



EPSCO

SETTING STANDARDS
IN WATER QUALITY

**Removing 100% of macrofouling
and microfouling from internal
pipework and seawater cooling
systems**

Two stage chemical treatment to remove hard fouling (shell and scaling) and soft fouling (organics), to achieve biosecurity and increased operational efficiency

Pictures taken 30 hours apart



BIOSECURITY and OPERATIONAL EFFICIENCY

CONSEQUENCES

- Damage to environment
- Restricted operations
- Increased operational costs
- Increased maintenance costs

TODAY'S PROBLEMS

How do we guarantee biosecurity within pipework and seawater cooling systems?

There are sever limitations with applying current cleaning methods to remove macro fouling in pipework and associated areas, both in terms of practical operation (access, time) and effectiveness.

Biosecurity risk remains uncontrolled and associated loss of cooling efficiency due to macro fouling is unresolved. Where strict requirements are in place for biosecurity control, and documented minimum cooling efficiency (intermediate or full class survey), the only available option is replacing pipework and coolers (expensive and time consuming).

Have you performed your duty when macrofouling remains in pipework and cooling systems?

EPSCO SOLUTION - TWO STAGE CHEMICAL TREATMENT

1

REMOVAL OF HARD DEPOSITS

Dissolve hard calcified shell macrofouling (molluscs / crustaceans), formulated 100% effective against mature BLUE MUSSELS - (*Mytilus edulis*) while simultaneously removing scale deposition within heat exchangers.

2

REMOVAL OF SOFT DEPOSITS

Destroy non-calcified organics (larvae, spats and planktonics for the main mollusks/crustaceans) and traditional soft macro and micro-fouling (algae, slimes, biofilms, seaweeds, hydroids).

Effective treatment must be able to remove both types of fouling in order to guarantee that all inorganic and organic deposits are removed from the system, and do not block associated assets, such as plate heaters with channels down to 2mm in size.

All chemical solutions can be discharged to sea and are engineered in accordance with the client's discharge requirements.

RESULTS – two stage treatment of seawater cooling loop – 30 hours start to finish

OPERATION

1. Initial visit and condition survey.
2. Selection of chemistry and application method; lab assessment of deposit type, materials of construction, discharge requirements, verification.
3. Execution of work in line with lab assessment and on-site practical logistics.
4. Verification; 3rd party inspection, reporting, performance data.

CASE: IN TRANSIT - (Pictures on the right)

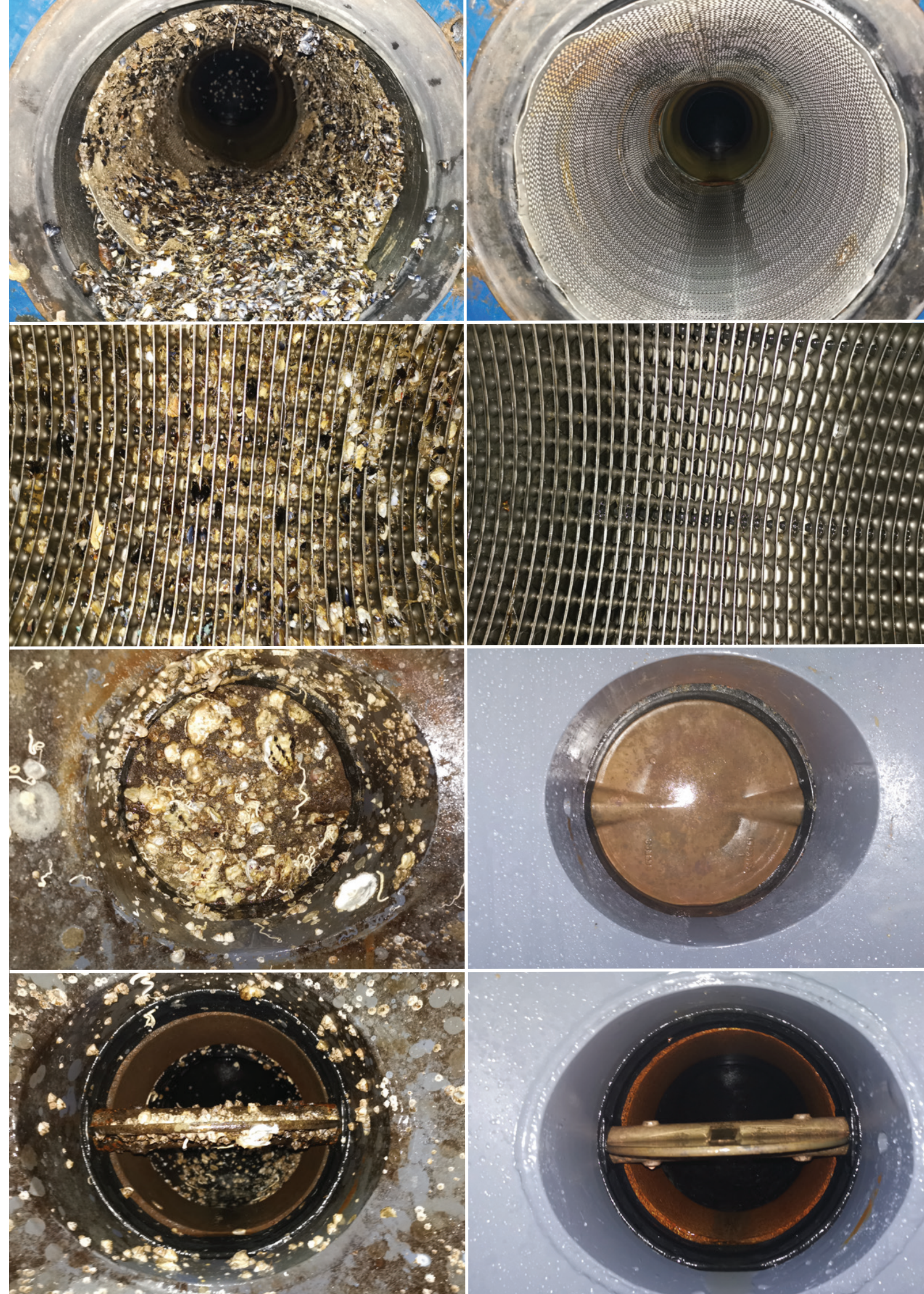
- Seawater Cooling:
- Treatment of 7 seawater cooling systems from 0.25m³ to 7m³ including; main sea chest inlet valves, strainers, pumps, valves, plate heat exchanger, outlet valves and all associated pipework
- Cooling for : engines 1-6, Thrusters 1-6 and General.
- 30 hours per system

CASE: ALONGSIDE

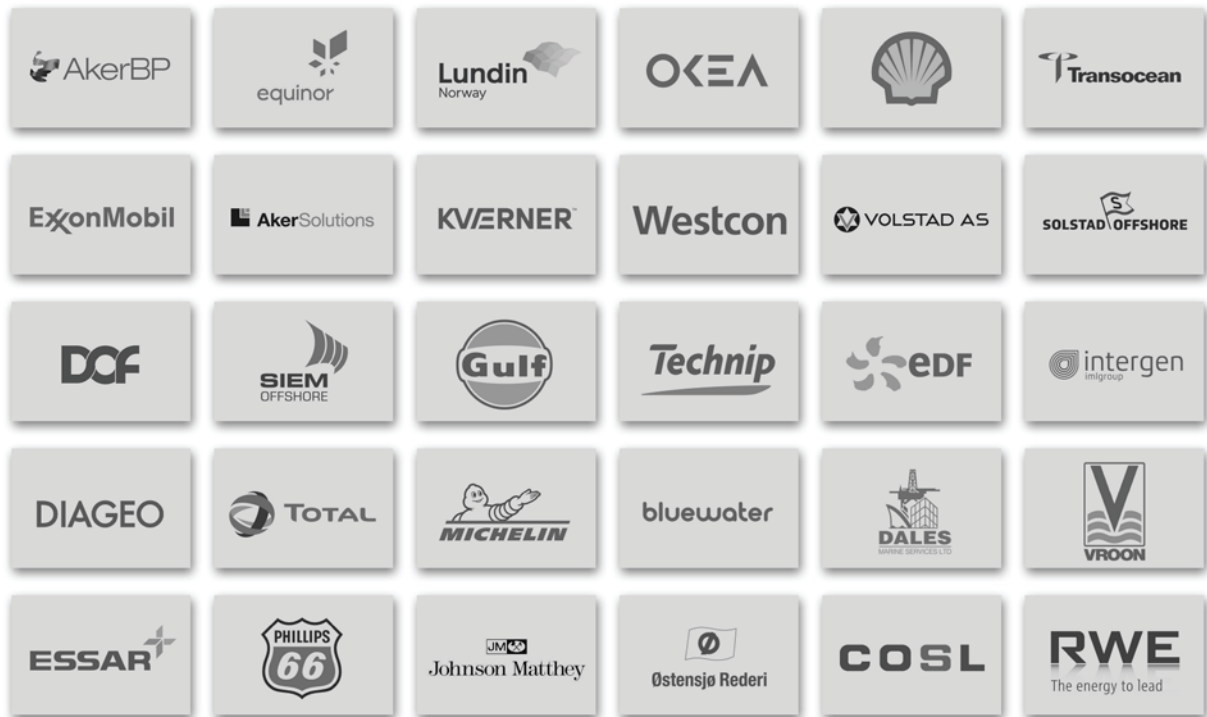
- Main Seawater system; Utility, Fire fighting, Cooling
- System volume.100m³
- 800 meters of pipework at various diameters, over 150 valves, multiple strainers and pumps
- Removal of blue mussels*
- 5 days

Technical Detail: Blue Mussels.
Two stage treatment to achieve:

- T1 – destruction of nacreous and prismatic layers (calcium carbonate – aragonite and calcite), demineralisation of Byssal threads.
- T2 – destruction of Conchiolin layer, organics in Byssal threads (ligaments and proteins), miscellaneous organics.



REFERENCES



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