Cooling Water: CO_2 for anti-scaling

We deliver:

- Safer operations
- Corrosion risk-free
- Lower maintenance costs
- No hazardous residuals

The Industry Challenge

Water used to cool industrial process needs to be constantly monitored to avoid scale, biological growth, corrosion and sludge impacts. When scaling occurs, the thermal performance of your heat exchangers drop and the risk of biological growth rises. This could increase biological corrosion and sludge deposit, causing leakage and pipe narrowing.

Handling those challenges corresponds to an important share of your cooling towers operational costs. Air Liquide proposes a more cost efficient solution using CO_2 to attend your needs.

Air Liquide developed a specific know-how on CO_2 injection in cooling circuits for demanding customers such as nuclear power plants or hyperscale data centers.

The Nexelia Solution

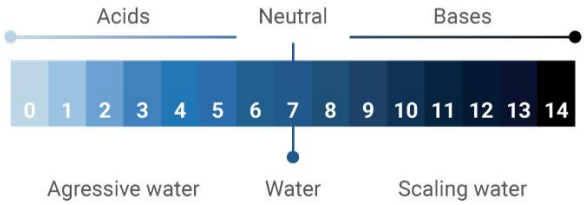
A comprehensive gas solution designed for and adapted to your specific needs, **Nexelia for Cooling Water** combines the best of our gases, application technologies and expert support. As with all solutions under the **Nexelia** label, we work closely with you to predefine a concrete set of results,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

Nexelia for Cooling Water is an all-in-one gas solution designed to avoid or to remove scale. The preventive treatment consists in regulating pH and water hardness to maintain the calco-carbonic equilibrium in neutral conditions to inhibit scale formation. If scale is already present, the corrective treatment is done by overdosing temporarily the CO_2 which creates aggressive conditions in order to dissolve existing scale. Both solutions are simple and do not require to stop your cooling circuit to improve it.

Your Advantages

• Safer Operations

Carbon Dioxide will simplify the management of the cooling water by decreasing the risks linked to the manipulation of strong mineral acids. CO_2 is inert and doesn't require dosing pumps.



• Corrosion risk-free

Thanks to a natural buffering effect, with CO_2 it is technically impossible to overshoot the targeted pH making it the best option to avoid corrosion of your cooling circuit.

• Lower maintenance costs

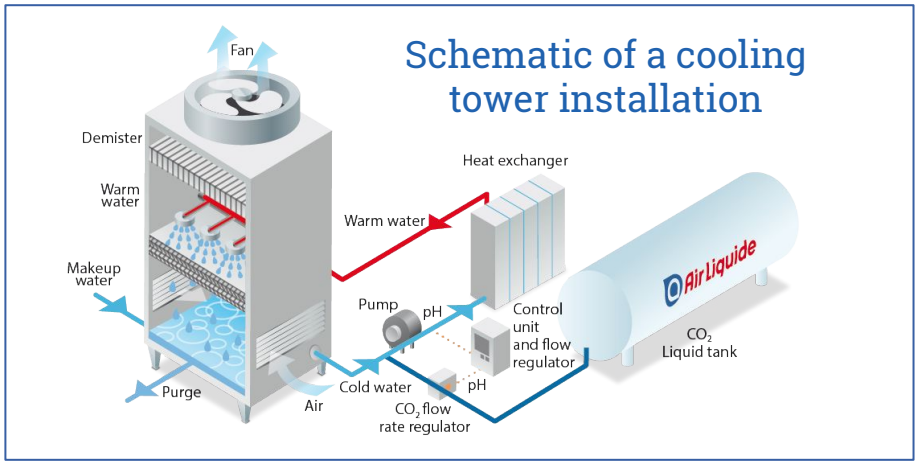
With CO_2 Air Liquide patented system, the operational costs including maintenance, are lower compared to installations using mineral acids.

• No hazardous residuals

The use of mineral acids leads to the formation of by-products such as sulphates and chlorides. With carbon dioxide, the secondary pollution is avoided, ensuring compliance with the emission levels required by authorities.

• Cooling circuit audit

To optimize the global efficiency of cooling circuits, Air Liquide offers a complete approach from defining the quantity of CO_2 needed to a final improvement on safety, processes performances and environmental impacts.



• On-site tests

To validate the design of the industrial solution and evaluate the global benefits, on-site tests can be performed without stopping existing installations. This phase will allow to measure the estimated performances.

Core Features

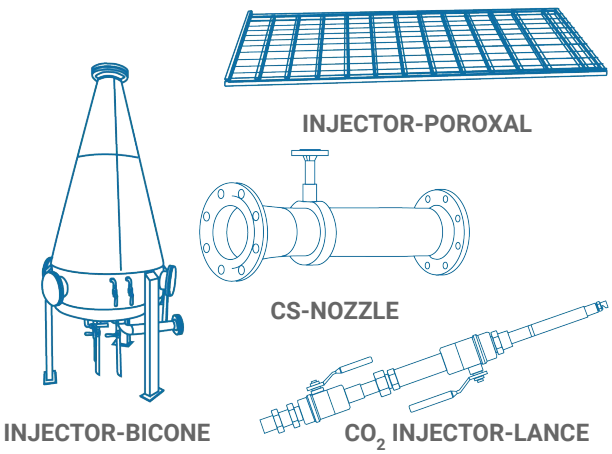
Nexelia for Cooling water consists of:

• Carbon Dioxide (CO_2) supply

We provide a range of gas supply options from bulk storage vessels through cylinder supplies. In addition, we can supply liquid CO_2 vaporization and control equipment. Because CO_2 is stored under pressure, it can be easily and safely distributed around a site in a designed pipe work distribution system to suit individual sites requirements.

• Application technologies

The INJECTOR-BICONE, CS-NOZZLE, CO_2 INJECTOR-LANCE or INJECTOR-POROXAL are recommended for your process. Please check our equipment catalog for additional information.



You benefit from full support of our water treatment 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: Cooling water for data center expansion

• **Customer need:**
- Avoid mineral acids handling
- Accurate scale and corrosion control
- Reduce water consumption and environmental impact
- Cooling water flow per tower (30 in total): 150 m³/h

• **Our solution :**
- Line injection of gaseous CO_2
- No extra equipment needed
- CO_2 flow: 35 t/y on each cooling tower

• **Benefits:**
- Increase recycle rate from 3 to 5, leading to water savings, while avoiding any deposit risk
- 44% reduction of cleaning chemicals
- 67% reduction in mechanical cleaning

CASE STUDY #2: Geothermal power cooling water

• **Customer need:**
- Avoid breakdowns and reduce maintenance
- 1 production line with 2 heat exchangers and 1 turbine for energy
- Average process water flow: 650 m3/h

• **Our solution:**
- Line injection of gaseous CO_2 with specific nozzle and dosing panel
- No extra equipment needed
- CO_2 consumption: 100 t/y

• **Benefits:**
- No power loss during operation
- Reduction of maintenance costs, increase maintenance intervals
- No mechanical cleaning needed

Contact us

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