

Final Report Summary

A Feasibility Study into an Automated Method of Optically Assessing Legionella Test Cassettes



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hydrosense® have developed an easy-to-use field test for Legionella pneumophila serogroup 1, which provides test results in minutes instead of days. Legionella is a human pathogen that is the causative agent of Legionnaires' disease, which has a fatality rate during outbreaks of 5% to 30%. The field test consists of a human readable test cassette similar in appearance to a pregnancy test device.

Currently customers use the test cassettes as an indicator of a positive or negative presence of the bacteria but it is also possible, in principle, to ascertain the concentration of the Legionella pneumophila serogroup 1 antigen in a sample by the intensity of the positive indicator. Quantitative assessment is open to human misinterpretation and can be a very subjective measurement. On the other hand qualitative assessment (presence-absence) is more repeatable provided the operator is correctly trained and the test is examined in good light. Even with qualitative assessment it is desirable that there is a record of the test result for quality and regulatory purposes.

Project Aim

The aim of the project was to investigate the feasibility of creating an automated method of optically assessing the results from hydrosense®'s test cassettes using a low cost camera system. The automated method would remove human judgement errors and enable results to be easily stored in electronic format, improving traceability of results. hydrosense® chose iSLI as its TTOM partner based on its in-house knowledge of algorithm design and experience in developing low-cost image processing systems.

Project Outcomes

The collaboration between hydrosense® and iSLI during the TTOM project has resulted in the development of an algorithm paired with an off-the-shelf tethered digital camera capable of successfully detecting positive and negative results and distinguishing between different levels of Legionella concentrations. This outcome has provided hydrosense® with a platform that is at a significantly lower cost than current industrial solutions available.

It is expected that hydrosense® will further develop the hardware and software elements of the platform into an end-user product for the analysis of test results in the field. The TTOM project has enabled iSLI to build a strong relationship with hydrosense® which will form the base for future collaborative work.

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