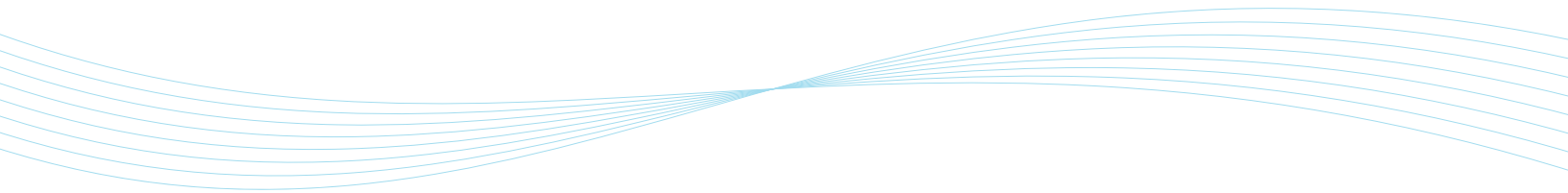




evoqua  
WATER TECHNOLOGIES

DISINFECTION  
SOLUTIONS FOR  
WATER TREATMENT

**OPTIMIZE YOUR  
PERFORMANCE**



# Leading Disinfection Technology for Over 100 Years

## ABOUT US

Evoqua Water Technologies is a leading manufacturer and a trusted partner of disinfection solutions. We are passionately committed to optimizing performance and helping organizations that value clean, safe and reliable water to ensure compliance through our broad portfolio and global expertise.

Our 100-year heritage of water innovations ensure health and safety, enable performance, and create sustainable environments. Our world-class expertise and ever-expanding portfolio of products has established Evoqua as the trusted advisor to municipal, industrial, and recreational customers worldwide.

“Enabling a more sustainable water system for future generations is both our opportunity and our responsibility.”

Ron C. Keating  
CEO

## LET US TAKE CARE OF THE WATER

Evoqua provides disinfection solutions for municipal, industrial, and recreational water applications. Our full range of disinfection technologies include analyzers and process controllers, ultraviolet disinfection systems, hypochlorite generation systems, gas feed systems, chlorine dioxide generation equipment, ozone systems, and more.

With our extensive disinfection portfolio, we offer solutions to meet nearly any disinfection need, large or small, and have experienced sales and customer support teams to help address any challenge. You worry about the production and let us take care of the water!

## Industry Trusted Brands

We are proud to be the home of a wonderful collection of time honored, reputable, well established, and industry trusted brands like Wallace & Tiernan® systems, ETS-UV™ systems, Pacific Ozone™ generators and systems, Depolox® analyzers, and many more.



Our UV, ozone and chlorine disinfection systems can provide a broad spectrum of control over a variety of contaminants of concern in a number of applications.

## TRANSFORMING WATER. ENRICHING LIFE.®

Evoqua has been transforming water for our customers, communities, and planet for over 100 years. We understand that your water disinfection solutions need to eliminate pathogens in a safe, reliable way while ensuring operational resilience and a reduction of long-term expenditures.

We recognize our role in, and impact on, the world and are committed to ensuring safe and sustainable business practices for ourselves, our customers, and our partners. Here at Evoqua we promise to:

- Always Work Safely and Do What's Right
- Provide High Quality Solutions
- Meet or Exceed Your Expectations
- Stay Committed to Sustainability
- Deliver on our Promises

## SOLUTIONS FOR A VARIETY OF MARKETS



### AGRICULTURE, PRODUCE & FOOD PROCESSING

- Fresh produce/fruit washing
- Product preservation
- Packaging sanitization
- Equipment and surface sanitization



### AQUACULTURE

- Incoming water treatment
- Wastewater management/ disinfection
- System sanitization
- Product processing



### BEVERAGE

- Product water preparation
- Clean-in-place
- Tank, equipment sanitization
- Bottle and cap rinsing



### DATA CENTERS & MICROELECTRONICS

- High-purity process water
- Cooling tower water
- Industrial water recycle & reuse



### MARINE

- Potable water/effluent treatment
- Process water
- Seafood processing
- System sanitization



### MUNICIPAL DRINKING WATER

- Disinfection byproduct control
- Disinfection for distribution process
- Taste & odor control



### MUNICIPAL WASTEWATER

- Biological wastewater treatment
- Clarification for wastewater treatment
- Odor & erosion control



### PHARMACEUTICALS

- Purified water
- Laboratory water purification
- Sanitization of water systems

## TECHNOLOGIES FOR EVERY APPLICATION

Application	UV	Ozone	OSEC	Gas Chlorination	Chlorine Dioxide	Analyzers & Controllers
Barrel Sanitization		•				•
Bottle Rinse	•	•	•		•	•
CIP	•	•	•		•	•
Cooling Towers	•	•	•	•	•	•
De-chlorination	•	•				•
De-ozonation	•					•
Final Product		•			•	•
Potable Water	•		•	•	•	•
Pre-treatment	•	•	•	•	•	•
Product Water	•					•
Rinse Water	•	•	•			•
RO/CDI Protection	•					•
Surface Sanitization		•	•			•
Utility Water	•	•			•	•
Water Re-Use	•	•	•	•	•	•
Wastewater	•		•	•	•	•

# Ultraviolet Solutions

## CHEMICAL FREE DISINFECTION

UV is a proven and safe method of disinfection. It can offer protection against a variety of microorganisms including chlorine resistant pathogens such as Cryptosporidium and Giardia. This highly efficient technology does not add chemicals and by lowering the use of existing chemicals can minimize disinfection byproduct formation.

UV is effective as a primary and secondary disinfection barrier and is often used in conjunction with chlorine disinfection to provide a residual post UV.

Evoqua's range of high-quality, reliable UV systems are installed around the world to improve water quality, to support compliance needs, and to enable future resilience.



Ultra-Efficient VX UV System

## WHAT IS UV AND HOW DOES IT WORK?

Ultraviolet disinfection works by using short wave UV light between 200–315 nanometers. UV light at this wavelength is absorbed by the DNA of microorganisms and efficiently disinfects any fluid passing through the system. Validated by extensive testing for reliable performance, Evoqua is heavily invested and committed to providing the best UV technology into disinfection strategies.

## THE EVOQUA UV SOLUTION

Specializing in both ultra-compact medium pressure and high output low pressure amalgam UV systems, Evoqua offers a range of integrated UV systems to suit many applications and enhance the quality of water. Evoqua's compact systems ensure power efficient, high intensity delivery of UV within a small footprint for installation flexibility.

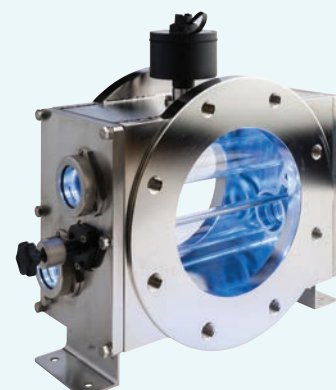
Operators will benefit from the compact Spectra control system, a state-of-the-art microprocessor, which offers standard and advanced features with simple operation and easy maintenance.



UVLX-30800-30 low pressure amalgam system operating at a UK drinking water plant

## ADVANTAGES OF UV DISINFECTION

- Proven solution against microorganisms such as cryptosporidium and giardia
- Safe and easy to operate technology
- Easy to install and retrofit into existing plants
- Highly efficient technology reduces CAPEX
- Simple and low maintenance technology reduces OPEX
- Independent 3<sup>rd</sup> party validated performance to USEPA UVDGM where applicable



Ultra-Compact WAFER™ UV System

# Ozone Systems

## SIMPLE. PROVEN. OZONE TECHNOLOGY.

Ozone is a highly efficient disinfectant against yeasts, molds, bacteria, viruses and biofilms plus has been globally adopted in water treatment processes for decades. Ozone is particularly suited for the food and beverage industry due to its ability to disinfect microorganisms without adding any residual chemicals to process. This avoids the issue of creating disinfection byproducts associated with other disinfection methods, leaving no harmful chemical residuals or altering the taste which is essential for this industry.



PGS Packaged System

Ozonated water can also be used to disinfect equipment and surfaces. It can also be used to sanitize hygienic production areas, packaging/filling lines and help to preserve food in the storage. Ozone can be the perfect replacement of hot water disinfection which avoids frequent heat expansion of pipes, joints and tank material.

## WHAT IS OZONE?

Ozone, the tri-atomic form of oxygen ( $O_3$ ), is a very powerful oxidizer with twice the oxidizing potential of traditional disinfection agents. There are many applications that utilize the effects of ozone. One of the most popular applications is the use of ozone as a microbiological disinfectant. As a microbiological disinfectant, ozone works by oxidizing the cell's membrane and interfering with the metabolism of the cell, and killing it.

Ozone is most commonly produced for industrial use by high voltage electrical discharge (corona discharge). Corona discharge is the most efficient commercialized method for ozone production. We use a reaction chamber with a dielectric barrier in which high voltage is applied to an oxygen feed gas to generate ozone. Modern corona discharge units are adjustable to throttle ozone production up or down under dynamic conditions when load and demands change. Most advanced corona discharge ozone generators use enriched oxygen from oxygen concentrators (usually +90% by weight) as the feed gas for more efficient ozone production and lower overall operating costs.

## THE EVOQUA OZONE SOLUTION

Evoqua's Pacific Ozone™ System uses an innovative floating plate technology to produce ozone which allow us to be very compact without compromising the efficiency of our ozone generators. In addition, our generators are air-cooled which results in less maintenance, lower power consumption, and ease of installation.

Pacific Ozone Systems provide safe and sustainable solutions to disinfection processes, yielding measurable results that can give customers operational peace of mind. With the Pacific Ozone Packaged Generator Systems, all you need is air, water, and electricity to increase the efficiency and safety of your process.

## ADVANTAGES OF OZONE

- Chemical Free: no harmful disinfection byproducts in the process or waste
- Safe and controlled
- No required flushing of the system
- No chemical transportation/storage
- Increases the up-time of your operations. Typical sanitization cycles are reduced by 30% to 75%
- Ozone can be removed instantaneously in the water by UV at 254 nm
- Saves energy as no hot water is required
- Reduces OPEX and increases ROI

# On-site Hypochlorite Generation Solutions

## OSEC® SYSTEMS

On-site electrochlorination provides valuable security of supply by generating a sodium hypochlorite solution on-site, on-demand for the disinfection of water. Electrochlorination produces a sodium hypochlorite solution through the electrolysis of salt (brine). The safe and simple method is widely adapted by water utilities, commercial pools, datacenters, cooling towers, and more, to eliminate harmful microorganisms in water and has several advantages over other chlorination and disinfection systems. Key among these advantages are safety and sustainability.

## WHAT IS THE OSEC SYSTEM AND HOW DOES IT WORK?

OSEC systems generate a low pH sodium hypochlorite solution by electrolyzing a brine solution directly on-site. The resulting solution contains <1% sodium hypochlorite and can be dosed directly into the water system. The sodium hypochlorite is prepared as it is needed with no long storage periods. The OSEC system provides you with powerful disinfection in a simple and sustainable process.

The only chemical required on site is salt which is non-hazardous and can be conveniently purchased in 25 kg bags or as a powder by road tanker deliveries. It is also widely available from many suppliers which ensures security of supply.

## ADVANTAGES OF OSEC SYSTEMS

- Safe and sustainable method of producing chlorine on-site
- Easy to use systems that are highly reliable in operation, simplifying your disinfection
- Significantly lowers operating costs and increases safety when compared to using purchased bulk hypochlorite
- No handling of dangerous chemicals: consumes salt, water and electricity
- Storage of a low quantity of disinfectant for economic production according to demand
- Increases plant security and independence
- Cost savings can be achieved via off-peak production scheduling
- Capable of compliance with drinking water regulations



OSEC B-PAK System



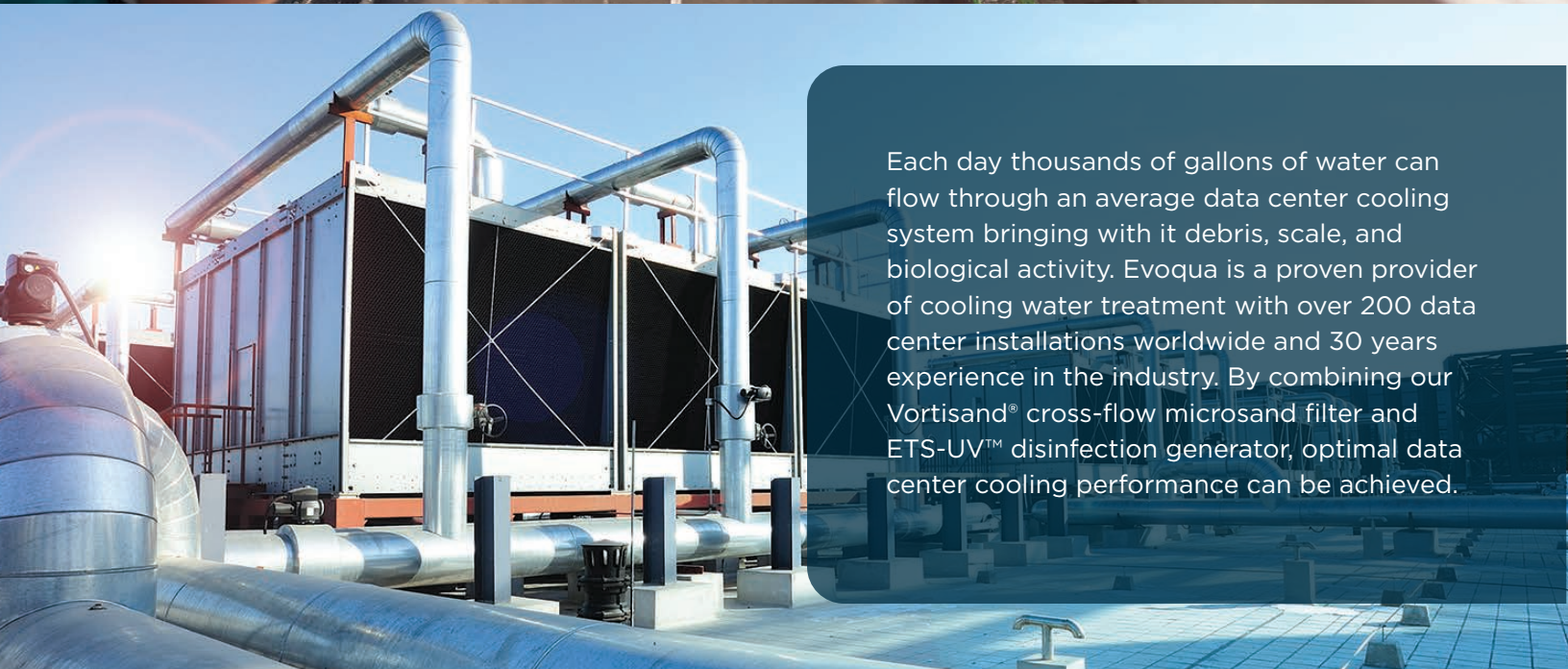
OSEC L System



Food and beverage processors use large quantities of water to transform raw ingredients into marketable products. This requires large volumes of water, both as an ingredient in products and in the plant sanitization process, which all needs to be responsibly managed. Balancing consumer pressures for a smaller environmental footprint and sustainable operations, as well as managing rising utility costs and evolving regulatory requirements, are also ongoing concerns for processors and are areas where we can help.



Evoqua has contributed to cleaner, safer drinking water for municipalities for over 100 years. Drinking water also requires effective disinfection, taste and odor control and treatment at the source. Based on your water we can meet or exceed your treatment goals with permanent installations, emergency mobile response, short-term, or long-term solutions.



Each day thousands of gallons of water can flow through an average data center cooling system bringing with it debris, scale, and biological activity. Evoqua is a proven provider of cooling water treatment with over 200 data center installations worldwide and 30 years experience in the industry. By combining our Vortisand<sup>®</sup> cross-flow microsand filter and ETS-UV<sup>™</sup> disinfection generator, optimal data center cooling performance can be achieved.

# Gas Chlorination

## CHLORINE GAS FOR DRINKING & WASTE WATER TREATMENT

Chlorine gas has been the predominant chemical used for the disinfection of drinking water supplies since our founders Charles F. Wallace and Martin F. Tiernan installed the first chlorinator in New York over 100 years ago. Evoqua's gas feed line continues to lead the market using the latest remote vacuum and solution feed technology, designed with V-notch high precision dose control.

Selecting the right gas feed equipment and safety accessories can ensure simple and reliable disinfection dosing, easy maintenance and total safety for the operating personnel.

## HOW CHLORINE GAS INJECTION WORKS

Gas Chlorination is one of the most economic disinfectants available as gaseous or liquid chlorine supplied in cylinders or ton containers. Using a remote vacuum operated gas feeder, a chlorine solution is prepared on site from chlorine gas and water. Evoqua offers the V10K™ vacuum gas feeder featuring the proven V-notch flow control technology for safe and accurate dosing and control of gaseous chlorine, and other gases such as ammonia and sulfur dioxide.



V2000™ Vacuum Gas Feed System

To ensure a safe connection between the chlorine gas bottle and the dosing vacuum system, Evoqua's S10K vacuum regulator establishes a safe process by only operating if a vacuum is present, making it the preferred choice for delivering chlorine gas to the water flow.

## GAS SAFETY

The Evoqua gas detection system is a dual channel measuring system that can be used to measure chlorine gas, chlorine dioxide or ozone. It provides extra safety for operating personnel due to its automatic fault detection and sensor monitoring capabilities.

## ADVANTAGES OF EVOQUA GAS DISINFECTION

- Differentially regulated technology
- Safe, simple and reliable disinfection: chlorination and dechlorination
- Accurate and reliable all-vacuum dosing
- Destroys a broad range of microorganisms
- Scalability and low cost
- Elemental Cl<sub>2</sub> does not degrade and remains at a consistent concentration under pressurized cylinders



V10K™ Vacuum Gas Feed System



S10K™ Vacuum Regulator





## Chlorine Dioxide

### DOSE QUALITY CHLORINE DIOXIDE

Chlorine Dioxide is a highly effective disinfectant and oxidizing agent that offers many clear advantages to ensure a clean and safe water supply. It helps to destroy waterborne pathogens, parasites and microorganisms in biofilms (prevention of Legionella and pseudomonas), control taste and odor, and is used for the oxidation of iron and manganese, as well as control of algae growth. The solution, compared to chlorine, minimizes formation of bromates and THMs (Trihalomethanes), and reduces formation of organochlorine compounds (AOX). In addition, it does not react with ammonia to form chloramines.

### THE EVOQUA CHLORINE DIOXIDE SOLUTION

Evoqua's Millennium III range produces a high quality, chlorine dioxide solution that will improve efficiencies and can be used in some applications to prevent bacterial outbreaks. Effective as both a disinfectant and oxidizing agent, it is also ideal for the control of biofilm and zebra mussel control within inlet systems.



Millennium III™ Chlorine Dioxide Generators

### THE EVOQUA ADVANTAGE

- More effective against planktonic bacteria and biofilms
- Effective at a very low dose rate
- Stable disinfection over a wide pH range
- Reliable and safe generation system
- Lower reactivity with natural organic matter than chlorine

# Analyzers & Controllers

## COMPLETE ANALYSIS AND CONTROL OF WATER QUALITY

With ever increasing demands on companies to provide and utilize safe and clean water for their customers, constant monitoring of water quality parameters is critical. Evoqua's solutions ensure the effective management of water production and water distribution networks with analysis technologies that provide accurate, real time measurements and monitoring systems for total control of water quality parameters.

## THE EVOQUA SOLUTION

Evoqua offers a range of single and multiparameter analyzers, and single and multichannel controllers to help ensure greater measurement confidence and the delivery of safe, compliant water to the public. Monitoring water quality requires accurate on-line residual monitoring which has been synonymous with Depolox® analyzers for over 60 years.

Evoqua analyzers can incorporate a range of measurement parameters including but not limited to: free or total chlorine, chlorine dioxide, ozone or potassium permanganate, as well as either pH or fluoride and Redox (ORP).

## THE EVOQUA ADVANTAGE

- Simple set-up and data management for complete control of water quality
- Seamless integration into existing systems
- Compliance-focused support to meet disinfection regulations
- Minimize chemical overdosing risks
- Enables quick identification of quality issues
- Modern communication options such as Ethernet (HTTP Protocol/Modbus® TCP) and RS 485 interface
- Fast response time to meet fluctuating disinfection demands



The innovative interface with self-explanatory features reduces maintenances and training time and therefore optimize your running costs.



The Depolox measurement module is one of the fastest on the market and helps to reduce chemical overfeed, and therefore optimizes the ecological footprint.



## Service

### SAFEGUARDING YOUR INVESTMENT

Evoqua Water Technologies is one of the world's leading providers for water treatment equipment. We offer municipal and industrial customers sustainable solutions for highly efficient water usage and supply.

When you purchase solutions from Evoqua or one of our trusted channel partners, you are entering into an on-going relationship with our team of specialists who understand your process and your productivity goals—even as they evolve over time.

### EVOQUA SERVICE

- **Service Contracts**—Recurring scheduled services with a defined scope of work for operations, or maintenance of a customer's water treatment systems.
- **Field Services**—One time event services covering a broad range of activities; equipment repairs, warranty services, new equipment start-ups, unscheduled maintenance and safety audits.
- **Retrofits and Upgrades**—Technical services associated with unit operations audits, water and energy audits, and equipment improvements/upgrades for Evoqua or other installed solutions.
- **Spare Parts/Repairs**—Evoqua provides quick and reliable service for both proprietary spare parts, consumable items and comprehensive repair services for clients.
- **Training**—Evoqua offers training directly from the manufacturer and therefore first hand know-how. The courses comprise the entire disinfection range.

TRANSFORMING  
**WATER**  
— ENRICHING —  
**LIFE**



**AQUA  
ANALYTIC**

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