



WHY DO WE NEED TO TREAT DRINKING WATER?

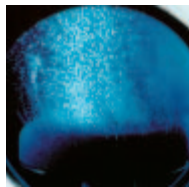
Drinking water is treated to kill or inactivate any pathogenic micro-organisms such as viruses, bacteria and parasites, to remove inorganic and organic trace contaminants which have found their way into the water system because of pollution and to reduce the naturally occurring organic compounds such as humic acid and algal metabolites. In general, surface waters such as lakes and rivers contain higher levels of micro-organisms and are more prone to contamination than groundwater and require different treatment regimes. To reduce the risk to consumers, more and more countries are introducing new drinking water regulations containing stricter limits on pathogens and contaminants.

OUR SOLUTION TO YOUR PROBLEM

Because of its comprehensive portfolio, Ozonia can offer a wide range of solutions for municipal applications. Ozonia's products have been designed so that they can be integrated into all types of treatment steps with the minimum amount of work and time. Equipment technologies include a large spectrum of UV reactors and ozone generators. Depending on the application in question, Ozonia can supply either a single technology or adopt a multi-process approach to achieve the desired result.

OZONE

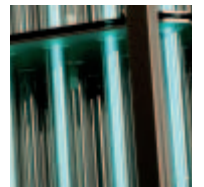
Ozone has been used by municipal bodies for many years to improve the aesthetic qualities of water and for its germicidal action. It is an accepted fact that drinking water is disinfected when a residual ozone level of 0.4 mg/l has been maintained for a period of 4 minutes. Ozone has many additional benefits in the drinking water process:



- In preozonation, ozone improves clarification, limits the formation of haloform precursors, reduces iron and manganese and promotes the destruction of micro-organisms such as algae.
- Main ozonation treatment breaks down trace contaminants and enhances the biodegradability of organic substances which are then removed in a biological treatment step.
- Finally, combined treatment steps involving ozone and activated carbon or ozone and peroxide are currently the most powerful means available to water process engineers for the removal of contaminants and constitute a vital safeguard against contamination entering a drinking water system.

UV

UV irradiation systems disinfect by inactivating pathogenic microorganisms, such as viruses, bacteria and parasites. In the UV-C light spectrum (200-280 nm), the wavelength 254 nm has been proven to be the most efficient wavelength to inactivate micro-organisms by damaging the nucleic acids (DNA and RNA), which disrupts the organism's ability to replicate.



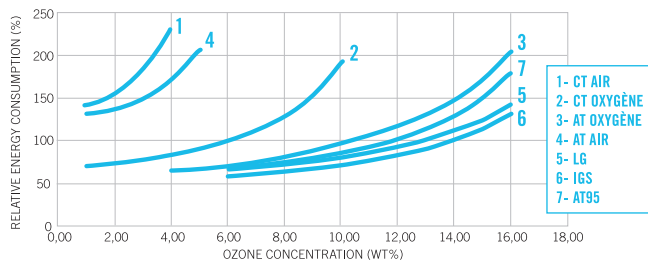
In normal applications, UV has the advantage that no chemicals are added to the water being treated and that no disinfection by-products are formed.

Due to the small foot print, the UV equipment can be easily integrated into most existing water treatment plants. Degremont Technologies has developed an extensive range of AQUARAY® products which are ideally suited for municipal applications.

OZONE

Ozonia offers state of the art equipment reflecting the very latest dielectric and power electronic technologies. In addition, clients can profit from a unique professional expertise and over thirty years of experience in ozone generation and application know-how. A widely proven and reliable medium frequency technology results in very high ozone yields from both oxygen and air. With thousands of installations around the world, several of them over 10,500 lb/day, Ozonia offers unrivalled international experience.

The table shown illustrates the ozone generator technology over the years and compares conventional technology (CT) with Ozonia's advanced technology (AT) with both oxygen and air feed gas.



UV

Microorganisms	UV-C Inactivation @ 40mJ/cm ² dose
Giardia Lamblia	> 4 Log (>99,99%)
Cryptosporidium Parvum	> 4 Log (>99,99%)
Escherichia Coli	> 4 Log (>99,99%)
Staphylococcus Aureus	> 4 Log (>99,99%)
Streptococcus Faecalis	> 4 Log (>99,99%)
Poliovirus Type 1	> 4 Log (>99,99%)
MS-2	< 3 Log (<99,9%)
Bacillus Subtilis	< 2 Log (<99%)
Adenovirus Type 40	< 2 Log (<99%)

The UV germicidal effect is dependent on the dose measured in mJ/cm², which is the factor of the UV intensity and the irradiation time in the reactor chamber. It can be seen on the table that the germicidal reduction rate, at a given UV dose, is dependent on the species of micro-organism. For chlorine resistant micro-organisms, such as *Cryptosporidium Parvum* and *Giardia Lamblia*, these are easily inactivated with a low UV dose.

To optimize the UV dose and, consequently, the reactor efficiency, Ozonia uses advanced Computerized Fluid Dynamic modeling tools. The theoretical and CFD results used by Ozonia are validated by independent third-party bio-dosimetry tests to obtain German DVGW, approval from the French ministry of health and American US EPA certification. UV represents one of the most cost effective (CAPEX and OPEX) technologies for disinfection applications.

FOR ADDITIONAL INFORMATION

To obtain more information on our UV and ozone solutions for your application, you have several possibilities :

- Consult the equipment/process brochures included in our catalogue
- Go to our online Catalogue (www.degremont-technologies.com)
- Contact our UV and ozone specialists



Contacts

WWW.DEGREMONT-TECHNOLOGIES.COM

Ozonia North America	• info-ozonia@degtec.com	• + 1 201 676 2525
Ozonia International Ozone	• info-ozoniaCH@degtec.com	• + 41 44 801 8511
Ozonia France	• info-ozoniaFR@degtec.com	• + 33 1 58 81 50 00
Ozonia Triogen UK	• info-triogen@degtec.com	• + 44 13 55 220 598
Ozonia Russia OOO	• info-ozoniaRU@degtec.com	• + 7 831 434 1628
Ozonia Korea	• info-ozoniaKR@degtec.com	• + 82 31 701 9036
Ozonia China	• info-china@degtec.com	• + 86 10 659 73 860
Ozonia Japan	• info-japan@degtec.com	• + 81 3 544 46 361

Manufacturers' Representative: