

# pH Control



## The Industry Challenge

There are many processes which, as a consequence of routine operation, generate highly alkaline i.e. high pH wastewater.

Environment agency guidelines state that buffer storage or balancing tanks should normally be provided to cope with the general variability in flow and composition of wastewater, or to provide corrective treatment like pH control.

## The Nexelia Solution

**Nexelia for pH Control** is an all-in-one gas solution from Air Liquide which can solve the problems inherent with a mineral acid using process. It encompasses everything from gas to dissolution systems for use of carbon dioxide (CO<sub>2</sub>) for pH control of wastewater.

Nexelia for pH Control consists of:

- Carbon Dioxide (CO<sub>2</sub>) supply
- Service and process expertise
- Application technologies

**Nexelia for pH Control** is suitable for municipal or industrial wastewater treatment plants.

## Your Advantages

### • Environmentally friendly operation

CO<sub>2</sub> is a recycled product and does not produce saline residuals such as sulphates and chlorines.

### • Natural safety net

Thanks to a natural buffering effect, CO<sub>2</sub> cannot reduce effluent pH far below 6, even if overdosing occurs.

### • Improved process control

pH drop with CO<sub>2</sub> occurs more gradually than with mineral acids, making accurate control inherently easier.

### • Cost effective

CO<sub>2</sub> is typically about the same price as sulphuric acid and half that required for an equivalent dose of hydrochloric acid.

### • Ease of handling & Improved Safety

The CO<sub>2</sub> is supplied in a pressurized system (cylinder or bulk storage) and can be stored remotely from the dosage point. The system is automated and the product is completely enclosed until mixed with the effluent, removing the risk of handling corrosive mineral acids.

Nexelia for pH Control consists of:



## Carbon Dioxide (CO<sub>2</sub>) supply:

We provide a range of gas supply options from cylinder supplies to bulk storage vessels. The CO<sub>2</sub> is supplied and stored at elevated pressures and can be distributed easily and safely around a site in a designed pipe work distribution system to suit individual sites requirements. These installations will be professionally assessed by our engineers to ensure compliance with all of the latest safety standards and specifications.



## Process Expertise:

You will benefit from the full support of our water treatment experts to include:

- The auditing of your current system capacity
- Preliminary and detailed designs
- Complete implementation, including commissioning, monitoring and maintenance



## Application Technologies:

Through the use of our gas control cabinets, we offer the following Nexelia solutions:

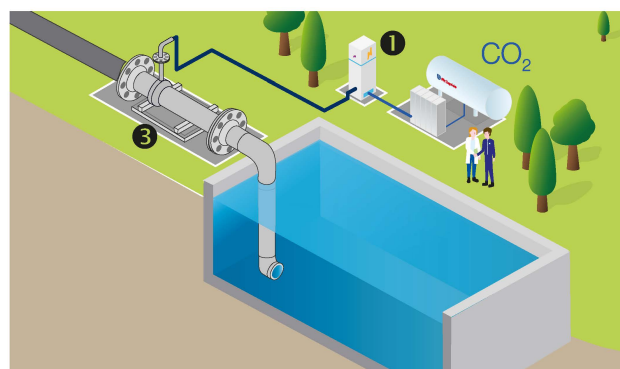
- Injector-Bicone
- CS-Nozzle
- Injector Poroxal
- CO<sub>2</sub> Injector-lance

## Application Technologies in detail:

- The **GAS CONTROL CABINET (1)** is a valve train unit, which is suitable for gas injectors to control electrical motors up to 22 kW / 45 A when required and a dosing system to inject up to 200 kg/h.

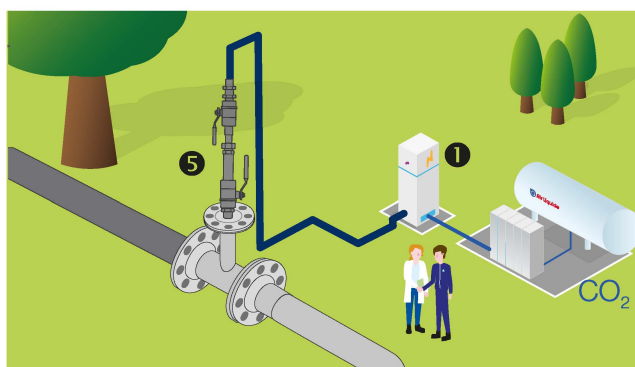
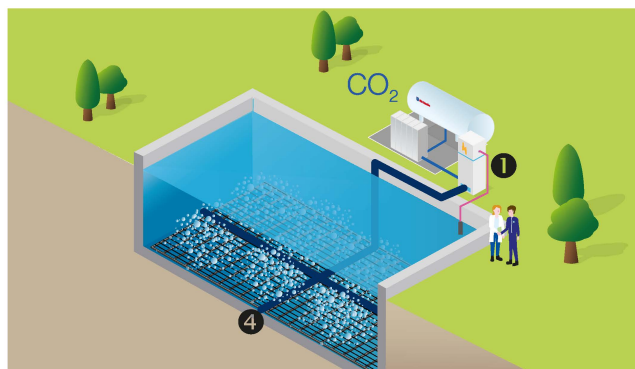
- The **INJECTOR-BICONE (2)** is able to solubilize CO<sub>2</sub> into water at saturation limit. It is very efficient in process water where the gas solubility is limited by operating conditions (e.g. temperature > 40°C), and the best option when CO<sub>2</sub> has to be dissolved in a wastewater flow with high calcium content.

- The **CS-NOZZLE (3)** is a CO<sub>2</sub> injection system based on a pressure drop from 0.5 to 1.2 bar which results in an expansion – dispersion effect to mix water and gaseous CO<sub>2</sub>



- The **INJECTOR-POROXAL (4)** is a ground injection system made of perforated holes and immersed in biological basins for CO<sub>2</sub> injection. It works without electricity for gas injection or any other power source unless an impeller is added to enhance the medium circulation. The **INJECTOR-POROXAL** is the best option in static basins.

- The **CO<sub>2</sub> INJECTOR-LANCE (5)** is designed for pressurized streams of water in pipelines. A nozzle is mounted at its tail end to generate small gas bubbles and dissolve CO<sub>2</sub> into the water



## Case Studies

### Case study #1: Beverage industry

- **Customer need: fix corrosion of piping system and bad smell**
  - pH adjustment in washing water from plastic bottles recycling
  - Wastewater intake: 120 000 m<sup>3</sup>/a
- **Our solution:**
  - Replacement of sulfuric acid by CO<sub>2</sub>
- **Our Benefits:**
  - Reduction of sulfate load
  - Prevention of fines
  - No legal dispute with neighborhood

### Case study #2: Chemical industry

- **Customer need: compliance with stronger regulation**
  - pH decrease from 12.8 down to a maximum value of 9.0
  - Wastewater intake: 200 000 m<sup>3</sup>/a
- **Our solution:**
  - Pre-treatment of partial flow with CO<sub>2</sub>
- **Our Benefits:**
  - Preservation of operation permit

Want to find out more?  
Get in touch!



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