hydrosense

smarter test, safer water

Innovation in Business: Hydrosense Ltd

Hydrosense Ltd. is an environmental testing technology business specializing in industrial applications. The company is the producer of breakthrough technology for the rapid detection of Legionella in water and biofilms. The Hydrosense Legionella test provides results in only 25 minutes and is the fastest Legionella test that can be performed on-site. It requires no training or experience.

Until the development of the Hydrosense, test the gold standard for detection of Legionella was the lab culture method. The culture method is still used by most laboratories in the world. However, it requires selective media and prolonged incubation periods. A concentration stage is followed by decontamination with heat and acid, which may involve loss of the target bacteria. The incubation stage itself takes 7-14 days to provide results and does not identify the virulent phase of the bacterium when the bacterium is viable but non-culturable.

Hydrosense Ltd. was originally established by two chemists, who recognised that methods of Legionella testing available on the market were slow, cumbersome and inaccurate. Having identified a niche in the market their objective was to develop a test which would continuously measure concentrations of Legionella in a water system. This proved impossible, but the insights developed during the initial work allowed a better understanding of how Legionella antigen can be used to quickly identify Legionella in water. They used these insights to harness well-established lateral flow test technology, used in pregnancy tests, to detect Legionella antigen. The result was the Hydrosense Legionella field test.

Last year Hydrosense demonstrated its high levels of creativity by developing and patenting a novel Smartphone-based reader to read the test and quantify test responses. This tool provides the ability to read a test even better than an experienced user. By using the computing and video capability in the smart phone to compare the strength of the test line with the control line the app gives an indication of the amount of Legionella antigen present in the water system. It provides a user with a result on a scale 0-10 (where is 0 is a negative result and 10 represents very high levels of Legionella). The app is also supported by a secure electronic Logbook which enables users to track and monitor results and associated data.

The Hydrosense Legionella antigen test mimics tests used in hospitals to diagnose Legionnaires' disease. This breakthrough technology has been optimised to quickly detect cell surface Legionella antigen in all kinds of environmental water samples and all phases of the bug's life cycle. It detects all ten recognized subtypes of L. pneumophila serogroup 1 (LpSG1), the species of Legionella which has caused 88% of all cases of Legionnaire's disease and has been responsible for all known outbreaks.

A water sample is placed on the test strip sample point. The result window has a test band and a control band. The control band always indicates a strong red line. If the test is positive the test band shows as a second red line of varying strength depending on the amount of Legionella antigen present. In a negative result only the control line is visible.

The original test was able to detect 100,000 cells per litre of water, which in the USA and other countries is the standard requiring immediate biocide treatment. The sensitivity of the test was enhanced using further innovation. A cell trap filter was used to capture bacteria in a sample. This can still be done on site and allows concentration of the sample improving the test sensitivity to 100 cells per litre. The UK and the Netherlands, require enhanced monitoring of the water system at this level and maintenance of control measures.

Hydrosense customers come from a wide range of industries. The convenience and ease of use of the Hydrosense test make it first choice for companies with facilities in remote locations e.g. shipping, including cruise and leisure, offshore oil drilling and remote mining. The Hydrosense test kits are also particularly valued in sectors where reputation management is important e.g. hotels, teaching establishments, leisure centres, swimming pools and spas, or where clients are often at high risk: e.g. dentists, care homes, and hospitals. The 7-14 days waiting for a result from a lab test is a time when employees and the public may continue to be exposed to risk. The death rate in outbreaks can rise above 15% and the elderly and infirm are especially at risk.

The Hydrosense innovative method has been recognised and independently validated by both commercial and research institutions around the world including China. The Dutch Water Research Institution (KWR), compared the test with lab culture and PCR methods stated that the Hydrosense test is a useful addition to the set of instruments for the daily management of cooling water systems. It also mentioned that its speed and simplicity make it exceptionally interesting for monitoring in emergencies.

Hydrosense products are becoming more popular throughout the world. The company increased sales global by 16% last year and received fantastic feedback on the app test reader. Customers believe that the innovative technology used in the tests along with the app and portal make the Hydrosense Legionella testing one of the most complete in the world today, enabling Real Time management of Legionella risk for the first time.