GENEROX™ CSR

A total control program providing safe and economical disinfection

- Reduced overall cost
- Improved microbiological control
- Reduced energy consumption
- Reduced storage, handling and delivery of chemicals
- Reduced environmental footprint
- Enhanced worker safety

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Chlorine dioxide — providing superior disinfection

Solenis has decades of experience using chlorine dioxide (ClO_2) as a disinfectant and oxidant in both water and process treatment applications across a variety of industries. When used as part of a complete treatment program, ClO_2 has proven to be highly effective in controlling aerobic and anaerobic microbiological contamination, such as biofilm, legionella, listeria and spore-forming organisms.

Due to its fast action and lower redox potential, ClO_2 can achieve microbiological control while also providing reduced corrosion rates. Additionally, the selective oxidizing properties of ClO_2 can lead to a much lower consumption rate compared to traditional oxidizing disinfectants.

Because ClO_2 is active over a broad pH range, it can be used in a variety of applications including cooling towers, once-through systems, potable water, process water and wastewater plants. Many different industries benefit from ClO_2 including chemicals and general manufacturing, food and beverage, commercial and institutional, pulp and paper, municipal, oil refining, and power generation.

There are a number of chemistries available for producing ClO_2 at customer sites offering various advantages depending on the application. For microbiological control in larger applications, such as cooling towers and once-through systems, Solenis has launched its Generox CSR (concentrated submersible reactor) ClO_2 generation system.

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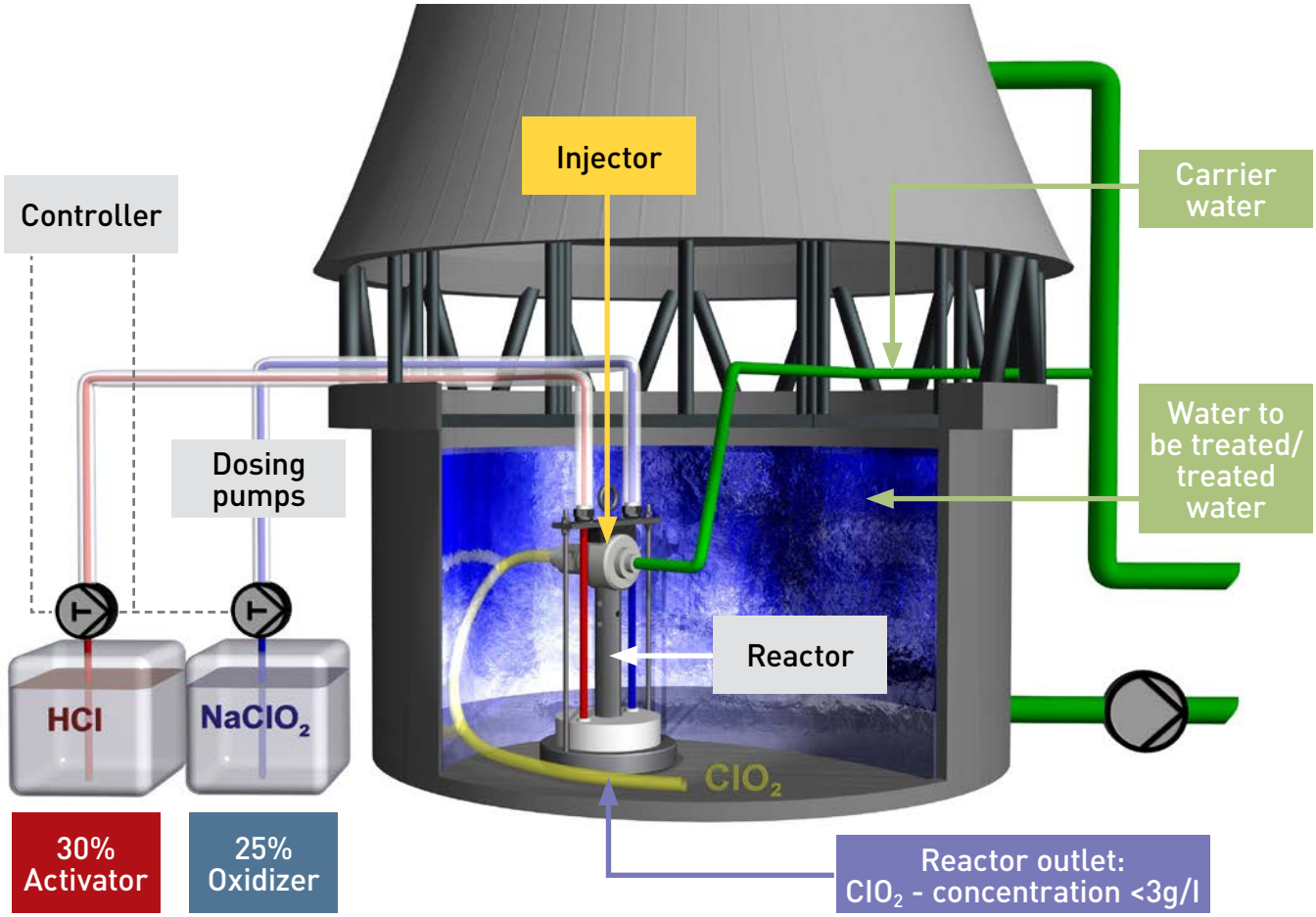
Conventional technology versus Generox CSR

PARAMETER	CONVENTIONAL TECHNOLOGY	GENEROX CSR
Location of ClO2 generation	Rooms accessible to people	In the water to be treated
Consequence	Basic cause for risk potential (ClO2 emission or explosion) Need for complex safety features and equipment	Feasibility for process optimizations
CHEMICAL REACTION – REACTOR CONDITIONS		
Precursors to be controlled	Larger volume of precursors plus dilution water	Smaller volume of precursors without dilution water
ClO2 concentration	20 g/l	> 80 g/l
Reaction time	Approximately 600 seconds, temperature dependent	Approximately 5 seconds, not temperature dependent
Achievable yield	85-95%	> 98%
Reactor volume (1 kg ClO2/h capacity)	8000 ml	16 ml
Amount of ClO2 present (1 kg ClO2/h capacity)	160 g ClO2 in rooms accessible to people	1.4 g ClO2 in the water to be treated
Reactor design	Closed, frequent pressure vessels	Open, reaction zone directly in contact with process water
DILUTION		
Recommended concentration e.g. 0.5 ppm	Direct or via intermediate level feeding tank	Direct

New procedure for water treatment with ClO_2



Generox CSR System — a proven system for safe and economical disinfection

Solenis' Generox CSR system utilizes a generator together with activator and oxidizer chemistries to provide a complete, safe and economical solution for producing ClO_2.

Compared to competitive technologies, the unique reactor design of the Generox CSR generator delivers significant performance advantages in the areas of safety and monitoring, conversion rates, as well as versatility for use with a variety of acids and concentrations.

The Generox CSR generator provides customers with a safe, effective and economical way to produce up to 50 kg of ClO_2 per hour.

Utilizing an innovative, submersible design, the Generox CSR generator enables the reaction and application of ClO_2 completely under water (e.g., in the cooling tower basin, water tank, etc.). This helps to alleviate virtually any risk of gas leaks or explosions, and can minimize costs associated with related monitoring equipment.

Additionally, the open reactor design provides for consistent precursor conversion of more than 98%, which can lead to lower chemical consumption (15 to 20% compared to commercial standard) providing customers with improved cost efficiencies.

The Generox CSR generator can utilize sulfuric acid as an alternative precursor which further improves the potential cost efficiencies by reducing chemical costs, as well as eliminating the need for additional storage and dosing equipment.

Solenis

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Solenis supplies specialty chemicals for water-intensive industries, including the pulp and paper, oil and gas, chemical processing, mining, biorefining and power markets. Whether you want to increase production, develop new products, reduce costs or simply do more with less, we can help. With our innovative technologies, passionate people and unrivaled experience, Solenis is ready to deliver the solutions you need.

To learn more, contact your technical sales representative or visit us online.

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Strong bonds. Trusted solutions.

Global Headquarters
Solenis LLC
Wilmington, Delaware
Tel: +1 302 594 5000
solenis.com