

# HALOX Products Fact Sheet

## Chlorine Dioxide (ClO<sub>2</sub>) For Marine Applications

### Introduction

The Halox Process of electrolytic ClO<sub>2</sub> generation was developed to bring safe ClO<sub>2</sub> to markets that could most benefit from it but would never have considered actually using it. These include sea-going vessels, offshore installations and marinas. The Halox System requires NO added acid, chlorine gas, or bleach. It uses an electrochemical method that makes up to five pounds of ClO<sub>2</sub> per day. This low maintenance, simple-to-operate system is about the size of a small refrigerator and is the perfect solution for small to medium sized marine operations.



### Chlorine Dioxide

Chlorine dioxide (ClO<sub>2</sub>) is a highly effective, environmentally friendly biocide used in a variety of disinfection applications. Because of transportation restrictions (U.S. Federal law prohibits the transportation of ClO<sub>2</sub>), chlorine dioxide is always generated on-site at the point-of-use. Traditional generator designs have kept ClO<sub>2</sub> away from many marine applications because of their inherent risks. These generators require the mixing of highly reactive chemicals (acid, chlorine gas) and they produce ClO<sub>2</sub> solutions at dangerously high concentrations.

### Biocidal Efficacy

ClO<sub>2</sub> is arguably the best biocide approved for use by the USEPA and FDA. Unlike chlorine, its effectiveness is not pH dependent, it does not form carcinogenic disinfectant byproducts (THMs and HAAs), and it is more effective at lower dosing levels. What this means for the marine industry is that potable water can actually become drinkable!

ClO<sub>2</sub> greatly reduces the biofilm layer on wetted surfaces (pipes, tanks, etc.) where microorganisms proliferate and are protected from other biocides. It addresses problems with E. coli, Salmonella and Legionella (the bacteria responsible for Legionnaire's Disease) among others. Because it is added at relatively low residual concentrations, corrosion issues usually associated with chlorine are virtually eliminated. Additionally, drums of bleach that take up precious space are no longer required.

### Chlorine Dioxide Approvals

- United States Environmental Protection Agency (USEPA)
- United States Food and Drug Administration (FDA)
- Building Services Research and Information Association of the UK (BSRIA)

### Halox Chlorine Dioxide Generators

Halox SRE electrochemical systems use electricity in the unit's cassette(s) to generate a small amount of acid to convert a single precursor, sodium chlorite, into ClO<sub>2</sub> and NaCl. There is no acid to handle, no chlorine and no bleach. Halox generators produce up to 100 g/hr (5.5 lb/day) of ClO<sub>2</sub>.

Halox Accu-Cide chemical generators safely mix dilute sodium chlorite and acid to generate chlorine dioxide. No chlorine and no bleach are used. Accu-Cide generators are available in wall-mount or skid-mount configurations and produce up to 10 lb (4.5 kg) of ClO<sub>2</sub> per day.

When operated according to Halox guidelines, Halox equipment generates a safe, dilute solution at a controlled, measurable rate that contains up to 550 ppm of chlorine dioxide. For specific sizing concentrations, please contact Halox Technical Service. Immediately after generation, the ClO<sub>2</sub> solution is fed directly to the water being treated. These self-contained systems are safe to use and simple to operate.

**Potable and Technical Water Disinfection.**

Use: Dose to bunkered water tank.

Benefits: ClO<sub>2</sub> is the Best Available Technology (BAT) for controlling water born pathogens (especially E. coli, Legionella and salmonella). Thus, its use minimizes risks from Legionnaire's Disease, coliform infection, etc. Potable water actually becomes potable. It reduces ice machine slime and is desirable for food preparation (coffee, etc.).

**Gray and Black Water Final Disinfection**

Use: Dose to final effluent (discharge).

Benefits: Minimize THM formation, meet strict coliform regulations.

**Ballast Water**

Use: Dose to ballast tanks.

Benefits: Eliminate indigenous species transplantation.

**No More Chlorine Taste, Smell and Feel**

Potable water for drinking and showers is free of chlorine taste, smell and feel. This will be noticed in food preparation, coffee machines, salon use and everywhere that passengers and crew come in contact with potable water. At the recommended concentrations, ClO<sub>2</sub> has no taste, smell, or feel.

**Benefits to Vessel Facilities Management**

1. Low dosing rates reduce systems corrosion rates.
2. Inherent biofilm control eliminates need for hyper-chlorination and superheating for pathogen control. This greatly reduces hours spent on system maintenance.
3. Discharge limits for coliforms, THMs and other regulated substances are easily met.
4. Low chemical use rate eliminates the need for storing vast amounts of chlorine bleach.

**Conclusions**

ClO<sub>2</sub> has long been recognized as the ideal biocide for numerous applications. However, traditional generation technologies have precluded many potential users from its benefits. For the first time, The Halox System makes ClO<sub>2</sub> available to anyone who wants it! Please contact Halox Technologies, Inc. to learn more.

**HALOX**

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