

Remineralization

We deliver:

- Compliance with food and beverage requirements
- Fine pH adjustment
- Stabilization of hardness value
- No hazardous saline residues
- Energy saving solution
- A reliable turnkey solution



The Industry Challenge

The largest use of carbon dioxide (CO₂) for potable water treatment is for remineralization. This application is used for hardening of either naturally soft waters or waters that have been softened during the treatment process, through nanofiltration or reverse osmosis. Water hardness levels are a requirement of standards for potable water.

Following desalination, water's mineral level becomes very low. It must therefore be remineralized in order to reincorporate the elements that make it drinkable and non-corrosive.

Adding lime or limestone along with an acid is an essential step in remineralization. And using CO₂ is an almost mandatory standard in this process.

The Nexelia Solution

A comprehensive gas solution designed for and adapted to your specific needs, **Nexelia for Remineralization** 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 predefine a concrete set of results, and we commit to delivering them.

Nexelia for Remineralization is an all-in-one gas solution, which provides process expertise on system design, and equipment for safe and effective carbon dioxide dissolution into the water. It encompasses everything from the most suitable liquid CO₂ supply, dosing and control cabinet, and static mixers or injection systems in pipe-in-pipe or bypass modes.

Your Advantages

- **Compliance with strict regulatory standards**

Carbon dioxide product compliance with the latest International Society of Beverage Technologists (ISBT) guidelines, the European standard EN936 and local regulations.

Carbon dioxide supply chain compliance with the Air Liquide Food Safety Management System.

- **High efficiency**

Our engineering design and the suitable injection and mixing equipment achieve high CO₂ solubility above 95%.

- **Accurate pH control**

Whereas small quantity of strong acids - like sulfuric acid - can change pH dramatically, a weaker-acid CO₂ offers very accurate pH control.

- **Better organoleptic quality of water**

Soft water tastes salty and is not suitable for drinking. Water hardening is necessary to add minerals like calcium and magnesium, which makes water suitable for drinking not only because of health benefits, but also for better flavor and taste.

- **Less corrosion and scaling**

Carbon dioxide massively reduces corrosion in equipment and piping that is caused by strong acids, therefore savings on maintenance. Additionally, CO₂ is much safer to handle compared to strong acids.

• Eco-responsible operation

Carbon dioxide is a recycled product and does not produce residuals as sulphate and chlorine. And an increasing number of green sources are available today.

• Reliability

We provide peace of mind in supplying reliable CO₂ supply and maintenance to prevent from critical desalination plant interruption. Furthermore, we offer modular solutions to increase treatment capacity as desalination plants ramp up over the years.

Core Features

Nexelia for Remineralization consists of:

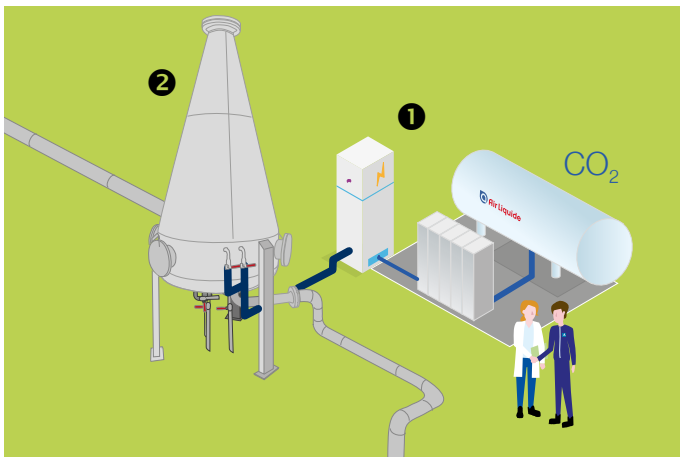
• Food grade (CO₂) supply

We provide a range of gas supply options from bulk storage vessels through to cylinder supplies. In addition, we can supply liquid CO₂ vaporization and control equipment. Because CO₂ is supplied and stored at elevated pressures, it can be easily and safely distributed around a site in a designed pipework-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.

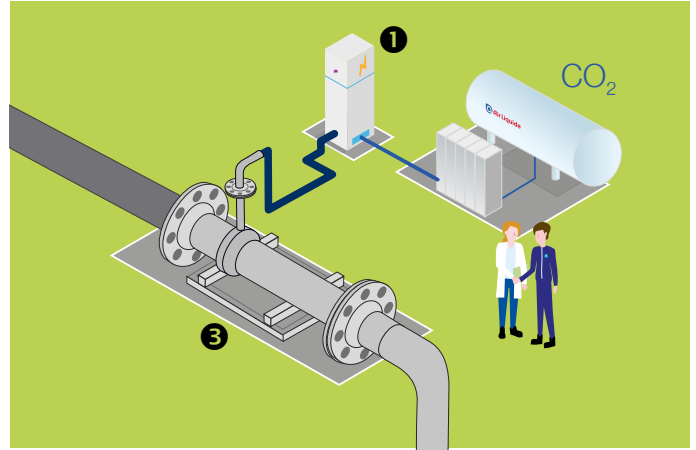
• Application technologies

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

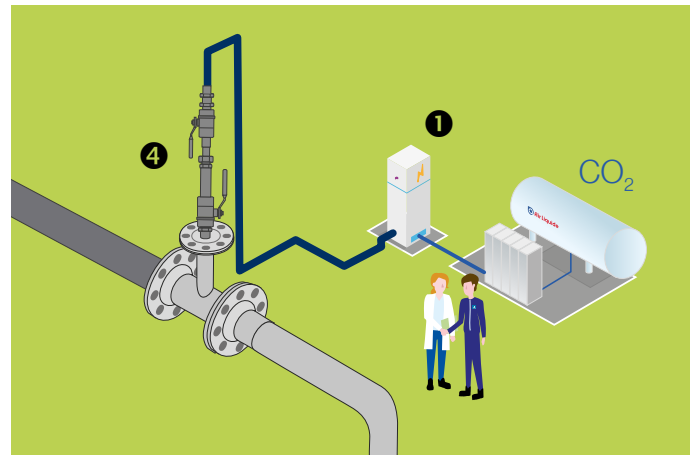
- The **INJECTOR-BICONE (2)** is able to solubilize CO₂ into water up to saturation limit.



- The **CS-NOZZLE (3)** is a CO₂ 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 CO₂.



- **CO₂ INJECTOR-LANCE (4)** is the best option to dissolve carbon dioxide in large pipes (e.g. 1.2 m diameter) of pressurized water streams



All systems are installed quickly and easily. The **GAS CONTROL CABINET** is placed close to the point of injection and can be operated either as a stand-alone system or integrated into your process control system. It contains all safety and emergency functions.

You benefit from full support of our watertreatment experts, from the auditing of your current 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 Studies

CASE STUDY #1: water purification plant

- **Customer need: pH adjustment to protect a pipeline network from corrosion**

- Surface water intake: 250 000 m³/day

- **Our solution: CO₂ addition before lime water dosage**

- CO₂ dosage: 15-30 mg/l (seasonal variations)

- Liquid CO₂ vaporizer is installed in the pure water chamber

- **Benefits:**

- CO₂ and lime create hydrogen carbonates which further create a fine layer on the inner piping surface that protects against corrosion

- Stable hardness value of 16 mg/l Ca

- Fine pH adjustment of 8.4 at plant outlet

- No energy consumption for CO₂ vaporization

CASE STUDY #2: drinking water station

- **Customer need: pH and alkalinity control**

- Surface water intake: 138 000 m³/day (two lines)

- **Our solution: pipe-in-pipe injection of liquid CO₂ in a pre treatment chamber**

- CO₂ dosage: 25-70 mg/l (5°C – 25°C)

- By-pass injection

- **Benefit:**

- Liquid CO₂ enables high CO₂ flow rate with low power requirement

- Alkalinity: 20-90 mg CaCO₃/l

- Stable hardness value of 20 mg/l Ca

- Fine pH adjustment from 7.7-9.5 (initial) to 7.5 (final)

CASE STUDY #3: desalination plant

- **Customer need: compliance with drinking water standards**

- Water production: 20 000 m³/day

- Calcium source: lime milk

- Hardness requirement: 6°fH-8°fH depending on RO operating conditions

- **Our solution: porous diffusers down an 8 m deep basin**

- CO₂ injection: 60-70 kg/h

- PID control with pneumatic valves

- **Benefit:**

- Good calco-carbonic balance meeting the carbonate concentration requirements for potable water.

- Fine pH adjustment

- No scaling or corrosion

Related Offers

- **Nexelia for Water Purification**

- **Nexelia for Groundwater**

Contact us

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