

AOP Piloting services

AOP

Ozonía supplies containerized Advanced Oxidation Process (AOP) pilot plants which have been especially designed to evaluate and select the optimum treatment solution to remove refractory and toxic pollutants found in Municipal and Industrial water and wastewaters.

APPLICATIONS

- Micropollutants removal
- Organic pollutants removal
- Drinking water treatment
- Municipal & Industrial wastewater treatment
- Ground water remediation

MAIN CHARACTERISTICS

- Advanced oxidation technologies
- Chemical AOP's: $O_3 - O_3/H_2O_2$
- Photochemical AOP's: $O_3/UV - UV/H_2O_2 - O_3/UV/H_2O_2$

MAIN FEATURES

- Five AOP combinations available to determine the best process
- High oxidation potentials to remove all oxidizable compounds
- Containerized solution with a small footprint for easy field integration
- Fully controllable with full data collection from a user friendly computing interface
- Designed to meet a broad range of specifications and application demands

AOP PILOT SPECIFIC TECHNOLOGY

Ozonía's AOP pilot plant is designed for clients seeking validated performances for the treatment of highly recalcitrant pollutants. Equipped with an Ozonía high concentration OZAT® ozone generator and an Ozonía Aquaray® LPHO UV system, the AOP Pilot plant is able to perform and compare five AOP processes through multiple reactors with all the ancillary equipment necessary to operate and monitor the specific AOP process under study. In the Photochemical reactor, UV radiation is applied to the water saturated with ozone and/or H_2O_2 to generate hydroxyl radicals. In the Chemical reactor, H_2O_2 is dosed to the ozonated water at multiple points for complete and continuous hydroxyl formation.

The effect of the oxidation processes and the water quality is monitored by means of on-line O_3 , UVT, H_2O_2 , pH, redox potential, and offline COD measurements. Numerous sampling valves after the reactor vessels allow taking samples for ex-situ analyses throughout the treatment process.

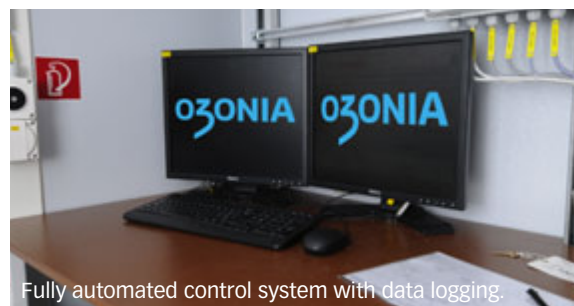
HOW IT WORKS

AOP's are aqueous phase oxidation methods consisting of highly reactive species used in the oxidative destruction of target pollutants. AOP creates a more powerful and less selective secondary oxidant, hydroxyl radicals, in the water.

This secondary oxidant can cause the oxidation of most organic compounds until they are fully mineralized as carbon dioxide and water. The hydroxyl radical has a much higher oxidation potential than ozone or hydrogen peroxide and usually reacts at least one million times faster, thus leading to a smaller contact time and footprint.



Fully integrated AOP Pilot Plant in standard 20' shipping container.



Fully automated control system with data logging.



Interior: Flexible multi-stage AOP system.

PRODUCT HIGHLIGHTS

- > High performance
- > Fully engineered system
- > On-board analytics
- > Minimum installation time
- > Compact design
- > Easy to operate
- > Full Ozonía service back-up

OZONIA

TECHNICAL DATA

PERFORMANCE DATA	FROM	TO	
Flow of process water	100	1200	l/h
UV dose	85	1020	mJ/cm ²
Ozone dose	2.25	450	mg/l
Ozone concentration	6	12	wt%
Ozone production	2.7	50	g/h
@ 6 wt%	2.7	30	g/h
@ 10 wt%	4.5	50	g/h
@ 12 wt%	5.35	40	g/h
H ₂ O ₂ dose	0	80	mg/l
Contact time	1.2	21.1	min

ON-LINE ANALYSERS

- O₃
- H₂O₂
- pH
- Redox potential
- Offline COD
- UV transmittance

TECHNICAL FEATURES

- Ambient temperature: -20°C to +40°C
- Voltage: 3 x 360...495 VAC
- Frequency: 50 / 60 Hz
- Outdoor installation

DIMENSIONS

AOP CONTAINER	DIMENSION
Weight empty	4500 kg (9,900 lbs.)
Weight in operation	5300 kg (11,660 lbs)
Width	2500 mm (98 in)
Length	6100 mm (240 in)
Height	2600 mm (102 in)
Water connections	DN 15

CONTACTS

OZONIA Switzerland	info-ozoniaCH@degtec.com	+41 44 801 85 11
OZONIA North America	info-ozonia@degtec.com	+1 201 676 2525
OZONIA France	info-ozoniaFR@degtec.com	+33 1 58 81 50 69
OZONIA Triogen	info-triogen@degtec.com	+44 13 55 220 598
OZONIA Russia	info-ozoniaRU@degtec.com	+7 831 434 16 28
OZONIA China	info-china@degtec.com	+86 10 6597 3860
OZONIA Japan	info-japan@degtec.com	+81 3 5444 6361
OZONIA Korea	info-ozoniaKR@degtec.com	+82 31 701 9036

OPERATING RANGE CHEMICAL REACTOR	FROM	TO	
Ozone dose	2.25	450	mg/l
Flow rate	1200	100	l/h
Ozone production	2.7	45	g/h
Contact time	1.2	14.4	min

OPERATING RANGE PHOTOCHEMICAL REACTOR	FROM	TO	FROM	TO	
Water transmittance	0.9		0.5		1/cm
UV dose	308	1020	85	1020	mJ/cm ²
Flow rate	1200	362	1200	100	l/h
Contact time	1.8	5.8	1.8	21.1	min
H ₂ O ₂ dose (max.)	2.2	7.4	2.2	26.7	mg/l
Ozone dose	2.25	138	2.25	450	mg/l
Ozone production	2.7	50	2.7	45	g/h

CLIENT SUPPLY

- Water
- Electricity

SCOPE OF SUPPLY

- Chemical and Photo-chemical AOP reactors
- Ozone generation system
- Oxygen generation system
- Vent ozone destruction system
- LPHO UV system
- Hydrogen peroxide injection systems
- pH control system
- Water pump
- Water chiller for process and equipment cooling
- Control room equipped with industrial computer (for plant operation and data logging)

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