Interreg North-West Europe Water Test Network

European Regional Development Fund

THE EUROPEAN TEST FACILITY NETWORK FOR WATER INNOVATION

Summary Test Report LEGIO.logic

Water Test Network

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LEGIO.tools developed the product **LEGIO.logic** which is an online monitoring system for drinking water, able to detect bacteria, microorganisms and other particles using microscopic images and object-recognition software in real time. Additionally, the product **LEGIO.sampler** was developed. This is an automatic water sampling system, which fills a sterile container with up to 1 L water, either by manual start or after a predefined trigger sent by the LEGIO.logic.

The results showed that the product **LEGIO.logic** as point of use-device works perfectly as online monitoring system for drinking water in real time. The long-term experiments with different drinking waters were running smoothly without problems.

LEGIO.logic can detect changes in bacterial concentrations in real time. When changes in the total number of bacteria over a predefined limit occur, an automated information for the user can be triggered as well as an automated sampling, if the **LEGIO.logic** is combined with the product **LEGIO.sampler**. It could be shown, that this automatic water sampling system works properly.

The concentration of bacteria is detected for concentrations of 10^3/mL and higher. Changes of the total numbers of bacteria can be seen, but of course, this is not a specific detection for instance of hygienic relevant bacteria. This can however be determined by conventional testing by taking a water sample directly when a threshold is reached.

The drinking water is therefore continuously checked to detect changes of bacterial or particle concentrations and thus detects increased bacterial concentrations before they exceed the predefined limit values and therefore possibly could produce a health risk. In this way, appropriate countermeasures can be taken in a timely manner.

The object-recognition software works well in real time giving concentrations of detected particles. Additionally, it calculates a form criterion, which could be shown to be changed significantly, if sediment particles are present in the water. So, this calculation helps to identify, if the particles can be regarded mainly as bacteria or more as non-bacterial sediment-like particles.

The results of these trials within the EU-project Water Test Network led to some new insights to the online-monitoring of LEGIO.logic. Especially, they could show, that the system works continuously as expected without problems. Also, the automatic sampling procedure is a very good tool and ready for use in practice.