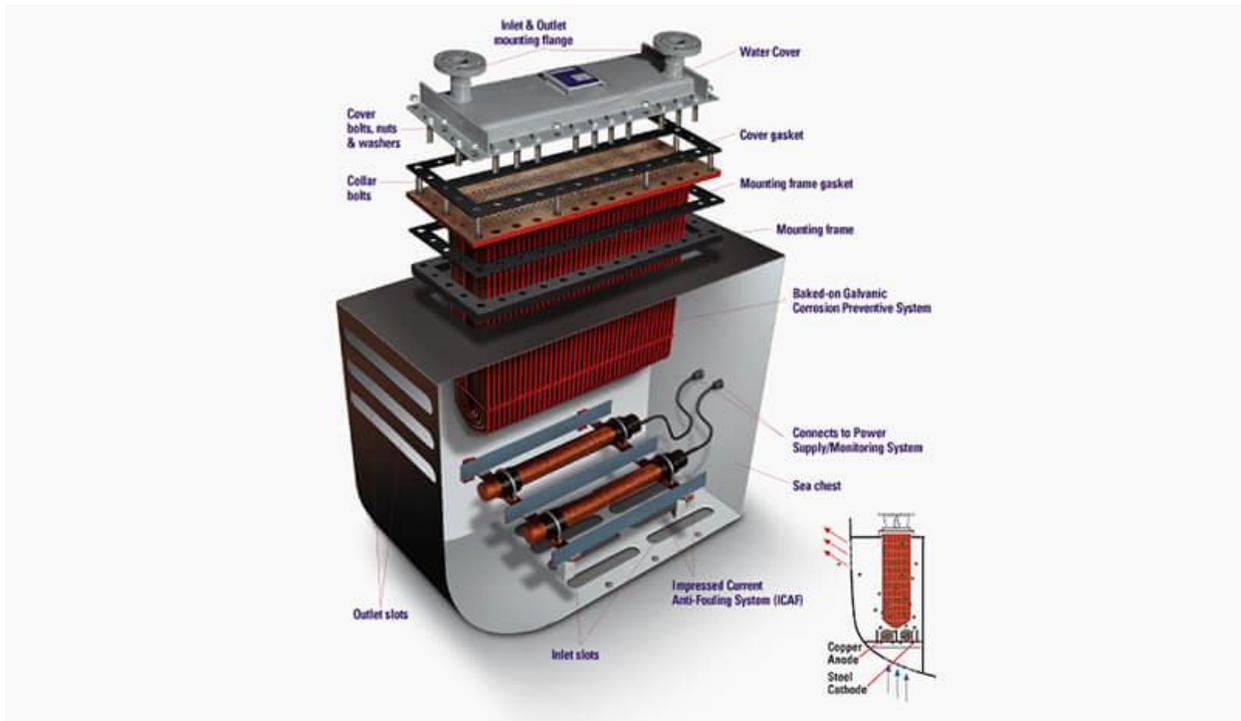
2. Typical Arrangement for Strainer Mount



3. Typical Arrangement for Treatment Tank Mount



Box Cooler Anodes



With the MGPS system in place, you can always rest easy, knowing your vessel's Sea Water pipeline interiors are well protected.

