



eVOQUA

WATER TECHNOLOGIES

CHLOROPAC® SYSTEMS  
FOR OFFSHORE WIND

**PROTECTING HVDC  
TRANSMISSION**



# A Hidden Innovation

## HELPING PROTECT HVDC TRANSMISSION

Globally, offshore wind is becoming a leading source of renewable energy and it is critical that High Voltage Direct Current (HVDC) transmission systems meet performance requirements.

HVDC transmission systems are housed on unmanned platforms in the sea and are subject to ever changing weather conditions, temperature extremes and biofouling from marine species. While seawater is a low-cost, easily accessible coolant, the downside is fouling by scaling, corrosion and biological growth, which can damage HVDC systems over time and disrupt energy generation.

To ensure the efficient operation of HVDC systems in these complex offshore environments, Evoqua's Chloropac® system is an ideal solution.

## WHY ELECTROCHLORINATION?

Evoqua's Chloropac systems produce, the in-situ electrolytic generation of sodium hypochlorite on demand reducing cost without the use of chemicals for direct injection into the water circuit. The technology works by taking a small amount of water from a seawater cooling line which remains constantly under pressure.

The water passes at a high velocity through Concentric Tube Electrolysis (CTE) cells where part of the naturally occurring salt in seawater is converted to sodium hypochlorite. This dilute, safe solution is directly injected back into the cooling line prevents marine biofouling, corrosion, costly acid washing, and discharge of heavy metals to the aqueous environment.

## Did You Know?

Evoqua's Chloropac systems can run continuously without intervention for up to two years, providing you confidence in operational efficiency until the next planned service.



Evoqua's Chloropac® System is an ideal solution for marine growth prevention and corrosion for offshore wind HVDC transmission.

## Why Chloropac Systems?

- Safe and uninterrupted HVDC transmission systems for unmanned offshore platforms.
- Compact system for small footprints
- Hypochlorite is produced on-demand without the need for chemicals.
- Easy retrofit and cell part replacements
- High output reliability—no offline acid cleaning
- Proven for decades on numerous HVDC platforms, but all offshore applications.



Chloropac® Systems produce, in situ, a dilute, safe solution of sodium hypochlorite without the use of chemicals.

# A Safe, Sustainable & Cost Effective Solution

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.

Chloropac® systems are available in a wide range of capacities, thus enabling the cells to be packaged into standard electrolyzer or a full packaged system that is compact with a significant weight savings. These systems can be installed in standard hatchways, corridors and into existing footprints with ease.



Evoqua's Chloropac® Systems are self cleaning and maintenance is simple with minimal parts.

## RELIABILITY

- Modular design combined with high availability matches the duty with no necessity to provide full duty redundancy, resulting in lower OPEX over the life time of the system
- Benefits from Evoqua lifetime support with global service and spares availability

## MINIMAL MAINTENANCE

- Self cleaning with no chemical washing or associated downtime
- Easy, and quick individual cell replacement
- Reduced leak paths
- Local service support through factory trained engineers

## SAFETY FIRST<sup>1</sup>

- Generation is on site so no storage, handling or movement of hazardous chemicals
- Degas ensures safe hydrogen removal

## SUPERIOR DESIGN

- Reduced footprint allows for easy retrofit of existing systems or reduced floor space
- Efficient patented cells generate more sodium hypochlorite

<sup>1</sup> Refer to the Chloropac system Operating and Maintenance Manual for important safety information.

TRANSFORMING  
**WATER**  
— ENRICHING —  
LIFE



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