

# Legionella qPCR

---



## Fast and reliable results for drinking and process water

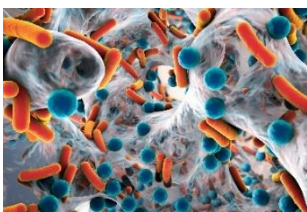
Legionella are aerobic, gram-negative rods and pose a health risk in various types of water. They can cause the threatening Legionnaires' disease or Pontiac fever. Divided into 58 species and 15 serogroups, they are found in drinking, bathing, process and waste water, among other places, where they often resist harsh disinfection measures. Especially in artificial water systems they become a dormant danger. It is therefore necessary to observe their spread and proliferation in order to be able to react quickly and appropriately in the event of suddenly raising cell counts.

### Legionella

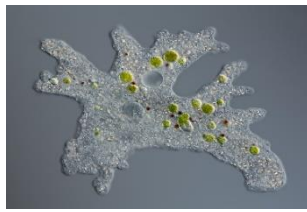
Legionella are found in all types of water and have developed sophisticated systems to protect themselves from external influences. Well hidden, they live together with other bacteria in biofilms, multiply within other unicellular organisms, the amoebae, or persist in the so-called VBNC status. These survival strategies not only make it difficult to combat them with disinfectants, but also to detect them in the laboratory. With the classical cultural detection methods (ISO 11731), they are not detected or only detected to a small extent. In addition, the cultural method is fraught with uncertainties and requires a great deal of experience in evaluation.

PCR circumvents these disadvantages and offers fast and reliable results after only a few hours.

#### Survival strategies of legionella



formation of biofilms



replication in amoeba



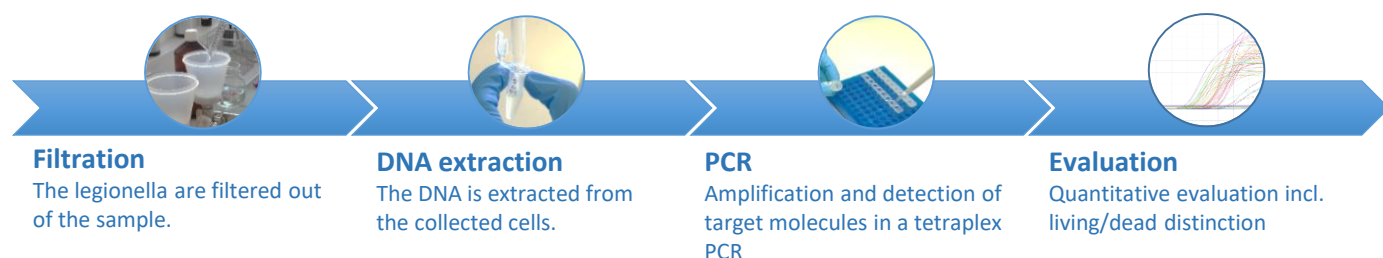
VBNC (= viable but not culturable cells)

### qPCR Method

The **quantitative multiplex PCR** with live/dead differentiation combines all advantages of the PCR technique. It is a very sensitive detection method, can distinguish 4 different DNA target sequences in parallel and quantify them by comparison to reference standards. Optionally, the sample can be treated beforehand with a reagent that only penetrates cells whose cell membrane is permeable, i.e. only cells that are incapable of replicating. This reagent prevents the amplification of the DNA and enables a statement to be made on the ability of the legionella to multiply.

The following statements can therefore be made:

- How many Legionella are in 100 ml of the sample?
- Which species and serogroups are contained in the sample and in which proportion (*Legionella* spp., *L. pneumophila*, *L. pneumophila* SG 1)?
- Do the cells found have an intact cell membrane and what is their percentage?



## Your advantages at a glance

Benefit from the speed and superiority of Legionella qPCR not only in the event of a crisis, but also for the regular control of your system.

	ISO 11731	qPCR
live legionella	+	+
total legionella	-	+
VBNC	-	+
legionella in amoebae	-	+
inclusivity	↓	↑
selectivity	↓	↑
differentiation	additional serotyping necessary	<i>Legionella</i> spp. / <i>L. pneumophila</i> / SG1
duration of the analysis	7 days	4 hours

## About the analytics

- **Matrix:** Drinking, bathing and process water
- **TAT** (turnaround time): 3 days (rush analysis possible = 1 day)
- **LOD** (limit of detection): 3 or 5 GU/reaction (= 21 or 36 GU/100ml), depending on species and serogroup, respectively.
- **LOQ** (limit of quantification): 10 GU/reaction (= 71 GU/100ml)

Contact us for an **offer tailored to your** needs.

**Institute Kirchhoff Berlin GmbH**

Sandra Witt, Sandra.Witt@mxns.com, +49 (0) 30 457 98 930

Oudenarder Straße 16 / Carrée Seestraße, 13347 Berlin-Mitte, [www.institut-kirchhoff.de](http://www.institut-kirchhoff.de)