Hycleen Industrial
Environmentally Friendly Disinfection Process for Cooling Towers
Hygienically safe cooling water is essential
It is imperative to prevent microbial contamination of the cooling water, since this condition can poses a severe threat to human health and impairs the efficiency of the cooling system.

Hazard to humans
When the cooling water is in contact with air, fine water droplets (aerosols) are formed and released into the surroundings of the cooling tower. If this vapour is infected with bacteria (e.g. Legionella), inhalation by humans may cause serious diseases.

Affecting the efficiency of the cooling system
Bacteria and other microorganisms deposit on surfaces in the cooling system and form a biofilm. Such biofilms can impair circulation and heat transfer within the heat exchanger. This loss of heat transfer is significantly greater than that due to calcification. Moreover, the biofilm provides protection for bacteria so that they can proliferate and contaminate the whole system within a short period of time.
Statutory requirements regulate the hygienic operation of evaporative cooling systems. For a long-term, trouble-free operation of a hygienic evaporative cooling system, special attention must be paid to the planning, installation and commissioning. During operation, the cooling water quality must be monitored regularly and the condition of the cooling system must be inspected.

Hygiene requirements for the design of evaporative cooling systems:
- Prevent stagnation zones
- Low-maintenance design
- Selection of non-corrosive materials (cooling tower & pipes)
- Reduce droplet emission
- Minimal exposure to light
- Possibility for complete emptying

Cooling water quality
To monitor the cooling water quality regular microbiological and chemical water testing must be performed. In case of a trend towards deterioration, sustainable measures to improve must be initiated.

Maintenance
For proper operation of the cooling system regular cleaning and maintenance work must be carried out.

The cooling tower manufacturer E.W. Gohl Ltd. relies on the environmentally friendly disinfection process Hycleen Industrial.
For an efficient and hygienically safe cooling system

With Hycleen Industrial we have developed an efficient disinfection process to secure hygienic conditions in the cooling water in the long run – without using hazardous chemicals and without harming the environment.

Hycleen Des 30
The Hycleen Des 30 disinfection unit is the heart of the system, which produces an electro-activated disinfecting solution from highly purified salt and softened water. The combination with a sophisticated measurement and control technology makes sure that Hycleen Industrial meets the highest requirements. The fully automatic process ensures a minimum of personnel expenditure to guarantee cooling water hygiene. The produced disinfectant Anolyte Neutral is not hazardous, therefore no special security requirements are necessary.

Security in the cooling water hygiene
The intelligent dosing strategies meet the highest demands on water hygiene. A volume-proportional dosing of the highly active disinfectant into the makeup water provides a consumption-oriented disinfection. The cooling system is therefore always ideally protected (also during the warm months) and an overdosage is prevented. In the partial load operation, a time-controlled shock dosing can support the disinfection.

The efficacy of the freshly prepared and thus always highly active disinfectant has been successfully proven in practice, even without pH correction of the cooling water. With Hycleen Industrial, the cooling water can be protected to the greatest possible extent from contamination with Legionella bacteria and from the formation of an undesired biofilm.

Sustainability
Cooling water is traditionally disinfected with an occasional dosing of large amounts of harmful biocides. This shock dosing is usually not very effective and the biocides are expensive, dangerous to handle and harmful to the environment.

The disinfectant Anolyte Neutral produced by Hycleen Des 30 is a non-hazardous substance and the disinfection results in minimal quantities of undesired by-products. Compared to the biocides, the input of harmful substances into the environment is significantly reduced.

Replacing your existing environmentally damaging biocides with the Hycleen Industrial disinfection process is ideal for your environmental report. Moreover, the Hazardous Substances Ordinance requires operators to check whether the use of less hazardous substances or processes is possible.
Hycleen Des 30 is a system for the on-site production of a highly active disinfectant solution (Anolyte) which can effectively combat germs in cooling water.

- Electro-activated disinfectant solution generated from high-purity salt and softened water
- Effectiveness against Legionella pneumophila successfully proved in accordance with EN 13623
- It considerably and sustainably prevents the development of bacterial resistance

**Turn-key solution**

The process measuring and control technology takes care of the intelligent dosing of disinfectant. In addition, the cooling system can be equipped with monitoring sensor technology.

- Cutting-edge sensor technology with controller
- Reliable dosing pumps
- Optional remote monitoring and data logger
Hycleen Industrial

Benefits

+ Hygiene

Highly effective disinfectant
High bactericidal effect and effective for controlling biofilms.

Intelligent dosing
Make up water is inoculated to prevent microbial contamination. Bacteria are thus disturbed in their reproducibility when entering the cooling system.

Low chance of survival
Bacteria have limited survival chances due to their oxidative destruction and therefore cannot develop any resistance.

+ Efficiency

Cooling performance
Permanently very high cooling output due to the application of intelligent disinfection. The formation of biofilm in the heat exchanger is thus sustainably prevented.

Process stability
Increased process stability due to stable cooling.

Extended lifetime
Disinfectant is pH neutral and has a good material compatibility, no microbially induced corrosion (MIC).

The high efficacy of the disinfectant, in combination with the intelligent dosage, improves hygiene condition in the cooling water and stabilizes it sustainably at a low level.

As biofilm growth is prevented, the cooling system operates with a high cooling capacity at all times. Increased energy costs and elaborate cleaning work are thus prevented.
**Environment & Safety**

**Environmentally friendly disinfectant**  
Comparatively limited load on natural water resources.

**Reduced handling of hazardous substances**  
The safety regulations needed for the Hycleen Des 30 system are comparatively very limited.

**CO₂ reduction**  
No energy-intensive production and transport of biocides.

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**Costs**

**Inexpensive disinfection**  
In comparison to conventional disinfection with biocides, significantly reduced operating costs are achieved.

**Fully automated system**  
Easy handling, minimal use of personnel, reduced cleaning effort on the cooling system.

**Energy savings**  
The cooling system is highly efficient. Reduced thermal transfer in the heat exchanger due to biofilm is prevented.

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On-site production with high-purity salt minimizes the exposure of humans and the environment to hazardous substances. Furthermore, greenhouse gas emissions caused by the manufacture, production and transport of biocides are prevented.

Using the fully automatic on-site production of the disinfectant the running costs for the disinfection can be frequently significantly reduced. The investment in the system equipment regularly pays off in the shortest possible time.
GF Piping Systems

Worldwide at home

Our sales companies and representatives ensure local customer support in over 100 countries.

www.gfps.com/hygiene