



Legionella prevention: How to effectively remove Legionella from drinking water.

In this edition we continue to reveal the efficacy assessment of the Ecas4® Water Disinfection System, through real life cases of reduced Legionella contamination in the drinking water heating systems of St. Marien Hospital in Bonn.



Case Study 2: St. Marien Hospital in Bonn

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Efficacy assessment of the Ecas4 Water Disinfection System - related to the decrease of Legionella contamination in a drinking water heating system.

Background: The highly ramified and extended water piping of St. Marien Hospital in Bonn had been periodically inspected for Legionella in the past. The concentration of Legionella found in the hot water system repeatedly exceeded the recommendations contained in DVGW W 551. In order to temporarily reduce the concentration of Legionella, the hot water systems were periodically heated to higher temperatures; the issuance of hot water (over 70°C) from all taps in order to eliminate all contaminations was not possible for logistic reasons. Since continuous temperature increase was not feasible for economic and technical reasons, it was chosen to install an Ecas4 Water Disinfection System (WDS) positioned in the cold water station of the hospital to lower the concentration of Legionella to beneath the recommended threshold of 100 cfu/100 ml.

Methods: According to the manufacturer's indications, the Ecas4 WDS produces an active 'Anolyte' substance which is injected in a concentration by volume of 0.3-0.8% directly into the water subjected to the treatment. This Ecas4-Anolyte is produced on-site via an electrochemical process from a 0.5% sodium chloride solution (a saturated solution of salt and softened water). The Anolyte is collected in a back-up container and then injected into the pipes by a piston membrane dispensing pump in proportion to the

amount of water subjected to the treatment. The dispensing operation is monitored by a contact water meter. By means of the implemented control functions (electrical conductivity, electrical current constancy), the manufacturer ensures the correct operation of the 0.5% sodium chloride solution and production of Ecas4-Anolyte.



Results: A decrease in the concentration of Legionella at all taps was found immediately after installing the disinfection system in the drinking water heating system of the central building/paediatric ward.

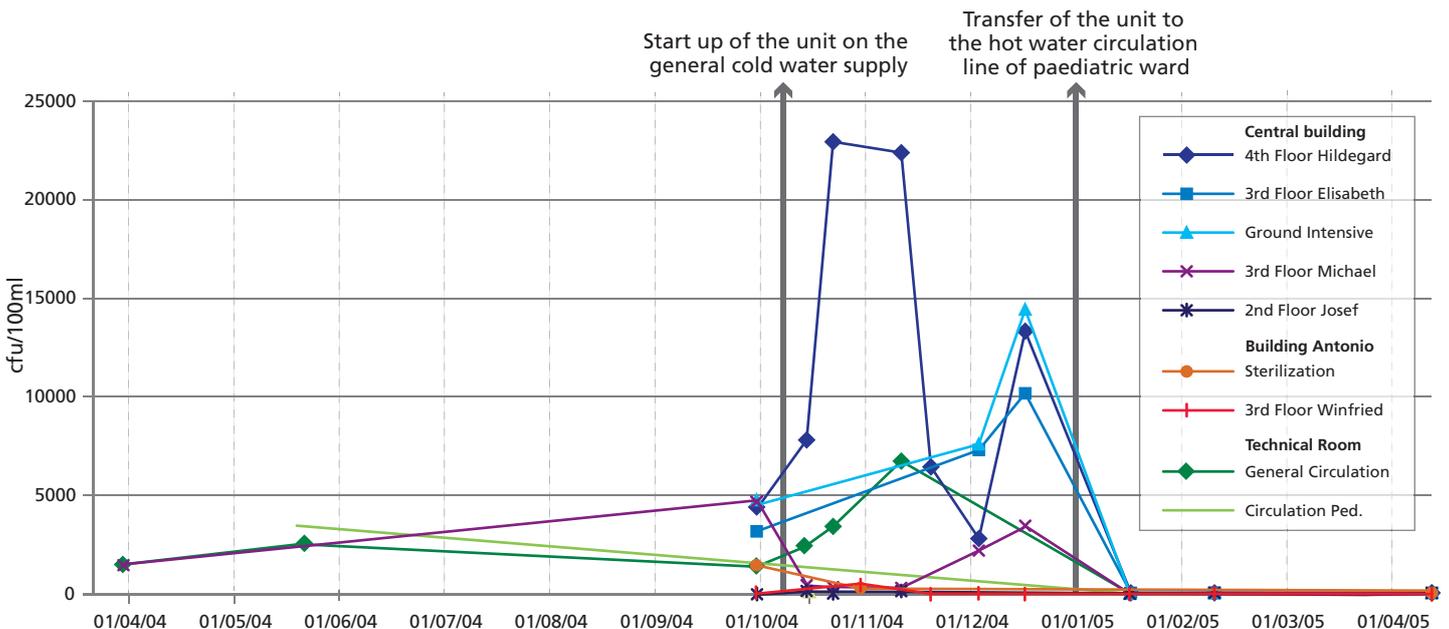
Follow-up measurements taken after one month and after three months confirmed the success of the intervention. It was suggested to keep the Ecas4 WDS running in the building in the future and to monitor system efficiency at longer intervals. The positioning of the system in the cold water station was too far away from the target, i.e. the drinking water heating system of the central building/paediatric ward. As per §11 of the "Trinkwasserverordnung 2001" [German Drinking Water Code], the required concentrations of Ecas4 Anolyte in the cold water would not be allowed on in the long term. Alternatively, a possible treatment with a lower concentration of Anolyte for a longer time was deemed not advisable due to the waiting time and the high concentration of Legionella. After starting up the Ecas4 WDS, efficiency with considerably lower concentrations of Anolyte was obtained, supporting the initial hypothesis of being able to provide appropriate metering by using two separate systems.

A decrease in concentration is currently in progress to ensure a maximum value of 0.3 mg/l of free chlorine at all taps as determined by the "Trinkwasserverordnung 2001". According to our experience, this objective is feasible: long term success will be validated by further controlled monitoring.



Conclusions: As this analysis shows, it was possible to considerably decrease the concentrations of Legionella bacteria in the hot water piping of the central building/paediatric ward by means of 0.2 - 0.5 mg/l concentrations of Ecas4-Anolyte (measured as free chlorine).

Table: Results of Legionella monitoring in St. Marien Hospital during the installation of the Ecas4 Water Disinfection System (Sampling temperatures 43-58°C)



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