



**eVOQUA**

WATER TECHNOLOGIES



## **STRATEGIES AGAINST LEGIONELLA**

**WITH CHLORINE DIOXIDE AGAINST BIOFILMS AND MICROORGANISMS IN DRINKING WATER INSTALLATIONS AND POOLS**



## LEGIONELLA ARE WIDELY SPREAD

### OCCURENCES

Legionella are rod-shaped bacteria that exist mainly in stagnant and warm water (30 °C - 45 °C) and that are killed only at temperatures above 60 °C. Warm water and air conditioning systems as well as water pipe systems that are not regularly used (stagnation pipes) provide ideal reproduction conditions for legionella. They can become dangerous to human beings when aerosols from a water source, such as in showers, whirlpools or via air conditioning systems, being contaminated with legionella bacteria, are breathed in. According to estimations of the Robert-Koch-Institute (RKI) in Berlin between 6.000 and 10.000 people in Germany catch the legionnaire's disease each year. The incubation period is between two and ten days. The symptoms are similar to those of a severe pneumonia. When diagnosed correctly and in time this lung disease can be treated efficiently with antibiotics.

Recurring reports on infections show the importance of prevention and control measures especially in public facilities. Wherever large water systems are used, legionella may occur. Affected are: hospitals, swimming pools, care homes, military barracks, schools, sports facilities, hotels, air humidifiers, fountains, water features, whirlpools and cooling circuits.

### CAUSES ARE:

- Irregularly used water systems (or longer periods of no use at all)
- Pipe systems with extended stagnation periods in used pipes
- Insufficient insulation (separation of cold and warm water)
- Corrosive pipes
- Materials supporting the formation of biofilms

Legionella always reproduce where water moves slowly or not at all and where warm temperatures prevail. In addition, deposits in pipe systems caused by corrosion or biofilms are regarded as ideal "nestling places". This make special precautions necessary.

### Evoqua recommends chlorine dioxide

Ideally preventative steps are taken for the control of legionella bacteria. Due to legal regulations, operators of public facilities are especially under obligation.

Because of this they not only act responsibly but also are on the safe side: It is easier to prevent Legionella than to control. Once legionella bacteria have been found, extensive measures need to be taken. This also includes a change in operation measures. Acting in advance instead of reacting will save time and money in the long run and gains the confidence of customers, guests and users.

## CHLORINE DIOXIDE BENEFITS

- Inactivation of legionella
- Decomposes biofilms (the basis for existence of legionella)
- Prevents formation of biofilms
- Has oxidising and odour-controlling effects
- Reduces formation of potentially carcinogenic haloforms
- Low operational costs
- Lower energy costs than thermal treatment
- No additional hard water lime scaling at heat exchangers and fittings
- Reliable measurement and control systems available
- Introduced in line with the German Potable Water Act

## CHLORINE DIOXIDE IN POOLS

If the fresh feed water is treated with chlorine dioxide, fewer trihalogenmethanes (THMs) will be formed. By pre-disinfection the number of germs introduced with refilling water is minimized. In addition, possible germicidal infestation of the filter can be prevented through the use of chlorine dioxide by adding to the back wash water. If legionella infestation is already detected the further treatment is recommended:

### Operational measures

If legionella have been found at certain taps (showers, taps) the complete pipe system including the fittings and the warm water tank have to be checked for its condition and materials, including seldom used branches.

### Thermal treatment

Thermal treatment of the complete water system is actually frequently applied as a measure for the control of legionella bacteria, but often it is not effective and can cause additional problems. For the destruction of legionella bacteria, the water temperature in the entire pipe system including all taps should be increased to over 65 °C for at least 3 minutes. This is difficult or even impossible in complex pipe systems and when using certain plumbing materials. It means a lot of work and high operational costs as well as resulting in possible damage by thermal stress for the materials.



DIOX-A 10 CHLORINE DIOXIDE GENERATOR

## SERVICE/ADVISING TECHNICAL SOLUTIONS

Our disinfection specialists will advise you world-wide concerning the use and metering of chlorine dioxide for prevention and control of legionella. They know where and how a system has to be installed, how to monitor and control metering. Trust in the decades of experience in dealing with chlorine dioxide and ask for references in hotels, swimming pools, hospitals and care homes.

Together with you, we will analyse which measure is the most effective for your warm water system for the long-term prevention and control of legionella. Wherever maintenance and service is required for the reliable operation of Wallace & Tiernan® products, a worldwide network of trained specialists is available. Backed by extensive stocks of spare parts in our business centres, and with all service representatives, we can also guarantee reliable and fast delivery of original spare parts.



# PREVENTING LEGIONELLA

## OPERATORS ARE UNDER OBLIGATION

In all kinds of drinking water microorganisms appear in low concentration. To keep drinking water installations in hygienic safe conditions preventive tasks are requested to defend unexpected incidents and permanent contamination. Due to legal regulations, operators of public facilities are especially under obligation. With preventive tasks they not only act responsibly but also are on the safe side: Legionella are easier to prevent than to control. Once legionella bacteria have been found, extensive measures need to be taken including operational measures. Acting in advance instead of reacting will save time and money in the long run and ensures the confidence of customers, guests and users.



Auf der Weide 10, 89312 Günzburg, Germany

+49 (8221) 904-0 [wtger@evoqua.com](mailto:wtger@evoqua.com) [www.evoqua.com](http://www.evoqua.com)

Wallace & Tiernan is a trademark of Evoqua, its subsidiaries or affiliates, in some countries.

All information presented herein is believed reliable and in accordance with accepted engineering practices. Evoqua makes no warranties as to the completeness of this information. Users are responsible for evaluating individual product suitability for specific applications. Evoqua assumes no liability whatsoever for any special, indirect or consequential damages arising from the sale, resale or misuse of its products.