

Cooling Tower  
Water Disinfection



Municipal



Bielefeld,  
Germany

# Cooling Tower Water Disinfection at Bielefeld, Germany

## Managing Legionella and Algae in Cooling Water

The City of Bielefeld, Germany provides municipal utilities including electricity, natural gas, district heating, and water needs for a population of approximately 330,000. The municipality operates three gas-fired boilers with tapping turbines to feed into the district heating system that has a thermal peak load of 300 MW.

Cooling water from generators, oil coolers, and sampling coolers are re-cooled via two open-evaporation cooling towers with a total capacity of 2,500 m<sup>3</sup>. Historically, the municipality has used chlorine dioxide to manage Legionella and algae blooms in their cooling water; unfortunately, a sustainable genetic content of less than 100 cfu has not been consistently maintained, especially in autumn and winter, when cooling tower swathes pull through the factory's internal road.

With the new stringent regulations governing the control of microbiology<sup>1</sup> and guidelines for plant operation<sup>2</sup>, the municipality required a new disinfection method to minimize biofilm growth, biofouling, and Legionella in their cooling water.

## The Solution

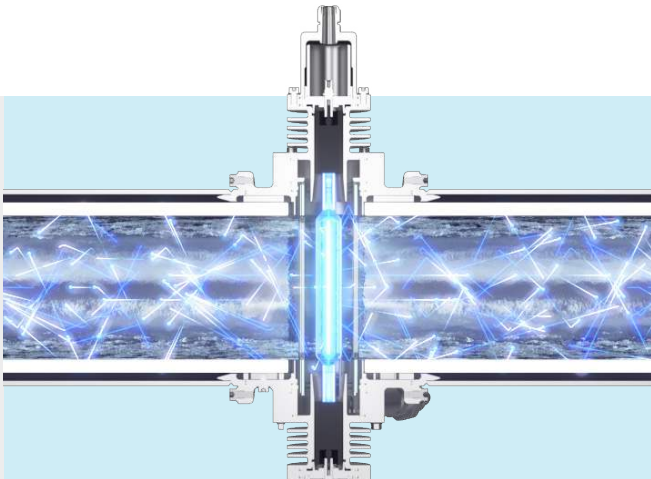
Atlantium's HOD™ (Hydro-Optic Disinfection) UV treatment system, an environmentally friendly disinfection method that reduces the use of chemicals and chlorination cycles, was installed in February 2018.



The HOD UV RZB Series was installed as a bypass on the existing 300 mm (12") piping and water was returned to the cooling towers, accommodating a flow rate of 250–400 m<sup>3</sup>/h (1,100–1,761 gpm), as a cost-effective and efficient method of reducing biofilm and providing effective treatment for inactivating Legionella.

1. 42. BImSchV, the inspection requirements for evaporative cooling systems, cooling towers, and wet separators
2. VDI Guideline 2047-2, securing the hygienically sound operation of evaporative cooling systems

**Atlantium HOD systems** effectively inactivate pathogens by combining ultraviolet water disinfection technology with hydraulic and optic principles. The HOD UV system features the unique Total Internal Reflection (TIR) technology that recycles UV light energy, ensures homogenous UV dose distribution, provides superior power (kW) efficiency compared to traditional UV, and achieves unprecedented micro-organism inactivation.



## Results

Initial disinfection results for the HOD UV technology are very promising, bacteria counts have been drastically reduced and Legionella is non-detectable following the use of the system.

Additionally, Legionella levels are reducing in time due to the “cleaning” effect of the HOD UV technology. Microbiological results, sampling, and analysis for Legionella and Pseudomonas aeruginosa are performed

by an accredited laboratory. A long-term follow-up, conducted several years after installation, shows that the system continues to deliver outstanding performance, with Legionella levels remaining below detectable limits. The municipality is pleased with the excellent microbiological results and believes the HOD UV system is an effective and sustainable solution for Legionella control.

### Bacteria reduction & elimination of Legionella

		19 Feb 18	26 Feb 18	5 Mar 18
Legionella [ /100ml]	Before HOD UV	550	100	15
	After HOD UV	0	0	0
	% Reduction	100	100	100
Pseudomonas Aeruginosa [ /100ml]	Before HOD UV	0	0	0
	After HOD UV	0	0	0

Following the introduction of HOD UV, micron filtration replacement dropped, thereby reducing costs.

## About us

For more than two decades, Atlantium Technologies has helped to ensure water safety with its innovative HOD™ (Hydro-Optic Disinfection) UV technology and novel approach to performance, monitoring, and control. Atlantium's superior, environmentally friendly water treatment solutions ensure stable, efficient, and dependable production.

With thousands of full-scale installations for leading brands in various industries globally, we're committed to consistently meeting our customers' water quality needs, ensuring pure results.

