

ANFOMATIC[®]

Introduction

Unpurified water cooling and firewater systems are critically dependent on freedom from blockages due to bio-fouling. For example marine fouling can take the form of growths ranging from fungi and bacteria to simple plants and animals adhering to the pipe walls as larvae before developing into adult forms which, if unchecked, can result in partial or complete blockage of the sea water piping.

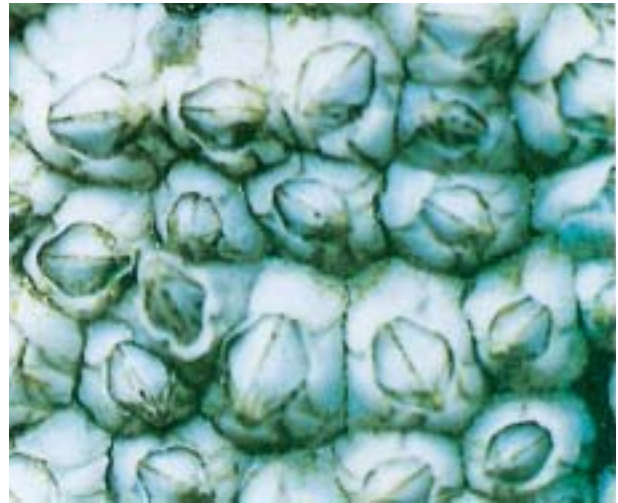
Such fouling results in inefficient operation and expensive downtime and is directly responsible for enhanced corrosion of piping, heat-exchangers and other items of process plant because of impingement/erosion and pitting and crevice corrosion due to differential aeration.



Intake screens for large industrial sea water cooling system

Corrpro has a worldwide reputation as a leading manufacturer of equipment and systems for cathodic protection of industrial plant and pipelines and leads in the design and manufacture of protection equipment for the marine and offshore industries.

The **Anfomatic**[®] electrolytic anti-fouling system is well established for use in shipboard sea water circulating systems. The principal of electrolytic anti-fouling is also widely recognised for industrial and offshore applications by leading North Sea, Arabian Gulf and American operators. It offers an alternative to the high capital, operating and maintenance costs of chemical dosing and the toxicity and safety hazards associated with chlorine treatment. **Anfomatic**[®] anti-fouling offers significant advantages for raw or sea water pumping and circulating systems.



Typical acorn barnacle (ballanus species)

Description

The **Anfomatic**[®] system employs the well established impressed current method to selectively dissolve both copper and aluminium or soft iron based anodes. These anodes are arranged in a steel frame or placed in a reaction vessel.

They should be positioned as near as possible to the inlet to the intake structure. Alternatively, depending on the pump sizes, the anodes can be arranged in a cylindrical steel framework mounted coaxially in the stilling tube of the pump. The anode assembly is cabled back to a remote power control unit through junction boxes as appropriate.

The **Anfomatic**[®] system discharges cupric ions into the water. They prevent settlement of organisms and the development of fouling. Additionally, the dissolved aluminium forms a hydroxide 'floc' which is carried through the system. Aluminium ions are incorporated into surface films, modifying them into a stable and protective form, thus mitigating the corrosion process in ferrous sea water systems. Where non-ferrous material is used, soft iron anodes are specified to mitigate corrosion.

The concentration of copper required to prevent adhesion and growth of micro-organisms is relatively minute (parts per billion). It is controlled by the output from the power unit which can also be interlocked with the main pump controller. When the pumps are not operating the power unit will maintain a pre-calculated output necessary to maintain the lower levels of copper dosage required. When pumping commences, the controller will boost the dosage rate to levels commensurate with the water flow rate.



ANFOMATIC®

Applications

The Anfomatic® anti-fouling system is ideally suited for sea water, brackish or fresh water circulating systems on ...

- sea water intakes at coastal facilities
- fixed production platforms
- semi-submersibles and jack-ups
- drill ships and floating storage units
- ships of all classes
- power stations and chemical plants

Features and benefits

- fouling prevention and corrosion mitigation are combined in one installation
- the system is automatic and maintenance – free in operation
- all types of hard fouling are prevented
- installation costs are very low; running costs are low
- pre-defined electrode lifetimes coincide with major maintenance shut-downs
- variable output can be provided to meet changing conditions (temperature, salinity, the tidal state, etc)
- uses state-of-the-art control equipment
- the system is non-polluting and environmentally acceptable since both copper and aluminium are naturally occurring elements

Services

Corrpro offers a complete design service for the Anfomatic® system and will supply all necessary equipment including anode assembly, cables, power unit, junction boxes and other accessories. Experienced engineers are available to supervise the installation and commissioning of each system, which is usually straightforward enough to be handled by a site contractor.



Reaction vessel, metering and monitoring equipment for treatment of 3,600m³/hr sea water offshore Brazil



Barnacle embryo (highly magnified)

Design Data

Each Anfomatic® system can be custom designed and the following information is required to allow Corrpro to tailor the equipment for the specific application.

- water analysis and conductivity, temperature range, fouling history
- detailed arrangement of the intake structure
- total water flow rate and number of pumps
- individual pump capacities
- pump utilisation periods (hours run per year)
- power supply details - voltage, phases, frequency
- hazardous area details (where applicable)
- power unit location relative to the intake
- pipework/flow diagram
- pump drawing showing basic dimensions and depth plus pump bowl intake details



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