



Ozone Systems for Cooling Water

Ozone – perfect oxidant/disinfectant for cooling water treatment

Cooling systems provide ideal growth environments for bacteria, legionella, algae, fungi and mollusks which can adhere to pipeline, heat exchanger and cooling tower surfaces. The result can be reduced heat transfer efficiency, increased corrosion and potential system failure.

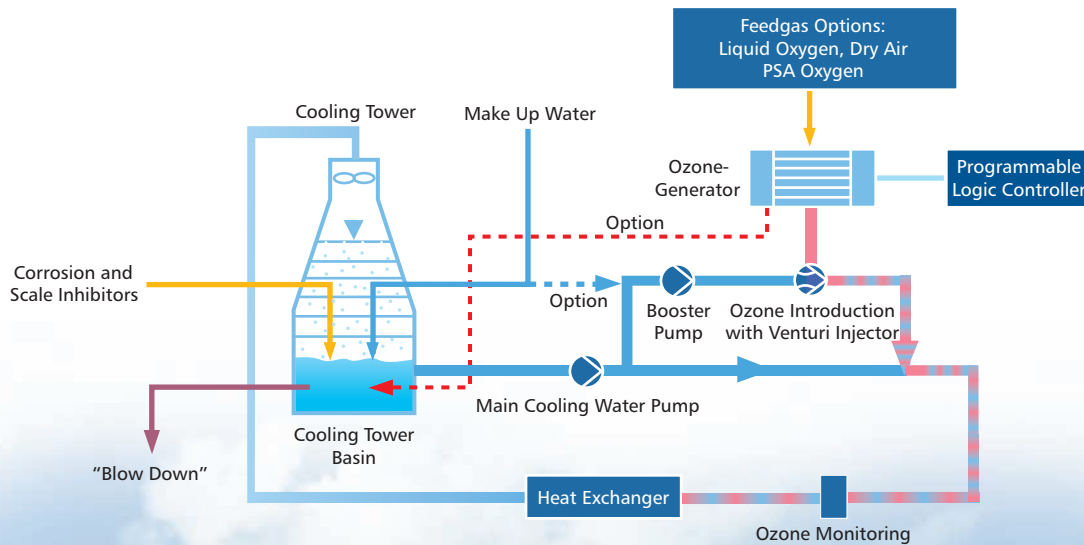
Ozone removes and prevents the growth of these organisms while reducing contaminant levels (e.g. AOX and COD) through direct oxidation. Contrary to conventional halogen based biocides, ozone does not produce unwanted by-products such as halocarbons (AOX).

Simple, fully automated process

As a general rule, ozone is produced on-site from air or oxygen gas and introduced preferably directly into the cooling water via sidestream injection. It may also be introduced under certain conditions directly into the cooling tower reservoir. Once it is dissolved in water, ozone proceeds to oxidize organic contaminants and microorganisms. The dosing is regulated automatically by the system programmable logic controller (PLC) and varies with the water demand. Ozone, combined with suitable corrosion and scale inhibitors, provides the optimum treatment solution for cooling water.

ADVANTAGES
• Most powerfull disinfectant
• Excellent cooling water quality assured
• Very effective control of Legionella
• No storage / handling of hazardous chemicals or biocides
• Blow down water complies with strictest standards for AOX and COD
• Microorganism growth is prevented
• Increased cooling system efficiency through better heat transfer
• Fully automated process
• No harmful by-product formation
• Cleaning downtime reduced
• Easy integration in existing plants

Flow diagram of a typical ozone cooling water treatment system



Proven advantages in operation

More than 20 years of operational experience in cooling towers for all different industrial users confirm the effectiveness of ozone as an environmentally compatible, cost-effective disinfectant for cooling water treatment.

Microbiological quality

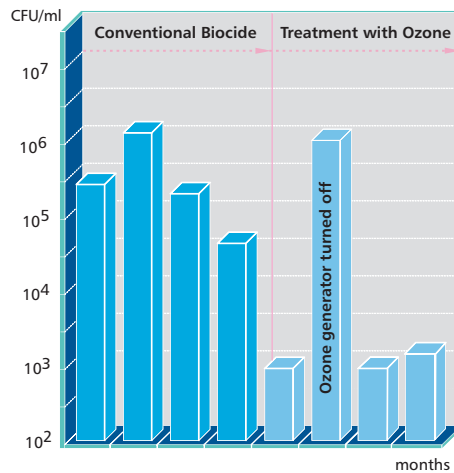
Biofilms, if not removed properly, provide ideal growing conditions for legionella. In addition to providing a more effective method of reducing microorganism concentrations in cooling water, ozone removes and prevents regrowth of biofilms in piping, heat exchanger and cooling tower surfaces. Due to the excellent biocontrol the visibility depth of the water is increased drastically. Customers report on ozone as the best method preventing effectively legionella growth.

Improved corrosion protection

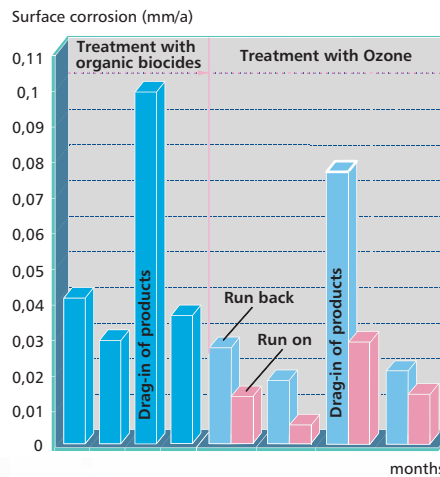
Long-term surface corrosion rates have been studied for ozone as well as conventional treatment systems. Typically, when ozone is combined with suitable inhibitors the rate of corrosion is significantly lower than generally accepted corrosion rates of 0.1 mm/year.

Reduction of AOX and COD

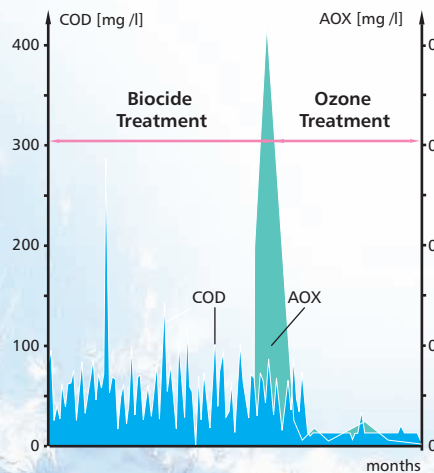
A substantial reduction in adsorbable halogenides (AOX) and COD levels are achieved after switching to an ozone treatment program. Compliance with strict discharge regulations (AOX < 0.15 mg/l, COD < 40 mg/l) can be easily achieved.



Comparison of cooling water microbiological quality using conventional biocides and after switching to an ozone based program



Comparison of corrosion rates before and after switching to an ozone based program



Comparison of AOX and COD levels before and after switching to an ozone based program

Effizon® HP – Efficient ozone generation for high concentrations

WEDECO EFFIZON® HP ozone systems offer users the highest levels of ozone generation with minimal levels of power consumption. Together with their excellent reliability and ease of operation, they provide users with optimal economic benefit. The systems, consisting of an ozone generator, power supply unit and programmable logic controller (PLC), including fittings, pipes and wiring, are compactly constructed on a skid or inside a tailor made container. A wide range of options enables the systems to be ideally tailored for specific applications.

ADVANTAGES
• Low power consumption
• Compact, space-saving design
• Robust design
• Highest operational reliability
• Standard and tailor made solutions
• Low total investment and operating costs
• IP 54 protection class

Efficient, reliable technology

WEDECO ozone systems are manufactured to high quality standards and subjected to rigorous factory testing before delivery. They are easy to operate and engineered with special focus on reliability and safety. All components are made of the highest quality materials (316 stainless steel, Teflon, glass). They meet strict German and EU standards for ozone systems (DIN 19627) as well as all relevant electrical and mechanical safety regulations.



Ozone system type SMO 800 S



Ozone system type OCS-GSO

Energy efficient

WEDECO has developed unique electronic control and power conversion equipment to optimize the efficiency of its ozone generators. All electrical systems are constructed in accordance with VDE (Assoc. of German Electrical Engineers) as well as European standards and includes only high quality components from respected manufacturers.

Electronic system control

Monitoring and control of all important system parameters is carried out using sophisticated PLC control units. This allows for infinite, precise control of ozone production as well as the entire ozone treatment process. Customer specific requirements are always incorporated into the overall system control.

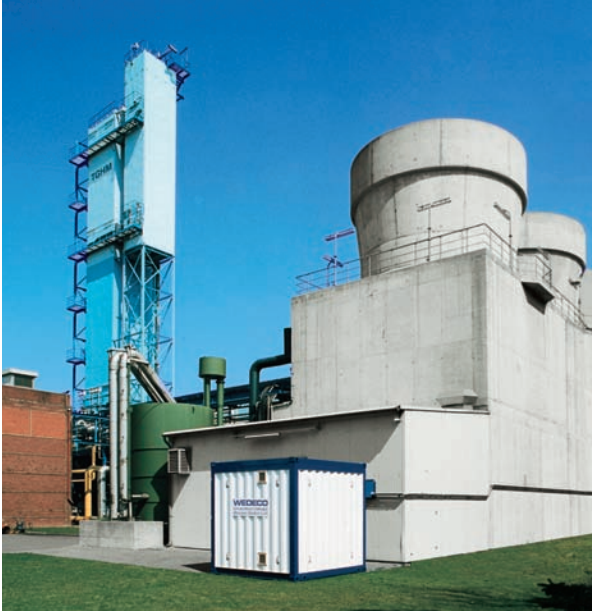


Heat exchanger fouling with conventional biocide treatment program



Heat exchanger after switching to ozone treatment

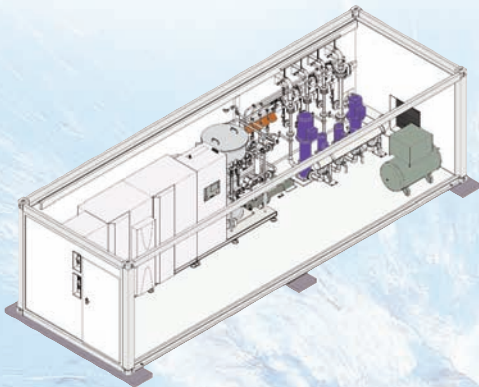
WEDECO – your partner for cooling water treatment



Compact containerized system for ozone treatment of cooling water at an air separation plant



Containerized ozone system type SMO



Containerized ozone system type SMO

WEDECO, as a global leader in cooling water treatment with ozone, has extensive experience in the use of ozone to improve cooling water quality. As an alternative to conventional biocide chemicals, ozone represents a more effective and environmentally friendly solution. WEDECO ozone systems are currently integrated in cooling water treatment programs at a wide range of industrial sites such as

- Petrochemical plants
- Air separation
- HVAC systems
- Power plants
- Chemical plants
- Steel and metal production sites.

Equipment of the highest quality and reliability, coupled with extensive process know-how make WEDECO the ideal partner for keeping your cooling systems clean and efficient.

A cost-effective solution

WEDECO ozone treatment systems can be integrated into existing cooling loops without additional capital expense. Low operating costs (oxygen and power consumption only) are achieved due to permanent low ozone dosage levels.

WEDECO's comprehensive package

- Water analysis and laboratory testing
- On-site pilot plants
- Project management, manufacture, delivery, installation and commissioning
- Standardized (and tailor made) treatment solutions
- Complete cooling water treatment packages combining ozone and dosing equipment
- Full-service contracts
- Rental services

CONTACTS

AUSTRALIA / SOUTH-EAST ASIA

WEDECO Pty. Ltd.
Unit 31, Slough Estate
Holker Street
Silverwater NSW 2128
Australia
Tel.: +61 2 9751 7500
Fax: +61 2 9751 7511
E-mail: wedeco.au@itt.com

AUSTRIA

WEDECO VISA Water Technology GmbH
Seyrlstrasse 2
A-4863 Seewalchen am Attersee
Tel.: +43 7662 5626 0
Fax: +43 7662 5626 20
E-mail: wedeco.at@itt.com

CHINA

WEDECO
c/o ITT
31 Floor, Tower A
Hongqiao City Center
No. 100 Zunyi Road
Shanghai, 200051
Tel.: +86 21 2208 2888
Fax: +86 21 2208 2999
E-mail: wedeco.cn@itt.com

FRANCE

WEDECO France S.A.S.
29-31 boulevard de la Muette
F-95145 Garges-lès-Gonesse Cedex
Tel.: +33 1 34534500
Fax: +33 1 34530196
E-mail: wedeco.fr@itt.com

GERMANY

WEDECO AG
Boschstr. 4
D-32051 Herford
Tel.: +49 5221 930 0
Fax: +49 5221 930 222
E-mail: wedeco.de@itt.com

WEDECO GmbH
Boschstr. 6
D-32051 Herford
Tel.: +49 5221 930 0
Fax: +49 5221 930 222
E-mail: wedeco.de@itt.com

GREAT BRITAIN

WEDECO Ltd.
Unit 7, Mercury Park
Mercury Way
Urmston
GB-Manchester M41 7LY
Tel.: +44 16 1865 5000
Fax: +44 16 1865 5500
E-mail: wedeco.uk@itt.com

ITALY

WEDECO SRL
Via Tridente, 22
I-70125 Bari
Tel.: +39 080 5910511
Fax: +39 080 5910514
E-mail: wedeco.it@itt.com

KOREA

WEDECO Co., Ltd.
Rm# 1017, Doosan Venture Digm Bldg.
126-1, Pyeongchon-Dong, Dongan-Gu
Anyang-Si, Kyeonggi-Do
Korea 431-070
Tel.: +82 31 478 5577
Fax: +82 31 478 5588
E-mail: wedeco.kr@itt.com

NETHERLANDS

WEDECO B.V.
Steenovenweg 5
NL-5708 HN Helmond
Tel.: +31 492 472464
Fax: +31 492 472635
E-mail: wedeco.nl@itt.com

NEW ZEALAND

WEDECO Ltd.
P. O. Box 101-303
NSMC
Auckland 1310
New Zealand
Tel.: +64 9 448 21 24
Fax: +64 9 448 21 25
E-mail: wedeco.nz@itt.com

NORTH AMERICA

WEDECO, Inc.
14125 South Bridge Circle
Charlotte, North Carolina 28273 USA
Tel.: +1 704 7167600
Fax: +1 704 7167601
E-mail: municipaluv@itt.com
municipalozone@itt.com

POLAND

WEDECO sp. z. o. o.
ul. Polna 1b
PL-62-025 Kostrzyn Wlkp.
Tel.: +48 61 8970 660
Fax: +48 61 8970 661
E-mail: wedeco.pl@itt.com

SPAIN

WEDECO Rex S.A.
Calle Isla de la Palma 32
Nave 6, Polígono Ind. Norte
San Sebastian de los Reyes
E-28700 Madrid
Tel.: +34 91 659 1800
Fax: +34 91 659 1801
E-mail: wedeco.es@itt.com

SWITZERLAND

WEDECO GmbH
Birkenweg 4
CH-8304 Wallisellen
Tel.: +41 43 355 7010
Fax: +41 43 355 7011
E-mail: wedeco.ch@itt.com

UNITED ARAB EMIRATES

WEDECO
c/o ITT
Twin Towers
P.O. Box 35226
Dubai U.A.E.
Tel.: +971 4 2294944
Fax: +971 84 680139
E-mail: wedeco.de@itt.com

www.wedeco.com

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