LEGIONELLA
Prevention in sanitary installations

GENERAL FITTINGS

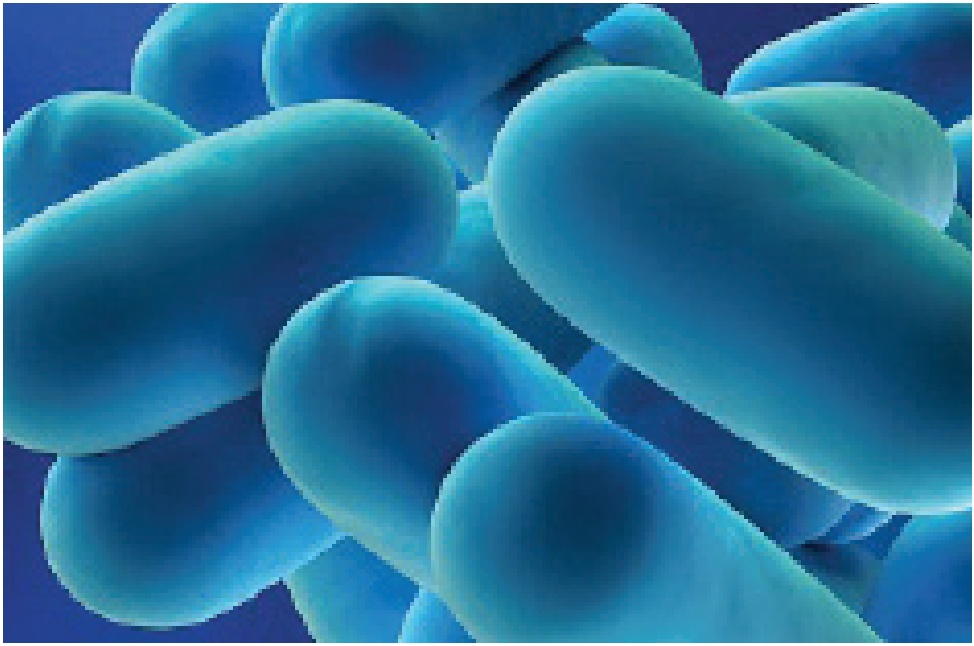
This brochure is not intended to
be a medical or scientific dissemination text.

What's **legionella?**

Legionella is a **gram-negative aerobic bacterium** of which more than fifty species have been identified: the most dangerous is the **"legionella pneumophila".**

Approximately 90% of "legionellosis" cases are attributable to this type of legionella.

It is an **infection** that mostly affects the respiratory system and can manifest itself in the form of headache, high fever, muscle pain, chest pain, disorientation and confusion.



How legionella **develops** and **spreads**

These are the main conditions that favor the **spread** of the Legionella bacteria:

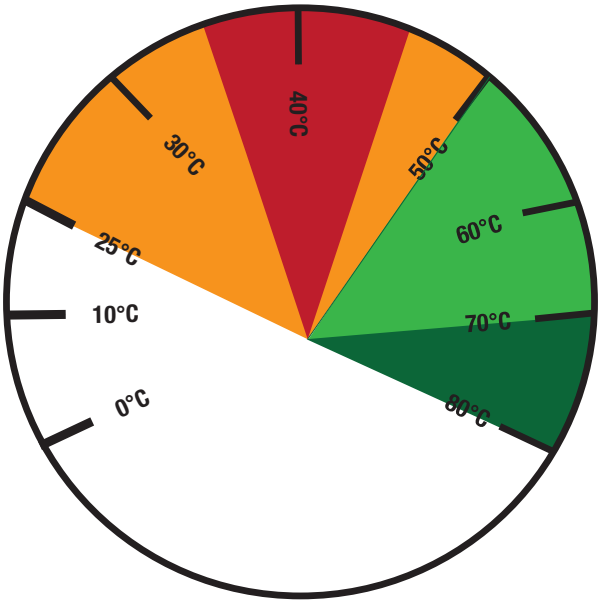
- water stagnation;
- presence of scale and sediment;
- biofilm [micro-organism aggregation];
- presence of amoebae [single-celled organisms]
- inadequate water circulation temperatures in the system

Legionella is one of the bacteria that is most commonly found in sanitary water distribution networks. The infection is mainly contracted through the **inhalation of small droplets of water contaminated** by a sufficient quantity of bacteria. Therefore, the infection does **not occur by ingestion.** When it comes into contact with the lungs of those most at risk, pulmonary infection may occur.

About 60% of Legionella cases are due to **inadequate sanitary systems,** where water conditions can favor the proliferation of the bacterium. In particular, the water stagnation and water temperatures unsuitable create the ideal habitat for the formation and spread of Legionella in sanitary systems. The following image shows the parameters of development and proliferation of legionella within the different temperature ranges.

The critical range is in particular that **between 25 ° C and 50 ° C.** In the hot and cold water distribution systems it is good to take some measures to ensure that:

- cold water is kept at a temperature <25 ° C
- the hot water is kept at a temperature> 55 ° C



LEGENDA

- 25°C -50°C : development interval
- 35°C -45°C : critical range of development and proliferation
- >55°: beginning of the progressive death of the bacterium
- 70°C -80°C : rapid death rate of legionella

How to **avoid** the **spread** of the bacterium

CHEMICAL TREATMENT

Intervention discouraged in plants dedicated to the transport of drinking water, as some traces of the chemicals used for the treatment may remain inside the system, compromising the potability of the water.

PHYSICAL TREATMENT

A.THERMAL SHOCK: provides for a **significant rise in water temperature,** up to about 70-80 ° C [temperature which determines the rapid death process of the bacterium]. To be effective it is necessary to **raise the temperature for at least 3 consecutive days** and the water must run off at all points of the plant for at least 30 minutes. Due to the high temperatures required, this treatment cannot be performed with all types of pipes.

WATER TEMPERATURE RAISING

COMPLETE SYSTEM RECIRCULATION

RECIRCULATION FOR 30 CONSECUTIVE MINUTES

B. THERMAL DISINFECTION: it is a process that is mainly applied to sanitary water distribution systems. The **water** in the system is brought to a **temperature exceeding 50 ° C**, thus reaching the temperature range in which the bacterium starts the progressive death.
To increase the effectiveness of disinfection, moreover, the **water must periodically reach a temperature between 65 ° C and 70 ° C.**

We also recommend a **complete recirculation of the system** [at a temperature between 55 ° C and 65 ° C] to be carried out daily for at least 30 consecutive minutes. Due to the high temperatures required, this treatment cannot be performed with all types of pipes.

Prevention: **products**

It is essential to choose and use suitable products. Not all products on the market are able to respond effectively to the required temperature parameters.

The products of General Fittings meet both requirements: they have been tested and certified to withstand even high temperatures with a maximum use temperature that exceeds an average o 95°C.

The parameters to consider are:
- the maximum operating temperature
- the suitability of the materials

+95°C

MULTILAYER SYSTEM
5S00
TRIDENT
5300
5E00
TB00

+95°C/
+120°C

DISTRIBUTION MANIFOLDS
6200
6300

* these data do not refer to the peak temperature, which can be equal or higher at the maximum temperature of use.

+120°C

BALL VALVES
7S00
7100
7600
7700

+100°C/
+120°C/
+80°C

FITTINGS FOR COPPER PIPE
1200
1N00
1400

+100°C/
+120°C

FITTINGS FOR IRON PIPE
2100
2600
2700

+120°C

FITTINGS FOR PE-X PIPE
3300
3400
3700

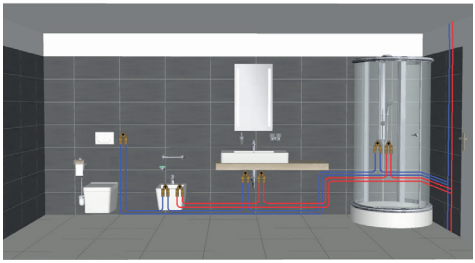
+80°C

FITTINGS FOR POLYETHYLENE PIPE
4500
4800

Prevention: **connections**

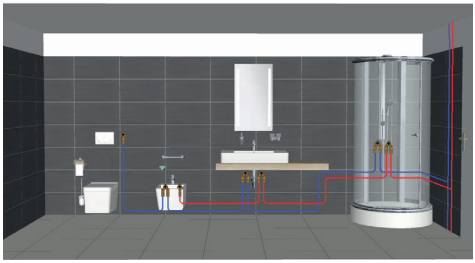
The great advantage of these fittings is the possibility of re-using them to **set up different types of connections**, including some that considerably inhibit the possibility of Legionella bacteria proliferation .

1. Ring connection



- Use of higher passages compared to a manifold connection.
- Low head loss
- Optimal water exchange
- Hygienically recommended: water flows constantly through the entire system, thus creating a continuous exchange.

2. Connection in series



- Quick installation
- Normal water exchange
- Hygienically recommended: leaving the WC as the last utility, the entire system is constantly passing water, thus creating a continuous exchange.

Precautions

- **limit unforeseen overheating** (through insulation of pipes, correct positioning of hot and cold water pipes ...)
- **avoid** sources of emission of **water vaporized** outside homes
- organize the production and storage of hot water at temperatures above 65 ° C
- guarantee an **adequate recirculation line** to support hot water and let it flow before using it
- provide for the **maintenance** and **cleaning** of taps, shower diffusers and water storage tanks
- **let the hot water flow** before using it, keeping away from the source after open the taps
- carry out emptying, cleaning and the disinfection of water storage tanks

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