

Legionella and hygiene performance

Legionella

Ill by legionella bacteria – legionnaires' disease

The legionnaires' disease is a heavy kind of the pneumonia. Mainly it affects older humans or humans with chronic diseases, which have a weakened immune system like diabetes or chronic bronchitis. Untreatedly the legionnaires' disease ends deadly in up to 70 % with humans which have chronic illnesses of the lung. The legionnaires' disease was diagnosed for the first time in the year 1976 on the occasion of a conference of former career soldiers (American Legion) in Philadelphia. It was found as independent illness, after several conference members got sick with a untypical pneumonia and some of them died. The legionnaires' disease is world-wide prevalent.

Increasing legionella population and disease transmission

The exciters of the legionnaires' disease are bacteria, which are called Legionella bacteria. They find and increase in warm fresh water, in drinking water systems, air conditioning systems and air humidifiers. Over sputtered water e.g. with showering, the exciter is inhaled and arrived so into the lung. Particularly strongly legionella bacteria increase at a temperature between 30 and 45 degrees, as they are in warm-water systems of hotels, swimming pools or schools. If the water is heated up to at least 60° C, the Legionella bacteria die in shortest time. In cold water they do not increase - but also they do not die.

Endangered system areas and objects

Special danger of a legionella increasing exists in standing warm water lines, in which over longer time no water is taken. So for example in hotels, whose rooms are not regularly inhabited. The endangered water lines also can be warm water lines with branching which have no circulating line. Also they can be chilled water lines, whose water temperature warms up by the wall temperature or warm water lines in a nearly proximity.

In warmer countries e.g. Spain, newspaper reports more often refer that in summer heat there are also critical high legionella population were found in cold water lines.

Legionella reduction with the new circulation

With the inclusion of the chilled water line into the circulation cycle there are used new solution methods for decreasing of the legionella population.

For the increasing of the legionella population there are needed two basic conditions:

1. A temperature range of approx.. 30 - 45 °C as well as
2. The time of some hours for to reach a critical legionella population.

New Circulation

Legionella bacteria can increase up to a critical population. The hot water tank with a temperature of at least 60 °C thereby is used as a filter for the legionella bacteria for the warm water, which is floating again into the warm water line.

In opposite to the classical circulation thereby for the first time the legionella bacteria increasing can be prevented also in cold water lines effectively with the help of the new circulation.

Endangerment by legionella bacteria

Annual number of the illnesses in Germany:

- 6,000 to 10,000 per year according to data of the Robert Koch institute*

Another source ** calls the following numbers in Germany per year:

- 1% of the population i.e. approx.. 800,000 visible and unnoticed Legionella infections
- 80 000 flu-similarly easy infections
- 9000 heavy pneumonia
- 1200- 1500 deaths

Sources:

http://www.rki.de/INFEKT/INF_A-Z/RAT_MBL/RAT-MBL.HTM?/INFEKT/RATGEBER/RAT10.HTM&1 *

<http://www.lbschule.de/Legionellen%20-%20Homepage.htm> **

<http://www.netdokter.de/krankheiten/reisemedizin/legionellose.htm>

<http://www.helmholtz-muenchen.de/fileadmin/FLUGS/PDF/Infopapiere/Legionellen2007.pdf>

Note: All indicated information and numbers are sources of InterNet and thereby they are without guarantee.

Water pollutants

With the new circulation a constant slow circulation of all piping contents takes place. With this, all pollutant substances which leaked out from the piping material (copper, lead etc.), they are carried back into the hot water tank and are mixed with its contents. Thus the pollutant concentration in the tap water reduces to a fraction of the otherwise usual values.

Just in the cold water line (preferably used for food preparation) with this system for the first time the pollutant concentrations can be reduced formidable.

For example in the morning the copper concentration in copper lines can be reduced to a fraction of the previous concentration values. In comparison there is no solution possible with classical circulation, to reduce the copper concentration in the cold water lines.