

Peristaltic pumps provide closed-loop recirculation system for analysis of pathogens in food samples

Value for life



“The Watson-Marlow pumpheads are key to the success of the Pathatrix system, providing the circulation that ensures that the entire sample is analysed.”

Dr Adrian Parton
Managing Director
Matrix Microscience

THE CHALLENGE

Matrix Microscience is a specialist company that has recently developed a novel technique for analysing food samples to detect the presence of Salmonella, Listeria and E. coli pathogens. Whereas most conventional rapid techniques only analyse a fraction of the standard 25 g sample, Matrix Microscience's Pathatrix system is unique in that it circulates the entire sample so as to detect the target pathogens, even if there is only one present in the entire 25 g sample. To do this requires a pump that is easy and quick to use, does not require cleaning or maintenance, and guarantees no cross-contamination between samples. The only technology that fits the bill is peristaltic pumping, and there is only one company's pumpheads that provide the simple access, robustness and reliability that are required: Watson-Marlow.

**WATSON
MARLOW** PUMPS
Bredel

Value for life



“Watson-Marlow pumpheads appeared to be the most robust choice, and their longevity has now been proven in the field: in two years, we have not had a single problem.”

Dr Adrian Parton

Managing Director
Matrix Microscience

THE SOLUTION

Each Pathatrix system consists of five independent testing stations within one housing, so there are five off-the-shelf Watson-Marlow 313D series pumpheads per machine. Matrix Microscience also produces proprietary consumable packs that include a length of tubing for use in the pumphead. This means that the tubing in the pumphead is only ever used for one sample, thereby eliminating the risk of cross-contamination. Furthermore, with the tubing made from a compliant silicone rubber, the instruments are capable of analysing an extremely wide variety of food samples, from milk and yoghurt to acidic products and solid samples – such as ground beef – that are homogenised with the 225 ml of liquid growth media.

Another element of the recirculated medium is the Pathatrix capture reagent, which consists of magnetic particles that are coated with an antibody specific to the target pathogen. Once loaded, the Pathatrix workstation runs for 180 minutes at the desired incubation temperature – from 30 to 37 degrees C – with the Watson-Marlow pump circulating the fluid within a closed loop to ensure complete incubation. After the incubation step is finished, the target microorganisms, now captured by the reagent, are magnetically restrained while the residual debris and other unwanted material is removed when the peristaltic pump operates again for the wash step.

The capture phase is then removed from the system and is further processed so that pathogen colonies can be viewed within 16 hours of the start of the analysis. This is a significant saving compared with the two days or so that is usually required, and there is an additional benefit in that the sample is not contaminated with non-target organisms. Independent tests have shown the Pathatrix system to be 221% more sensitive than the standard USDA FSIS (United States Department of Agriculture, Food Safety and Inspection Service) method, as well as being quicker and requiring only minimal hands-on time, unlike the labour-intensive alternatives. As a result of the tests undertaken at Campden & Chorleywood Food Research Association, the Pathatrix system has now received AOAC (Association of Official Analytical Chemists) R1 Validation.

THE OUTCOME

Dr Adrian Parton, Managing Director of Matrix Microscience, states: “The Watson-Marlow pumpheads are key to the success of the Pathatrix system, providing the circulation that ensures that the entire sample is analysed. One of the benefits of the Pathatrix system is that it needs only around two minutes of hands-on time, and the 313D pumphead’s flip-top design and automatic tube tensioning are perfect in this respect. Before we specified this unit, however, we did evaluate several alternatives. Nonetheless, the Watson-Marlow pumpheads appeared to be the most robust, and their longevity has now been proven in the field: in two years, we have not had a single problem.”

**WATSON
MARLOW** PUMPS
Bredel

For further information on Watson-Marlow Bredel pumps in the Water and Waste industry, please request copies of application and technical data sheets.

TELEPHONE 01326 370370 FAX 01326 376009 EMAIL info@watson-marlow.co.uk

www.watson-marlow.co.uk