

Scotmas Group

Purify • Protect • Perform

Scotmas Alpha™

Low cost ClO₂ generation for Small Water Systems



www.scotmas.com
www.chlorine-dioxide.com



Why Chlorine Dioxide?



Destroys biofilm completely at source: Biofilm removal is the most important part of an effective water treatment system. Without it, it is simply not possible to have a safe, effective, pathogen free environment.

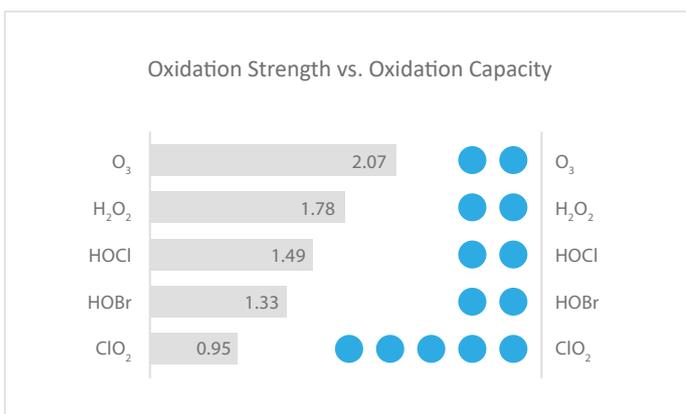
Effective against complex organisms: Chlorine Dioxide has been found to be effective against complex organisms such as cysts and protozoa including Cryptosporidium, Giardia and amoeba.

Lower biocidal concentration: Some biocides require very high concentrations to produce the required disinfection impact. Where Hydrogen Peroxide has been promoted as a biocide for water treatment, dose rates can be up to 30 times the equivalent Chlorine Dioxide dose rate to achieve the same disinfection impact.

Disinfection By-products: High concentrations of certain biocides can cause environmentally persistent, potentially carcinogenic by products to form, including Trihalomethanes, Chlorinated Organics and Bromate. Chlorine Dioxide does not react to form complex organic by products. In addition, the superior reaction efficiency of the Alpha™ minimises residual Chlorite and Chlorate levels.

Effective across the PH range: Chlorine dioxide is effective at all pH's below 12. By contrast, Chlorine is almost ineffective above a pH of 8.

Less corrosive: Chlorine Dioxide has a lower oxidation potential than all other widely used biocides, does not hydrolyse to form an acid, and therefore is less corrosive.



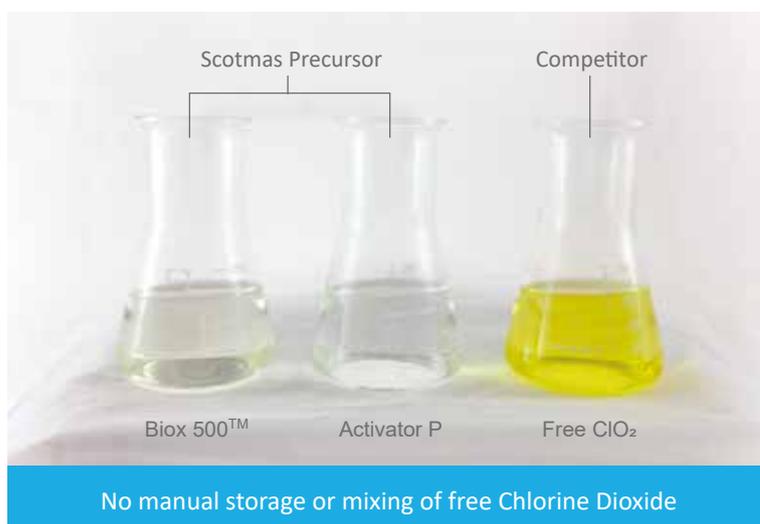
Our team of experienced engineers and project managers ensure we provide a system that is exactly suited to your requirements. Bespoke system design, with end to end responsibility for all aspects of process design, HAZID, HAZOP, LOPA, E & I Integration, Construction Supervision and Site Commissioning is a Scotmas specialism. You can be assured that our ClO_2 systems use the latest technology on the market.

Alpha™ - Low Cost ClO₂ Generation for Small Water Systems

The Scotmas Alpha™ is designed as an ideal alternative to manual dosing of water disinfectant tablets, or to the use of hazardous “pre-activated” disinfecting solutions via dosing pumps. The unique design of the Alpha™ systems opens up possibilities to continually dose Chlorine Dioxide to small water systems in order to combat the most challenging waterborne bacteria such as Pseudomonas, Legionella and coliforms.

The Alpha™ is easily installed to water pipework of 1” diameter or below, or directly to the inlet of a water tank. The system features an integrated flowmeter and microprocessor control that automatically detects water flow and applies the appropriate quantity of Chlorine Dioxide biocide. Around 250,000 litres of water can be treated from just 5 litres of each precursor chemical used, making the Alpha™ system one of the most cost effective and low maintenance methods of ensuring compliance with water hygiene requirements in challenging small water systems.

The low hazard precursor chemicals can be stored safely in an optional lockable enclosure, along with leak detection and other safety measures built into the system. The Alpha™ also provides for comprehensive remote datalogging and recording of water volumes and dose rates of water biocide applied, assisting compliance with reporting standards.

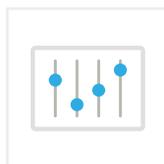


Alpha™ Key Benefits



Safety by Design

No manual mixing or handling of free ClO₂



Fully Controllable

Reliable dosing is controlled by an external meter or timer



Cost Effective

Low cost leasing models available



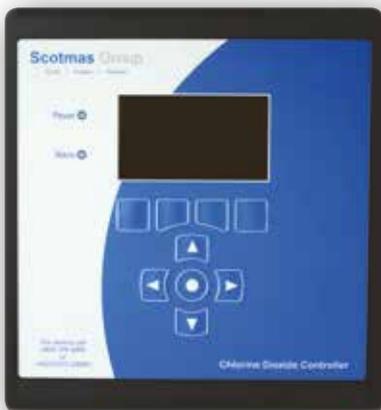
Reliability

Fully supported and serviced by our experienced, industry specialist engineers

Alpha™ Models

	ALPHA 3 LITE	ALPHA 3	ALPHA 6
OUTPUT	Up to 3,000 l/hr water treated @ 1 mg/l ClO ₂	Up to 3,000 l/hr water treated @ 1 mg/l ClO ₂	Up to 6,000 l/hr water treated @ 1 mg/l ClO ₂
	Generates up to 3g ClO ₂ /hr	Generates up to 3g ClO ₂ /hr	Generates up to 6g ClO ₂ /hr
CONNECTION	¾" Tank	½" In Line @ 3 bar	¾" In Line @ 3 bar
DISPLAY	-	Touchscreen	Touchscreen
CHEMICAL STORAGE	-	2 x 5L Lockable Cabinet	2 x 5L Lockable Cabinet
LOGGING & REMOTE ACCESS	Web Access	Touch Display & Web Access	Touch Display & Web Access

Sentinel Guard™



The Scotmas Sentinel Guard™ is the ideal companion to our Chlorine Dioxide generators, and provides for 24/7 monitoring, control and datalogging of ClO₂ and chlorite residuals. Every Sentinel Guard™ unit is provided with access to our InSite™ web based monitoring platform which provides for secure, off-site storage and viewing of datalog graphs for a period of up to 3 years – ideal for compliance and audit purposes.

Offering the ability to monitor up to 3 separate parameters such as Chlorine Dioxide, chlorite (the primary disinfection by-product of ClO₂ disinfection), and safety gas alarms, the Sentinel Guard™ provides total safety assurance and secondary monitoring of Chlorine Dioxide residuals, in compliance with the requirements of drinking water quality regulations.

When linked with our Alpha™ range of generators, the Sentinel Guard™ can cut off the ClO₂ dose in the event of a high threshold being reached. When linked with our more advanced WX and MX models, the Sentinel Guard™ can provide a full data stream to the on-board PLC which will automatically adjust the dose rate utilising our Adaptive Dosing™ technology.

Applications



Poultry

Our poultry water sanitation solutions are trusted to move beyond simple water disinfection, and can integrate with complex nutritional and vaccination regimes to ensure maximum growth and performance, whilst improving flock welfare.

Our poultry water treatment programs include state of the art performance monitoring and on-site specialist support to protect your investment. Scotmas' technical teams work alongside your nutritional and veterinary specialists in order to achieve unbeatable flock performance, and a truly integrated approach to poultry biosecurity.



Livestock

Access to clean water is vital for profitable animal rearing and milk production. Regardless of the source of your water, bacterial infection can build up in water tanks, pipework and drinking troughs, leading to poor water quality and associated animal husbandry problems.

The low dose rates of Chlorine Dioxide required, and our automatic dosing equipment ensure that our disinfection systems are entirely compatible with other veterinary treatments such as vaccines and vitamins that may be periodically dosed through the water system.



Building Services

Building owners face ever increasing scrutiny of their water distribution systems, and the traditional approach of heating hot water to above 50°C has been shown to be insufficient in many instances. Scotmas can provide an automatic, fully monitored Chlorine Dioxide water disinfection system to eliminate legionella, pseudomonas and other bacteria within the biofilm that builds up in your water pipework.

Our equipment is designed with full auditing to conform with the requirements of your Risk Assessment or Water Safety Plan, and our experienced installers liaise with your risk assessors to ensure the highest standards of water safety are maintained.



Healthcare

Healthcare environments present some of the greatest challenges in keeping complex hot and cold water systems free from dangerous pathogens such as Legionella and pseudomonas. Scotmas Bravo systems use the latest chemistry and engineering technology to generate tiny amounts of Chlorine Dioxide on-demand within the water system, for safe, verifiable, hospital water control.

Scotmas are proud to protect over 20,000 patients in trusts across the U.K. who use our advanced Chlorine Dioxide dosing system, to provide high quality water where it is needed most.

Proving the value of Scotmas Alpha™ for Drinking Water for Pigs



Swine producers are often heavily focused on their animals' feed. Costs are high, the problems associated; e.g., the presence of toxins and pathogens that can be transferred to the animals from the feed, create a constant headache. Water is as vitally important to maintaining healthy animals and increasing profits as feed.

Unfortunately, water is an excellent source for disease transmission, especially in swine, and although consumer and government regulatory attention tends to focus on E. coli and Salmonella, a wide range of disease-causing pathogens are transmitted through drinking water. A further complication arises

in areas where many animal producers use the same water supply and the consequences of water contamination can be disastrous. To control costs, some producers may be utilising inefficient substances and procedures to avoid contamination by waterborne pathogenic microorganisms.

Against this background, Scotmas were asked to complete a trial at a pig farm. Prior to the trial all sheds were treated with chlorine tablets. For the trial, water supplies were separated to allow maintenance of the existing chlorine tablet regime in 50% of the sheds as a control, and the introduction of a Scotmas Alpha™ Chlorine Dioxide generator in the other 50% of the sheds in the trial.

WATER SAMPLES

During the trial, water samples were collected from the drinking points in the farm several times. Samples from the control sheds had clear evidence of contamination with e.coli and coliform. Water samples from the test sheds showed clear evidence of a reduction in contamination, and by the conclusion of the trial period contamination levels were below accepted levels for human consumption standards.

ANIMAL HEALTH

Pigs in the test sheds showed a number of differences with those in the control sheds.

- There was a small decrease in the mortality rate.
- Average weight per pig was 4.10% greater.
- Limited information was provided by the farm, however it can be stated that the medication costs were lower.
- Pigs had much less diarrhoea.

CONCLUSION

Dirty, contaminated drinking water leads to costly diseases in animals that can adversely impact them their entire lives. Antibiotic usage is tightly regulated and so utilising effective water treatment programs to stop infectious agents is essential. By attacking pathogens at their source, Scotmas Alpha™ Chlorine Dioxide generators reduce bacteria harmful to pig production and are an effective tool in providing clean nutrients to pigs, resulting in a more efficient and profitable enterprise.

Scotmas Alpha™ Installation Avoids Major Capital Expenditure



A leading private healthcare provider was faced with water hygiene challenges within a wing of a major facility. Due to poor pipework design, water temperatures could not be maintained <math><20^{\circ}\text{C}</math> at all times, leading to the proliferation of pseudomonas and associated legionella bacteria within the water system. Repeated “disinfection and cleans” of the pipework had been carried out previously, causing major disruption to the normal operation of the facility, however it was noted that bacteria had returned to the water system at the usual levels within just a matter of weeks.

ISSUES

- Bacterial levels within the water were of significant concern to infection control and water hygiene specialists, leading to potential closure of the wing due to patient risk.
- Major building works would have been required to remediate/replace the affected pipework.
- Water hygiene was being maintained adequately through temperature control elsewhere in the facility, meaning that there was no justification to treat the entire site water demand.
- Point of use filtration was being used within the affected wing as an interim measure, how this was a costly and disruptive solution, requiring regular maintenance and monitoring.
- There was no dedicated plant room available for the wing, which was supplied from a branch of the main water feed.

SOLUTION

A Scotmas Alpha™ system was installed within a locked cleaners cupboard within the wing. The lockable chemical cabinet supplied with the Alpha™ system stored the 5 l chemical precursors securely from other staff using the room, and the compact wall mounted design of the Alpha™ did not affect available floorspace in the room. The $\frac{3}{4}$ ” water pipe feeding the wing was fed via the Alpha™ system which automatically dosed Chlorine Dioxide into the water feeding the wing, in compliance with WHO drinking water standards.

Chlorine dioxide dosing was noted to have an immediate effect on the growth of biofilm within the water pipework. Within a few weeks, total bacterial counts within the system had reduced to $\frac{1}{4}$ of their previous level, and within 2 months were of equivalent standard to those found elsewhere within the healthcare facility. Over this period, the Chlorine Dioxide was gradually breaking down the biofilm within the water pipework, removing the pseudomonas and other bacteria such as Legionella which can become embedded within.

As a result of the introduction of the Alpha™ system, it was possible to remove the requirement for point of use filtration, and to avoid the requirement for major capital expenditure on pipework alterations and/or whole site water treatment solutions. The remote access capabilities built into the Alpha™ system allowed for effective monitoring of water usage on the wing, along with regular manual testing of ChlorineDioxide residuals at tap outlets using an approved test kit.



Scotmas Group are world leading manufacturers of Chlorine Dioxide products and dosing systems. Scotmas were the first Company to produce simple, easy to use Chlorine Dioxide products and equipment. With over 30 years' experience, our friendly and approachable team of chemists, microbiologists, engineers and project managers are able to provide "off the shelf" products or a complete turnkey service.

Choose Scotmas for expertise in Chlorine Dioxide solutions.

Scotmas Group

Purify • Protect • Perform

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v.1.1

Use biocides safely. Always read the label and product information before use.