

E-ChloPure®



On-site electro-chlorination to prevent biofouling
in seawater intakes & cooling systems



John Cockerill Water



E-ChloPure® reliably and safely generates on-site sodium hypochlorite from seawater destined to the treatment of industrial cooling water

Coastal industries using seawater for cooling purposes need to control biofouling to avoid the harmful deposit of organic fouling organisms like, microbes, algae and mussels in their piping systems. Chlorination reduces the biological load in hydraulic circuits and thus avoids bio-fouling. It is implemented either by dissolving chlorine gas (Cl₂) or by adding sodium hypochlorite (NaClO) to the water to be treated.



The proliferation of fouling organisms like, microbes, algae and mussels progressively reduces the heat transfer efficiency, and eventually leads to the clogging of the cooling water piping circuits of coastal industries and power plants.

A pioneer in electro-chlorination

Based on over two decades of experience, John Cockerill Environment has developed **E-ChloPure®**, its compact, continuous, and economical treatment solution for the most effective biofouling control without the undesirable side effects of commercial hypochlorite.

Besides price fluctuations, the dependency on external suppliers, and high operating cost, the associated chemical risks both for the personnel handling the products and for the environment, as well as an unfavorable carbon footprint linked to its road transport, are the major disadvantages related to the use of commercial bleach.

E-ChloPure® offers numerous advantages

E-ChloPure® safely generates sodium hypochlorite from seawater on site to treat industrial cooling water and protect the plant's cooling water piping circuits and equipment most effectively against organic fouling. Through the electrolysis of seawater, **E-ChloPure®** allows to cost-effectively generate the precise amount of hypochlorite needed on-site and inject it directly into the seawater piping circuits.

Improve CAPEX and OPEX

E-ChloPure® utilizes compressed air for the **automatic self-cleaning of the systems electrodes**, eliminating the need for acid and operator intervention. This allows for the daily cleaning of the cells while avoiding the hazards, costs and logistics associated with transporting, storing, and handling acid.

Additionally, utilizing compressed air instead of acid, for the electrode cleaning, allows to use less costly carbon steel instead of titanium cathodes and considerably increase the cathodes' lifespan to 20 years.

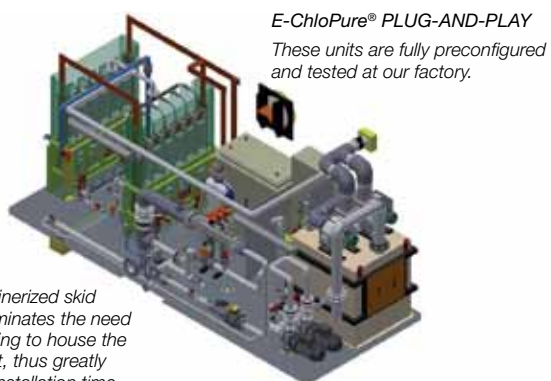
The anodes used for our **E-ChloPure®** units are made of titanium and are coated with a special catalytic coating allowing to significantly extend the recoat time of the anodes.

Eliminate Environmental Hazards

By producing sodium hypochlorite on site, **E-ChloPure®** eliminates the need for transporting, storing, and pumping large volumes of bleach, a dangerous product that is frequently subject to supply shortages and has a limited shelf-life, particularly at high temperatures.

Eliminate Safety Hazards related to H₂

E-ChloPure® features a unique design with a vertically mounted electrochlorination unit fed in parallel, which ensures optimal air circulation during cleaning and allows for the continuous evacuation of hazardous hydrogen (H₂) generated during electrolysis.



*E-ChloPure® PLUG-AND-PLAY
These units are fully preconfigured and tested at our factory.*

The containerized skid design eliminates the need for a building to house the equipment, thus greatly reducing installation time.

Electrochlorination applications



Sea water extraction stations for desalination plants



Power Stations (electrical, thermal & nuclear)



Chemical Industry



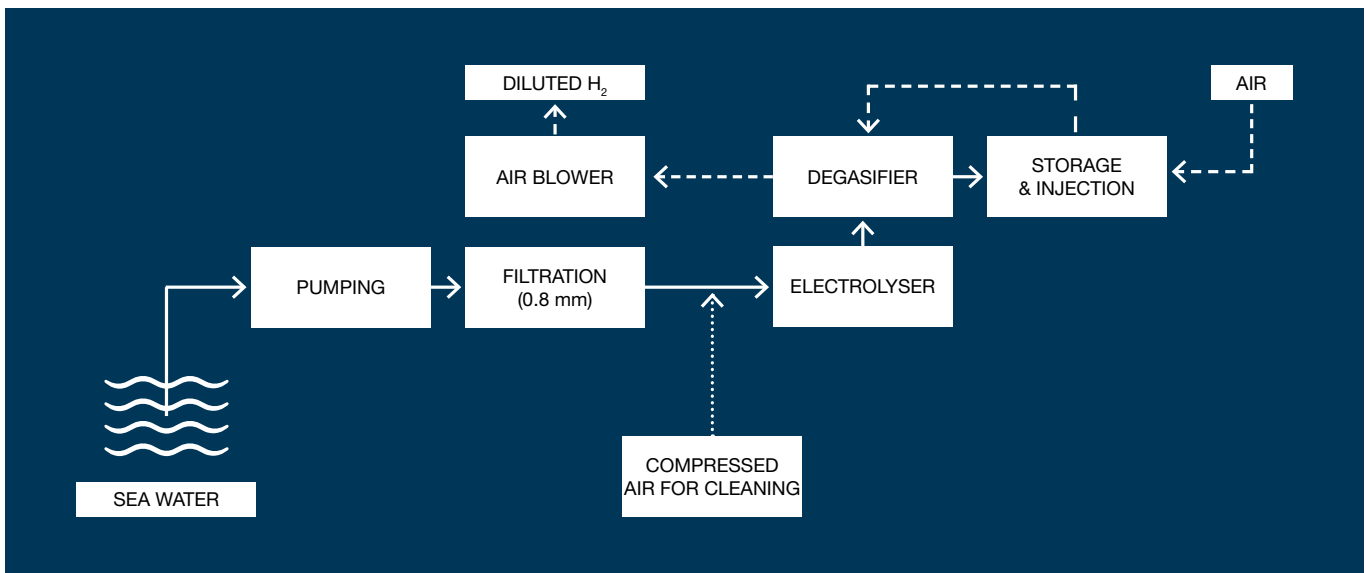
Oil & Gas industry



Refineries & Petrochemical plants



Other users of seawater as Cooling or Process Water



In situ production of Hypochlorite

John Cockerill offers modular electro-chlorination systems, suitable for any type of industrial installation. Our **E-ChloPure®** range includes easy to install mobile (plug-and-play or containerized units) or fixed systems. The fixed electro-chlorination system is made up of individual units providing up to 500 kg Cl₂/h. To treat a given flow-rate, several units are installed in parallel.

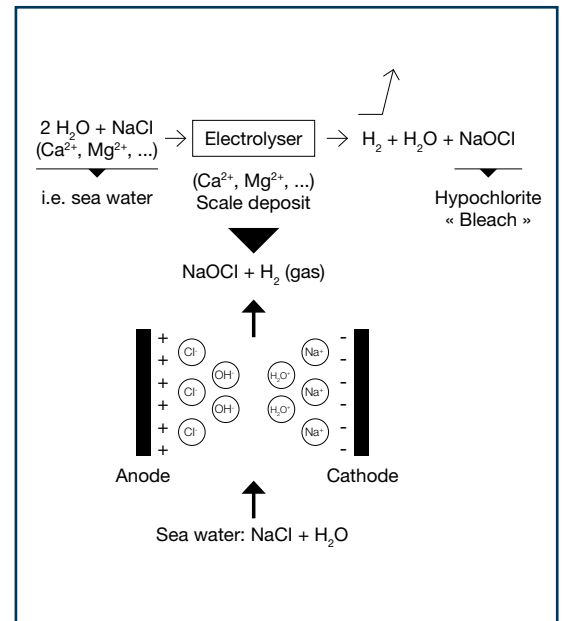
On-site systems

Production of Hypochlorite

> 48 kg Cl₂/h

Cooling circuit flow rate

> 24 000 m³/h



Plug-and-play units

Production of Hypochlorite

From 18 lbs/h (8 kg/h)

To 53 lbs/h (24 kg/h)

Cooling circuit flow rate

< 24 000 m³/h



MODEL	Nominated Rate	Feeding Flow Rate ⁽¹⁾		INPUT			Height	Lenght	Width	Weight		Compressed Air ⁽²⁾
	lbs/hr (kg/hr)	Gallon Per Minute	GMP	Power kVA	Voltage V	Ampere A	Inch (mm)	Inch (mm)	Inch (mm)	Empty lbs (kg)	In Operation lbs (kg)	Standard Cubic Feet per Minute - SCFM (Nm ³ /h)
E-ChlorePure® 8	18 (8)	97 (22)	28	400	70	102 (2 591)	238 (6 058)	96 (2 438)	8466 (3 840)	12236 (5 550)	20 (32)	
E-ChlorePure® 12	26 (12)	114 (26)	40	400	100	102 (2 591)	238 (6 058)	96 (2 438)	9370 (4 250)	13206 (5 990)	30 (48)	
E-ChlorePure® 16	35 (16)	132 (30)	56	400	140	102 (2 591)	238 (6 058)	96 (2 438)	9899 (4 490)	13845 (6 280)	39 (64)	
E-ChlorePure® 24	53 (24)	167 (38)	80	400	200	102 (2 591)	238 (6 058)	96 (2 438)	11244 (5 100)	15366 (6 970)	60 (96)	

⁽¹⁾ 58,0152 - 73 psi (4-5 bars)

⁽²⁾ 102 psi (7 bars)



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John Cockerill's solutions cater to the ecological transition and circular economy

Firmly anchored in our experience, our solid technological know-how and our bold innovation in the treatment of water, air and waste, our **Water Business Line** offers highly performant and modular solutions for the efficient treatment of industrial and municipal wastewater, the production of process water and REUSE, as well as optimized renewable methane production.

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