

### Advantages of the Slow and Steady Approach

- Any biomasses in the system will be slowly released and not clog strainers and filters.
- Reduced expense for treatment equipment built to the proper scale.
- Low chemical consumption rate eases material handling.

Fig. 1

### CLO<sub>2</sub>IX™ Systems

CLO <sub>2</sub> IX™ System	Production Rate (lb/day)	Installation Type	Ion Exchange
Commercial	0.1 - 1.5	Permanent	Replaceable
Service DI	0.1 - 1.5	Permanent	Regenerated Off-Site
Industrial	0.1 - 50	Permanent	Regenerated On-Site
Portable	0.1 - 20	Temporary	Replaceable or Regenerated

Production rate, installation type and type of cation exchange resin provided are all important factors in determining which CLO<sub>2</sub>IX™ system to choose for each chilled water loop application. For example, if the microbiological load in the system supports a one time disinfection, the Portable System is probably the best choice, because it can be moved on site to do the work and then removed when the system parameters are again in an acceptable range. However, if a permanent disinfection solution is desired, the Commercial, Service DI, and Industrial Systems are all options.

### Overview

Theoretically a closed chilled water loop system is sealed and ideally never subject to biofouling. Like a car, once the water and suitable corrosion and scale inhibitors are put into the radiator, there is no chance of contaminants from air and water to get into the loop. However, in real operation of closed loop systems that serve large buildings and campuses, leaks occur and contaminants can cause biofouling in the system. Makeup water is added, which also contributes to the microbial load in the circulating water.

Periodic addition of inhibitors and biocides are current practice. Because of concerns over corrosion, chlorine and bromine based oxidizing biocides are generally avoided and a protocol of slug dosing non-oxidizing biocides is often used. This can be quite expensive, and the best practice of routine periodic disinfection is often not followed for economic reasons.

Chlorine Dioxide is now gaining acceptance as a cost effective alternative to previous practice. This is largely due to the low corrosivity, selective reactivity, and the low dosages required to keep systems operating cleanly. The unique quality of the product from the CLO<sub>2</sub>IX™ generator and ease of use make it an attractive choice for automatic or manual dosing to chilled water loops. However, Chlorine Dioxide must be used according to best practices that recognize the singular properties of the biocide.

When dealing with already fouled systems, it is tempting to shock dose the systems for a rapid result. This can lead to a rapid release of biofilm, and consequences can include the release of under-deposit corrosion which can result in additional leaks.

A better approach is to pace the feed of high purity Chlorine Dioxide using the catalytic method of CLO<sub>2</sub>IX™. These systems produce a high purity 700 mg/l stream of Chlorine Dioxide free of metal ions and suitable for injection into the chilled water loop. The Chlorine Dioxide stream can be added to a system sump tank or directly injected into the chilled water loop depending on system requirements. Typical initial dose levels are based on total system volume at 0.2 to 0.5 lb of Chlorine Dioxide per 100,000 gallons of system volume per day. Continued maintenance doses can be reduced to 0.1 to 0.2 lb of Chlorine Dioxide per 100,000 gallons of system volume per day with time. Dosage can be continuous or intermittent at 2 to 3 times per week depending on system requirements. (see Fig. 1)

# CLO<sub>2</sub>IX™ IS THE BEST SOLUTION.

## Chlorine Dioxide is the Best Disinfectant.

For the reasons previously discussed, Chlorine Dioxide is the best biocide for the disinfection of chilled water distribution systems, and CLO<sub>2</sub>IX™ systems are the best solution for providing the Chlorine Dioxide. The CLO<sub>2</sub>IX™ systems are based on *pure water* technology found routinely in the pharmaceutical and semiconductor industries where purity and safety are not optional. The systems utilize a combination of ion exchange and catalysis to produce Chlorine Dioxide on demand. Because the Chlorine Dioxide is not produced as a batch process, there is no need for storage of the resultant solution. These reasons and others make the CLO<sub>2</sub>IX™ method of producing Chlorine Dioxide ideal for chilled water loops.

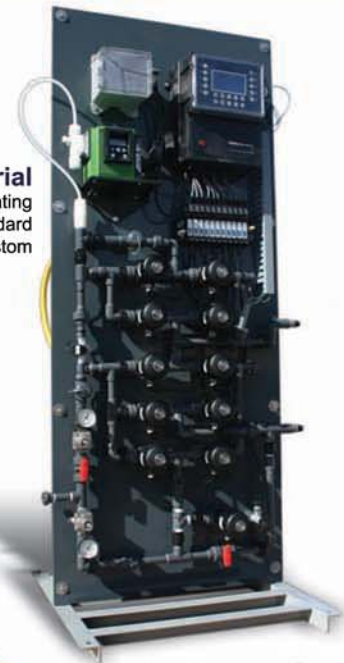
## System Features

- Pure Chlorine Dioxide solution meets FDA food contact purity specifications and EPA and FIFRA limits for chlorite and chlorate
- Not a traditional system that mixes precursor chemicals to force reactions
- Not an electrochemical system which may add corrosive oxygen or chlorine to system
- Dilute ClO<sub>2</sub> solution of 700 mg/l produced
- Self Monitoring and Self Correcting control system
- Option to proportionally dose based on flow
- Option to automatically dose with internal system timer

## CLO<sub>2</sub>IX™ SYSTEMS FOR CHILLED WATER LOOPS



**Commercial**  
Replaceable IX Cartridges  
Up to 1.5 lb/day



**Industrial**  
Self Regenerating  
Up to 50 lb/day standard  
Up to 400 lb/day custom



**Service DI**  
Service Regenerated IX Tanks  
Up to 1.5 lb/day



**Portable**  
Regenerable or Replaceable IX  
Electric or Water Driven Pump Options  
Up to 20 lb/day