Air Liquide creative oxygen | nexelia

Tertiary Treatment

We deliver:

- Turn-key ozone treatment
- Water disinfection
- Removal of non-readily biodegradable pollution
- Oxygen re-use
- Effective sludge treatment

The Industry Challenge

Wastewater treatment has become a major concern. In some regions, water is scarce, and environmental protection is a growing necessity. As a result, the industry needs reliable and cost-effective technologies to comply with today's strict regulations regarding wastewater discharge.

If you're looking to meet stricter or new regulatory discharge limits, in a cost effective manner, industrial gases can provide you with a truly effective solution.

Your Solution

A comprehensive gas solution designed for and adapted to your specific needs, **Nexelia™ for Tertiary Treatment** combines the best of our gases, application technologies and expert support. As with all solutions under the Nexelia™ label, we work closely with you to pre-define a concrete set of results, and we commit to delivering them.

Nexelia™ for Tertiary Treatment is an all-in-one gas solution, using ozone (O_3) to remove pathogenic organisms or pollutants which are difficult to biodegrade like micro-pollutants (pharmaceutical and personal care product residues), surfactants, inks, etc.

Ozone is one of the most powerful and readily available oxidizing agents. The excess oxygen (O_2) to produce ozone is re-used to optimize the overall solution and lower costs.

Nexelia™ for Tertiary Treatment is suitable for municipal or industrial wastewater treatment plants.

Your Advantages

▪ Removal of non-readily biodegradable pollution

Degradation of complex chemical molecules to meet effluent discharge limits.

▪ Removal of micro-pollutants

Compliance with the newest and strongest regulations, particularly targeting micro-pollutants (Contaminants of Emerging Concern).

Ozone breaks down very rapidly, leaving no residual traces. Ozone dosages are precisely adjusted not to produce any toxic transformation products.

▪ Detoxication

Detoxication of influent is indispensible if wastewater is toxic for microorganisms in biological treatment steps. Ozone converts toxic substances into biologically harmless ones.

▪ Disinfection

Ozone is a superior disinfectant, acting more rapidly and completely than other common disinfecting agents.

Ozone is generated on-site, and thus, there are fewer safety problems associated with shipping and handling of chlorine based chemicals.

▪ Discoloration

Removal of hard-to-treat dyes and chemicals to meet safe levels of discharge to the environment. Treated water can also be re-used in process line for cost reduction.

Core Features

Nexelia™ for Tertiary Treatment consists of:

- **Oxygen supply:**

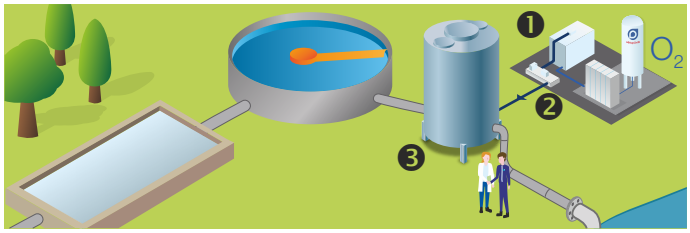
From liquid storage or in low-pressure gaseous state from on-site production generators possibly combined with ozone production.

The ozonation process is optimized thanks to the possibility to re-use the excess of oxygen and ozone in a biological step, thus improving the sludge settling and reducing the excess sludge.

- **Application technologies:**

-For ozonation

The **OZONATION UNIT** consists of three different modules: ozone production unit (❶), injection and pumping unit (❷), reactor (❸).



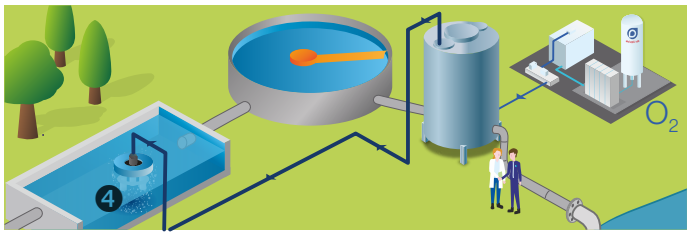
The equipment design is always based on pre-analysis that are carried out by water treatment specialists to determine the optimal ozone dosage that meets discharge limits.

INJECTOR-BICONE is the best option for a small scale ozone reactor.

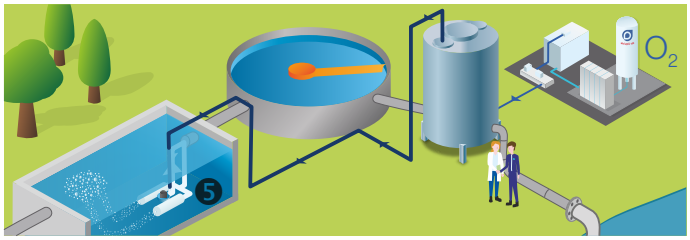
-For oxygen (O_2) reuse

The oxygen-rich off-gas from the **OZONATION UNIT** can be recovered at atmospheric pressure and re-used to cut cost by making up for oxygen injection in upstream or downstream biological basins using the patented **TURBOXAL** (❹) or **VENTOXAL** (❺).

The **TURBOXAL** is a floating turbine mixer transfer system designed for treating low biodegradable pollution in biological basins and lagoons.



The **VENTOXAL** is an immersed pumping and venturi transfer system designed for treating varying levels of pollution in all kinds of wastewater basins.



All systems are installed quickly and easily.

You benefit from full support of our water treatment experts, from the auditing of your current aeration system capacity to the preliminary and detailed designs, as well as the complete implementation in just a few days, which includes commissioning, monitoring and maintenance.

Case Study

- **Customer need: removal of micro-pollutants in municipal wastewater treatment plant**
  - — City of 350 000 inhabitants
  - — Wastewater intake: 102 000 m^3/day

- **Our solution: treatment of complete effluent with ozone**
  - — Oxygen- rich off-gas re-use from the ozone reaction for the biological treatment
  - — Inherent detoxication and reduction of germs

- **Benefits:**
  - — Meet new regulations effective 01/01/16 in Switzerland
  - — 12% OPEX savings vs. air
    - Energy savings:
      - Cooling the O_3 generator with liquid oxygen vaporization
      - 2.5 kg O_2 off-gas re-use saves net 1 kWh power for aeration
    - Process optimization by re-using excess O_2 and O_3
      - Better sludge settling: Sludge Volume Index (SVI) down to 80 ml/g
      - 30-60% excess sludge reduction

Related Offers

- **Nexelia™ for Biological Treatment**
- **Nexelia™ for pH Control**

Contact Us

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Air Liquide
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The world leader in gases, technologies and services for Industry and Health, Air Liquide is present in 80 countries with approximately 66,000 employees and serves more than 3.6 million customers and patients.