evoqua
WATER TECHNOLOGIES

CHLOROPAC® MARINE GROWTH PREVENTION SYSTEMS

SAFETY FIRST. NO HAZARDOUS CHEMICALS REQUIRED

Chloropac® systems produce, insitu, a dilute, safe solution of sodium hypochlorite for direct injection into the water circuit for marine growth prevention. Our advanced electrolyzer technology, available in a choice of basic cell designs — coupled with our long standing expertise in anode and system development — has freed thousands of customers worldwide from the cost of purchasing and the danger of handling harsh chemicals associated with other technologies.

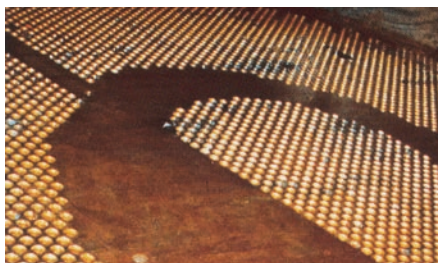
For seawater-based processes, the cost of fouling can be substantial. Macro-fouling from mussels, clams, oysters, sea anemones and barnacles, combined with micro fouling from bacteria, slime and algae, greatly restricts the flow of cooling water to heat exchanger surfaces, accelerates localized corrosion by restricting oxygen diffusion, and causes destructive turbulence at inlets. This can severely shorten the life of affected equipment.

Chlorination is well-known to be the most reliable solution for treating biologically fouled seawater, however the manual use and bulk storage of chlorine is generally an unacceptable safety hazard on land or on water.

CHLOROPAC SYSTEMS ARE THE NUMBER ONE CHOICE:

- Over 40 years operational experience with over 3,000 installations world wide
- Configured standard systems with output capacities from 50 grams/hr up to 500 Kg/hr +
- Compact space and weight
- Strategically located service staff and spares available worldwide, 24 hours a day
- Electrochlorination services can maintain, retrofit, refurbish or replace

Before Chloropac system



After Chloropac system

CHLOROPAC® SYSTEMS: INDUSTRY LEADING SERVICE AND SUPPORT

Industry		Application			
		Seawater Cooling	Seawater Lift Pumps	Seawater Injection	Regasification Pumps
Oil & Gas	Offshore Platforms	X	X	X	
	FPSO	X	X	X	
	FLNG/ FSRU	X	X		X
Marine Vessels	Naval Vessels, Ferries and Commercial Ships, LNG Vessels, Tankers, Bulk Carriers and Other Carrier Vessels	X			
Refineries and Petrochemical plants		X			
Power Plants		X			
Desalination plants		X			
Other users of sea-water as cooling or process water	e.g Chemical plants, Mineral Mills	X			

LATEST CHLOROPAC SYSTEMS DELIVER HIGHER EFFICIENCY AND REDUCED SPACE

SAFETY

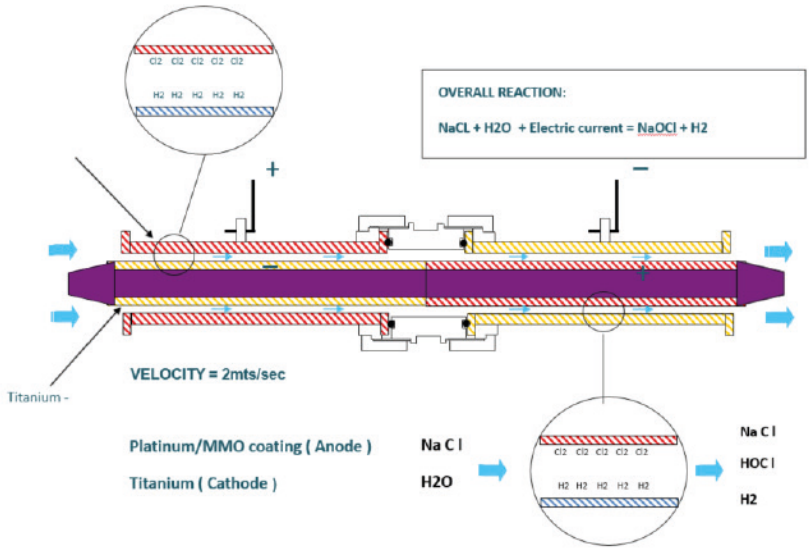
- Generation is on site so no storage, handling or movement of hazardous chemicals
- Degas ensures safe hydrogen removal
- IP44 and IP56 (ATEX & IECeX versions) electrical enclosures with easy access

SMALL FLEXIBLE SKID

- Reduced footprint
- Containerised system
- Easy ingress for offshore and marine applications
- Larger capacities gained through flexible building block concept

CHLOROPAC® SYSTEMS: PATENTED CTE TECHNOLOGY AT THE CORE

Seawater flows through the annulus created by the concentric titanium tubes that make up the anode and cathode assembly. Passing electric current through the seawater converts the sodium chloride into sodium hypochlorite: the active ingredient required for antifouling.



Multiple tubes (anodes and cathodes) within one cell mean increases sodium hypochlorite from a single cell.

- *Patented chloropac technology
- Efficiently produces sodium hypochlorite from seawater with the fewest cells possible.
- Self cleaning capability reduces maintenance costs
- Individual Concentric Tube Electrolyser cells easily removed and replaced
- Reduced leak paths

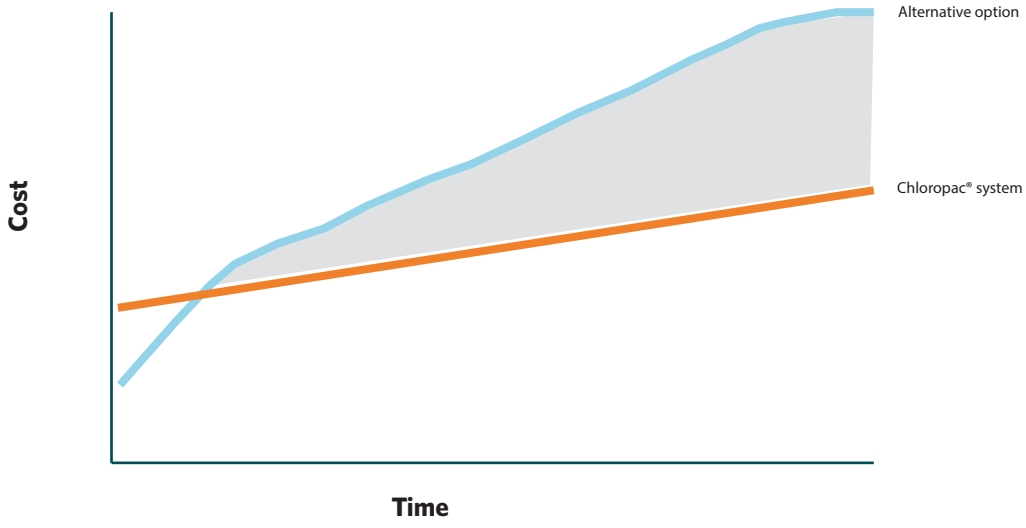
The “self-cleaning” Chloropac CTE system does not require down time for acid wash, or external electrode cleaning methods. This allows system users to operate at design output capacity at all times, providing the lowest lifecycle cost of any system. Standard designs are available for a wide range of chloride ion concentrations.

CHLOROPAC CTE SYSTEM ADVANTAGES:

- Compact, modular design
- Low maintenance
- High reliability and availability
- Full output availability —no cleaning required.
- Refurbishment available
- Environmentally safe

* Patented in some countries

LIFETIME COST CONSIDERATION



Castlegate Business Park, Caldicot, NP26 5AD, UK

Tel: +44 (0) 300 124 0500 Email: marine@evoqua.com www.evoqua.com/chloropac