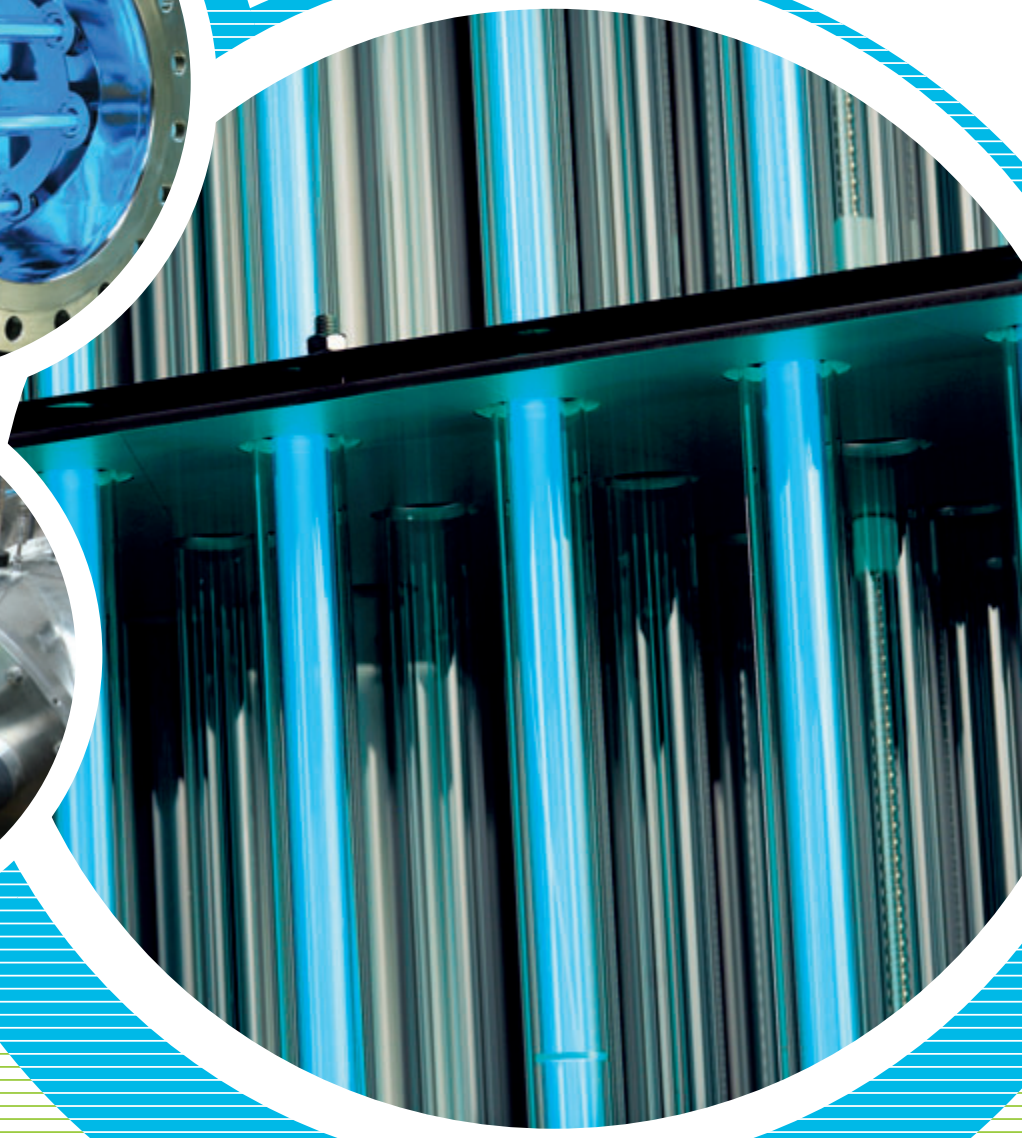


OZONIA

AQUARAY®

ULTRAVIOLET SYSTEMS

suez environnement

Degrémont

APPLICATIONS

OVERVIEW

Ultraviolet (UV) disinfection is environmentally safe and recognized as highly effective on a wide range of pathogens, including viruses. For the past 20 years, Aquaray® UV disinfection systems have been used successfully to eliminate hazardous and environmentally unacceptable chemicals such as chlorine and other associated disinfection by-products. Ozonia North America offers UV products for municipal wastewater, municipal drinking water and industrial applications.

OZONIA

Part of the Degremont group of companies and recognized for technical superiority, Ozonia's mission is to be the global leader in the application of disinfection and oxidation alternatives to meet the needs of the industrial and municipal markets. Ozonia designs and manufactures a wide range of Ultraviolet and Ozone equipment incorporating the most sophisticated electronics and lamp technologies available.

Our formula for success is fostering long-term customer satisfaction with technically advanced and cost-effective ultraviolet and ozone systems.

As a global corporation, human resources is one of our most important assets. At Ozonia, we continually encourage dialogue and exchange between our group companies, customers and affiliates to maintain a high level of personnel qualification in all fields.

Municipal Wastewater

To protect the environment (like rivers, streams, lakes,…) increasingly stringent regulations are being implemented to limit the release of pathogenic microorganisms. In arid areas, due to water scarcity, a part of the treated wastewater can also be used for a reuse application such as land sprinkling, golf irrigation, … Over the past 20 years, Ozonia has been providing UV disinfection systems for :

- Secondary or tertiary treatment disinfection
- CSO & SSO applications
- Reuse



Municipal Drinking Water

UV systems are used as a final barrier in drinking water treatment plants to disinfect water by inactivating pathogenic microorganisms such as viruses, bacteria and parasites. UV-C lights are particularly effective for chlorine resistant microorganisms such as *Cryptosporidium* and *Giardia*, even at low dosages. To reduce the risk of waterborne diseases, a growing number of countries are implementing strict limits on these pathogens through new regulations.

Ozonia can always offer the best solutions combining higher efficiency and smaller footprint with low- or medium-pressure UV reactors for small to very large water treatment plants.

Industry

Ozonia provides open-channel or closed-vessel UV systems for Industrial applications for :

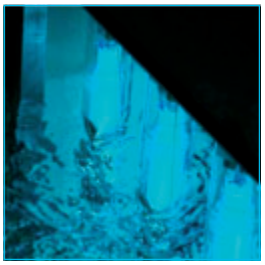
- Food and Beverage
- Electronics
- Pharmaceutical
- Cosmetics
- Aquaculture
- Cooling tower water
- Spas and Swimming pools



TECHNICAL DATA:

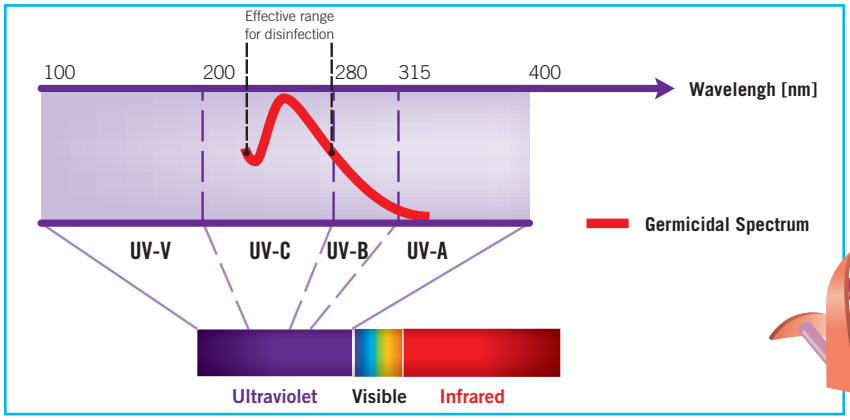
ACTION/THEORY

UV systems disinfect by inactivating pathogenic microorganisms such as viruses, bacteria and parasites which may be in the water and may cause waterborne diseases.
In the broad light Spectrum, the UV-C wavelength (200-280 nm) has been proven to be the most efficient wavelength to inactivate microorganisms by damaging the nucleic acids (DNA or RNA), which prevents the organism's ability to reproduce.
The germicidal effectiveness of a UV system depends on various factors such as UV transmission, flow rate and the applied UV dose, which is a function of the UV intensity delivered by the lamps and the exposure time in the reactor.



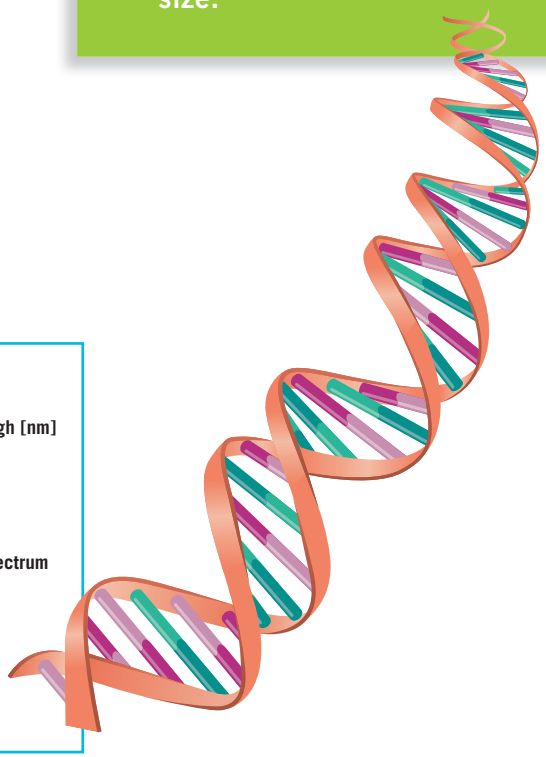
HOW DOES IT WORK?

UV-C light is created by a lamp filled with an inert gas and mercury. Electrical energy is applied to electrodes within this lamp which creates an electrical arc through the metallic vapor to generate UV radiation. Two main UV lamp technologies are available for water disinfection. Low pressure lamps have the ability to create a monochromatic radiation at 254 nm, close to the germicidal peak (264 nm). Medium pressure lamps create a broad spectrum of UV wavelengths from 200 to 300+ nm. Ozonia offers both of these powerful technologies.



Product Focus/ Performances

- → UV is chemical free and produces no measurable disinfection by-products (DBPs)
- → UV can easily inactivate, even with low UV Dose, chlorine resistant microorganisms such as Cryptosporidium and Giardia
- → UV can be part of a Multi-barrier protection strategy in addition to other disinfection methods (such as Ozone systems)
- → UV can be easily retrofitted into an existing treatment plant thanks to its compact size.

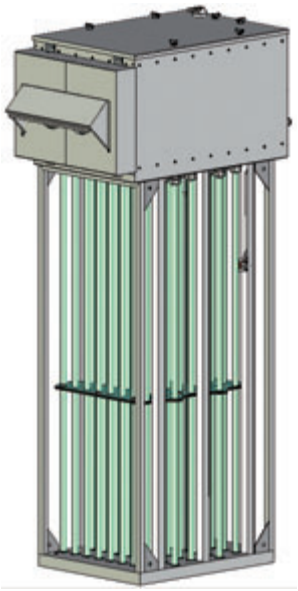


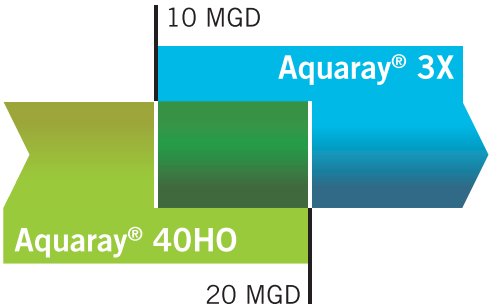
UV

PRODUCT FOCUS: AQUARAY® 40HO

Aquaray® 40HO

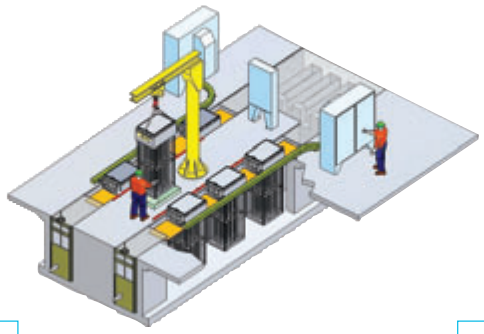
Perfect design for medium Wastewater Treatment Plants up to 20 MGD.

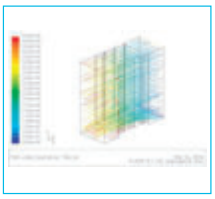


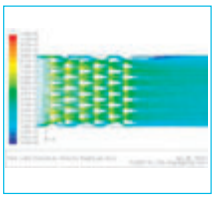


Modular Concept

Aquaray® 3X and Aquaray® 40HO modules can be installed in series and/or in parallel in multiple channels, depending on flow rates and disinfection requirements.

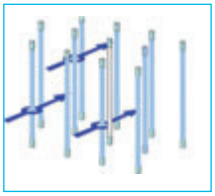






Optimized Performance

The Aquaray® 3X and Aquaray® 40HO have been optimized with CFD modeling software to maximize UV Dose and minimize head loss.



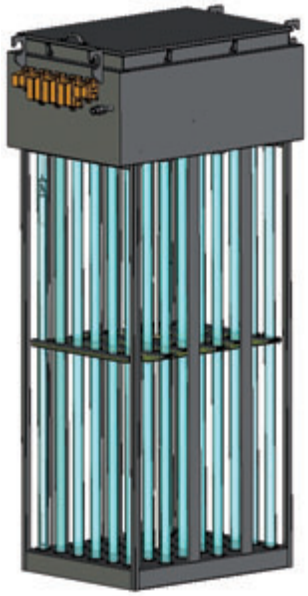
Easy Maintenance

Due to the vertical design, operators have an easy access to the UV lamps and quartz sleeves (no need to remove the UV module from the channel)

PRODUCT FOCUS: AQUARAY® 3X

Aquaray® 3X

Perfect design for large Wastewater Treatment Plants from 10 MGD and higher.



Secured Performance

The staggered vertical lamp configuration in the Aquaray dramatically enhances system performance by making it virtually impossible for an organism to by-pass the UV energy field, even if a lamp fails.

PRODUCT FOCUS: AQUARAY® SLP

Optimized Performance

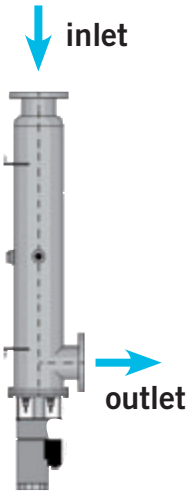
The Aquaray® SLP has been optimized with CFD modeling software to maximize UV Dose and minimize head loss.

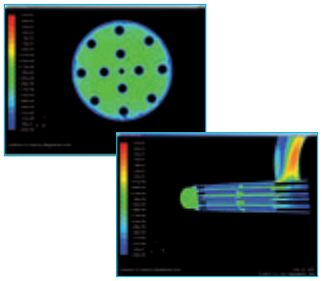
Save Space

Compare to standard LPHO reactors, the Aquaray® SLP offers between two and three times more power.

Extended Lamp Life

With the new Low Pressure extra-High Output Amalgam lamps, the Aquaray® SLP range offers a highly efficient lamp with an average lifetime of 16,000 hours.





"L" shape

The SLP designed with a new "L" shape with Inline inlet and offline outlet to optimize the hydraulic performances through the reactor. Head loss is reduced and the UV dose is maximized.

PRODUCT FOCUS: AQUARAY® H_2O

Optimized Performance

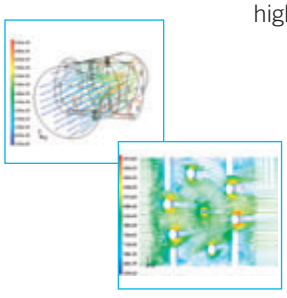
The Aquaray® H_2O has been optimized with CFD modeling software to maximize UV Dose and minimize head loss.

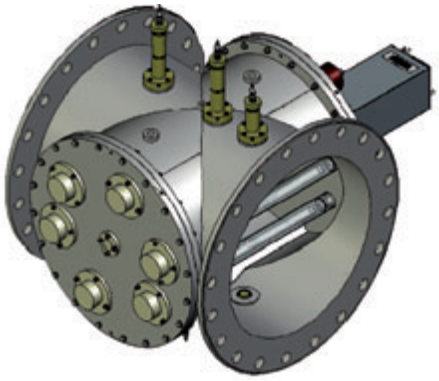
Save Space

To minimize the footprint and simplify retrofitting in an existing plant, the Aquaray® H_2O uses Medium Pressure lamps with high power density.

Validated Performance

The Aquaray® H_2O has been subjected to rigorous bioassay testing and has been third-party validated to DVGW W-294 protocol and certified per USEPA guidelines.





"Duplex" Version

By putting two reactors in series, the Aquaray® H_2O is able to treat greater flow rates or deliver higher doses.

PRODUCT RANGE

RANGE OVERVIEW - DRINKING/PROCESS WATER

MAIN FEATURES

					
	AQUARAY® LP	**AQUARAY® SLP-DW/PW**	**AQUARAY® SMP-DW/PW**	**AQUARAY® H_2O**	**AQUARAY® LPTS**
Type of reactor	Closed vessel	Closed vessel	Closed vessel	Closed vessel	Closed vessel
Installation	Horizontal & Vertical	Horizontal & Vertical	Horizontal	Horizontal	Horizontal & Vertical
Lamp technology	Low Pressure High Output Amalgam	Low Pressure High Output Amalgam	Medium Pressure High Output	Medium Pressure High Output	Low Pressure High Output Amalgam
Flow range (at 40 mJ/cm² and 95% UVT)	45 to 175 gpm	110 gpm to 6 Mgd	90 to 1,980 gpm	2 to 50 Mgd	40 to 145 gpm (at 120 mJ/cm² and 98% UVT)

MAIN APPLICATIONS

Municipal Drinking Water	**Disinfection**	**X**	**X**	**X**	**X**	-
	AOP	**X**	**X**	**X**	**X**	-
Food and beverage	**Disinfection**	**X**	**X**	**X**	**X**	**X**
	Ozone destruction	**X**	**X**	**X**	-	**X**
Aqua-culture	**Disinfection**	**X**	**X**	**X**	**X**	-
Power Generation	**Disinfection**	-	**X**	**X**	**X**	**X**
	TOC reduction	-	**X**	**X**	-	**X**
Cooling Water	**Disinfection**	**X**	**X**	**X**	**X**	-
Micro-electronics	**Disinfection**	**X**	**X**	**X**	-	**X**
	Ozone destruction	**X**	**X**	**X**	-	**X**
	TOC reduction	-	-	**X**	-	**X**
Pharama-ceutical	**Disinfection**	**X**	**X**	**X**	-	**X**
	Ozone destruction	**X**	**X**	**X**	-	**X**
	TOC reduction	-	**X**	**X**	-	**X**

RANGE OVERVIEW - WASTEWATER

MAIN FEATURES

				
	AQUARAY® SLP-WW	**AQUARAY® SMP-WW**	**AQUARAY® 4OHO**	**AQUARAY® 3X**
Type of reactor	Closed vessel	Closed vessel	Open channel	Open channel
Installation	Horizontal & Vertical	Horizontal	Vertical	Vertical
Lamp technology	Low Pressure High Output Amalgam	Medium Pressure High Output	Low Pressure High Output	Low Pressure High Output Amalgam
Flow range (at 30 mJ/cm² and 65% UVT)	40 to 1,000 gpm	90 to 2,100 gpm	2 to 3 MGD (per module)	5 to 6 MGD (per module)

MAIN APPLICATIONS

Wastewater disinfection	**X**	**X**	**X**	**X**
Reuse wastewater	**X**	**X**	**X**	**X**
Industrial wastewater Treatment	**X**	**X**	**X**	**X**
Number of Lamp	**X**	**X**	**X**	**X**
CSO & SSO	-	-	**X**	**X**

UV DISINFECTION

CLOSED VESSEL

OPEN CHANNEL

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Commited together to water, a source of life