

PDOevo^{PLUS} Ozone Systems

LET'S SOLVE WATER AND MINIMIZE THE ENERGY

WEDECO

a xylem brand

Ozone. Effective and environmentally friendly.

Ozone is one of the most powerful commercially available oxidants and is commonly used for municipal water and wastewater treatment. In addition to its oxidizing capabilities, it is an environmentally-friendly method of treatment. Pollutants, colored substances, odors and microorganisms are directly destroyed by oxidation, without creating harmful chlorinated by-products or significant residues.

By decomposing to oxygen as it reacts, ozone provides a cost effective and environmentally-friendly alternative to oxidation with chlorine, absorption (activated carbon), or other separation processes (membrane technology).

Advantages of ozone

- Ozone eliminates bacteria, viruses and most other organic and inorganic contaminants
- Ozone can replace and significantly reduce levels of dangerous chemicals such as chlorine
- Ozone acts as a flocculant aiding in the removal of minerals such as iron and manganese
- Ozone leaves neither chlorinated by-products nor unpleasant chemical tastes or odors
- Ozone is generated safely on-site and controlled on demand from air/oxygen and power
- No storage and handling of oxidants and other chemicals

The oxidative action of ozone

Ozone reacts quickly with a large number of compounds. In doing so, these compounds are attacked either directly by the ozone molecule or indirectly by the intermediately occurring hydroxyl radicals. Preferably the ozone is completely consumed entirely in this reaction process, releasing only oxygen. In case of remaining ozone in the off-gas, these residues are converted back to oxygen by a residual ozone destructor.

By combining ozone with UV or peroxide, advanced oxidation processes are formed which are able to reduce even the most persistent substances. These advanced oxidation processes (AOP) help to render other, previously non-degradable, water pollutants harmless.

The ozone generator

The central element in ozone production is the ozone generator, which produces the gas on-site from oxygen. If an easy-to-use system to fulfill small to medium ozone production requirements is needed, then look no further than Xylem's Wedeco PDOevo^{PLUS} ozone generators - a completely integrated system capable of producing 1,000 to 15,000 lbs. of ozone per day or 18 to 300 kg per hour.

Xylem's PDOevo^{PLUS} ozone generators deliver maximum performance with a large range of customization options to meet specific needs. PDOevo^{PLUS} systems feature advanced Effizon® evo 3G electrode technology and a superior generator design. The result is unequalled solutions in terms of performance, efficiency and operational stability.

Effizon® evo 3G electrodes are the core components that use oxygen and energy in an efficient manner to generate ozone. The ozone production process also requires cooling water for heat dissipation and maintaining an efficient process. It is the sophisticated interplay between these components and processes that distinguishes the high efficiency, reliability and flexibility of Wedeco ozone systems.

Elements that achieve high efficiency, reliability and flexibility.

ENERGY

Modern ozone systems require less energy than anticipated. With the Effizon® evo 3G electrodes, Xylem has lowered the energy consumption by up to 11%. This means that Wedeco systems are among the most energy-efficient systems in the world.

OXYGEN

The Effizon® evo 3G electrode technology allows up to 30 times less nitrogen dosing than comparable competitor solutions. This considerably reduces the formation of nitrogen oxides (NOx), as well as potential corrosion and performance issues. Furthermore, the technique is insensitive to elevated concentrations of hydrocarbons (THC) in the feedgas supply. This permits a high degree of flexibility when selecting potential gas suppliers. The flexibility even extends to the oxygen feedgas used. Wedeco generators can be designed and delivered ready to utilize different oxygen sources such as air, liquid oxygen, or on-site generated (PSA) oxygen.

COOLING WATER

Efficient cooling of the electrodes is crucial for optimizing plant performance. The new PDOevo^{PLUS} is engineered to excel in this regard, and uses cooling water proportionate to the demand. Remarkably, it maintains peak ozone production efficiency even when cooling water temperatures reach as high as 35°C/95°F. This superior performance ensures both high efficiency and reduced water consumption, making the PDOevo^{PLUS} an exceptional choice for demanding operational environments.

PDOevo^{PLUS} customized ozone systems. Engineered to be the best choice for every application.

The PDOevo^{PLUS} ozone systems are providing reliable and efficiently large quantities of ozone. These systems can be customized and fully integrated fitting seamlessly into local conditions and processes/applications

Xylem's Wedeco ozone systems are delivering one of the most competitive lifecycle cost benefits in the market, thanks to low energy consumption combined with low investment costs without compromising quality and ease of use.

1. The ozone generator is equipped with Effizon evo electrodes from both sides.
2. The pipework is made exclusively from stainless steel and is equipped with all necessary and desired monitoring and concentration measurement instruments. All fittings and instruments are arranged for ease of operation, maintenance and control. Inlets and outlets are designed to suit local conditions.
3. The footprint is reduced by up to 20% as a result of the optimum arrangement of the generator vessel, pipework and electrical cabinets.
4. The air conditioning system separates the electrical components from the ambient air and ensures protection class IP 54. This allows operation under ambient conditions with high temperatures (up to 35°C/95°F), high humidity (up to 90%), and harsh or dusty surroundings.

Integrated sustainability

Wedeco ozone systems intentionally reduce the ecological footprint through minimized energy consumption and increased system reliability resulting in the use of less spare parts and maintenance. Consequently, CO_2 emissions are reduced. In addition, our production facilities conform to recognized international environmental management standards (ISO 14001).





Control and monitoring

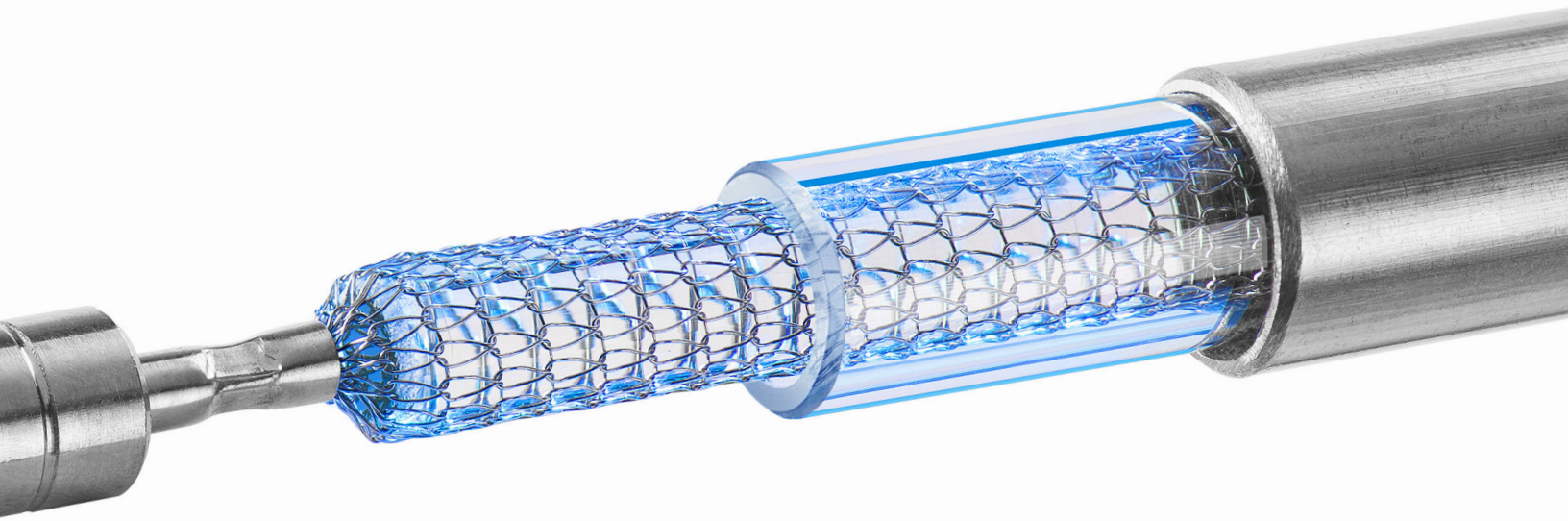
A PLC system with a local HMI control touch screen panel takes care of internal control and monitoring of ozone production.Main brands such as Allen Bradley, Mitsubishi, Schneider or Siemens can be implemented depending on customer requirements. Network interfaces such as Profibus or Ethernet are included in the scope of options.

Effizon® evo 3G – Intelligent Electrode Protection Making fuses a thing of the past.

The Effizon® evo 3G electrode, the core element of every PDOevo^{PLUS} ozone system, enables achieving a level of reliability and energy efficiency that is unattainable with most other electrode technologies. The distinctive feature of this electrode is its unique double discharge gap. Ozone is formed on both sides of the dielectric, therefore lowering the applied specific energy and increasing ozone production.

The electrodes are manufactured from inert materials making them highly resistant to corrosion. This means that Wedeco ozone generators are practically maintenance free, making any regular cleaning or replacement of the electrodes unnecessary.

Effizon® evo 3G electrodes are utilizing multiple, independently operated safety features are - Intelligent Electrode Protection (IEP). The IEP complements the existing active protection interlocks inside the power supply unit with an additional passive electrode protection. The IEP does not rely on active controlled processes thanks to the new glass core technology of Effizon® evo 3G electrodes. In contrast to traditional safety concepts, such as fuses or coatings, the innovative Intelligent Electrode Protection is not prone to any false detection in the event of electrode defects.



Creating ozone by silent electrical discharge

Effizon® evo 3G electrodes create ozone using the principle of silent electrical discharge, transforming oxygen molecules to ozone.

Medium voltage with variable frequency control is applied between the grounded tube and the electrode. Both elements are separated by a dielectric.

The unique dual gap electrode technology guides the oxygen gas flow across the electrical field formed on the inside and outside of the glass tube dielectric. A fraction of the oxygen molecules is split in the electric field and spontaneously form ozone molecules by combining with another oxygen molecule. This is resulting in efficient and increased ozone production on both sides of the dielectric element due to lowering the applied specific energy.

Customizable options for the Wedeco PDOevo^{PLUS}

The Wedeco PDOevo^{PLUS} series ozone generators stand out in the market due to their comprehensive range of options and ancillary equipment, all designed to enhance performance and flexibility. Our solutions come equipped with advanced instrumentation, PLC logic, and other essential controls to ensure optimal operation. Beyond just meeting standard requirements, our product expertise and superior assessment capabilities allow us to deliver tailored solutions that exceed industry norms. This positions the PDOevo^{PLUS} as a leader in efficiency and control, setting us apart from competitors and ensuring that our offerings are not only comparable but superior in providing high-performance ozone generation.

Options

Containerized systems	Insulated, lighted and painted container Complete alarm and safety concept according to international standards Electric heating and ventilation fan
Instrumentation and control	Ozone concentration control Ozone residual in water Alarm monitoring and indication System control based on process signals monitoring
Feed gas supply	Liquid oxygen (normally supplied by the oxygen manufacturer) PSA – Oxygen (On-site generation, Pressure swing adsorption) Air preparation comprising air compressor, desiccant dryer, filtration
Ozone mixing and contacting	Side stream injection systems Fine bubbles diffusers Closed reactors Degassing tanks Demistors
Electronic process control	Operation panel Overall process control
Ozone destruction in off gas	Catalytic ozone destructor Blowers
Cooling water supply	Air / water cooled chiller units Heat exchangers

Technology engineered to deliver superior results to clients world wide.

Maximum ozone availability

- Highest system availability, thanks to virtually maintenance-free Effizon® evo 3G electrode technology; electrodes do not require any regular replacement or cleaning

Lowest lifecycle costs

- Lowest aftermarket costs on the market, thanks to virtually maintenance-free electrode technology
- High oxygen supply security at moderate costs as higher THC values pose no technical problem
- Nitrogen dosing up to 30 times lower than competitors
- Low specific energy consumption - further reduced by up to 25% compared to competitive ozone systems
- Broad system portfolio enables precision designing to suit requirements

Maximum operating flexibility

- Ease of choice for local gas suppliers / qualities
- All ozone systems can be designed to operate with air, LOX or PSA oxygen
- Efficient operation at elevated cooling water temperatures (up to 35°C/95°F)
- Startup to maximum capacity in only 30 seconds, thanks to reliable and thermal shock-resistant electrodes
- Smooth ozone capacity control (from 1–100%) to suit process requirements

Customer-oriented solutions

- System customization available to meet specific requirements
- Fundamental in-house process knowledge through Xylem's R&D department
- Complete process peripherals and customer solution available from a single source

Simple implementation and installation

- Experienced team of project engineers, application developers and service personnel
- Completely preassembled and tested
- Container solutions can be built to fit local requirements (preliminary work, building, etc.)
- Comprehensive connection options to superordinate controls (e.g. via SCADA, Profibus, etc.)

Simple maintenance and operation

- Local control touch screen panel (HMI)
- Easy access to all systems and fittings relevant to service
- Operation and diagnosis via network control (remote diagnostics)

Xylem |'zīləm|

1) The tissue in plants that brings water upward from the roots;
2) a leading global water technology company.

Xylem (XYL) is a Fortune 500 global water solutions company that empowers customers and communities to build a more water-secure world. Our 23,000 diverse employees delivered combined pro forma revenue of $8.1 billion in 2023, optimizing water and resource management with innovation and expertise.

Join us at **www.xylem.com** and Let's Solve Water.

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Xylem Services GmbH
Boschstrasse 4 - 14
32051 Herford
Phone +49 5221 930 0
Fax +49 5221 930 222
www.xylem.com

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