

Automated Cell Culture Machine Uses Peristaltic Pumps from Watson-Marlow

Value for life



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David Jervis
Applications Manager
TAP

THE CHALLENGE

The Automation Partnership (TAP), a specialist in automated life science applications, worked with a consortium of six major pharmaceutical companies to develop a fully automated, flexible batch cell culture machine.

Tasked with the challenge of producing high quality, consistent cells for drug discovery on demand, TAP required a pump that could meet the demands of delivering a high performance metering system as an integral part of the machine.

**WATSON
MARLOW** PUMPS
Bredel



The consortium of major pharmaceutical companies involved in the development of the SelectT machine include GlaxoSmithKline, Merck, Pfizer, Bristol-Myers Squibb, AstraZeneca and Parke-Davies.

THE SOLUTION

David Jervis, Applications Manager at TAP comments: "Unlike manual cell cultivation methods, the SelectT allows entire automation of the process, resulting in increased consistency and individual cell traceability. With this in mind, we turned to Watson-Marlow Bredel for a peristaltic pumping solution."

The growth and harvesting process begins by placing flasks of cells into an incubator within the unit that are then fed with cell culture media. After the culture media surrounding the cells no longer contains any food, the fluid is pumped out of the unit to be safely disposed of. During this period the cells will have grown considerably and will be ready for splitting into multiple batches. Once these are fully confluent, (a term used to describe the entire base of the plate being covered with a single layer of cells) they are all harvested, pooled together and robotically put into the cell counter, ready for the final stages of growth.

The system requires reliable pumps that provide high performance metering while being easy to clean and maintain. For this reason, TAP turned to Watson-Marlow Bredel and the 314D peristaltic pump heads.

THE OUTCOME

Typically measuring around 2m x 2m x 3m, the SelectT provides a completely controlled class 100 hepa-filtered environment for totally sterile cell culture growth. This allows pharmaceutical companies to grow and harvest cell lines overnight or at weekends, without the need for supervision – enabling screening five days a week.

The heart of the system relies on up to fifteen Watson-Marlow 314D peristaltic pump heads vertically mounted on the machine's external front face, metering process fluids such as cell culture media or PBS rinse solution. Using silicone tubing linked to a rack or refrigerator containing the fluids, liquid is transferred into the sealed unit of the SelectT for metering onto cells.

The SelectT also employs two Watson Marlow's 313FAC pumps externally mounted alongside the 314D pump heads. These transfer the fluid required for the washing and priming station, used to clean the cell pooling and dispensing pot. From here the cells are dispensed into multiwell plates.

The 313FAC and 314D peristaltic pumps from Watson-Marlow Bredel are both specially designed for 24-hour operation. The 313FAC has flow rates at 50Hz up to 1350ml/min at 270rpm. The 314D has four rollers for minimum pulsation and accepts seven tube sizes without the need to for adjustment.