

Peristaltics neutralise the pH problem at Buckton Castle Water Treatment Works

Value for life



The viscous lime slurry used to maintain a neutral pH during the water treatment process was causing frequent blockages in the diaphragm pumps used by Buckton Castle WTW. However, the installation of two peristaltic hose pumps supplied by Watson-Marlow Bredel has overcome this problem, substantially reducing both the time and cost of maintenance required.

THE CHALLENGE

Buckton Castle Water Treatment Works (WTW), based in Mossley, near Manchester, supplies up to 50 megalitres of water a day to over 120,000 people in the Tame Valley. The water is supplied to the site from reservoirs in the Greenfield and Swineshaw Valleys.

During the water treatment process, lime slurry is added to the water supply at several points in the system in order to maintain the required pH level. The alkaline solution is added firstly during the coagulation process, which causes unwanted particles in the water to stick together so that they can be extracted from the

“I am an engineer by trade and have worked with Bredel pumps before. I have always found them very easy to use and maintain, as they have a simple design. This makes the whole process easier, particularly as the hoses fitted are made from reinforced flexible PVC. Before, with the rigid diaphragm pumps, one small blockage would require a major strip down as we couldn't see where the problem was.”

Mike Whittam
Process Technician
at Buckton Castle

solution. Further along the system, lime slurry is again dosed into the water, to correct the pH during two stages of filtration before it enters supply pipelines.

Buckton Castle had been using diaphragm pumps to achieve this dosage, yet at low flow rates the pumps frequently became blocked with the viscous slurry, causing maintenance problems and increased down-time.

THE SOLUTION

In peristaltic pumps, liquid is drawn into a hose and pushed through it by the action of pressing shoes. Because nothing but the hose is ever in contact with the fluid, there is no risk of the fluid contaminating the pump, or of the pump contaminating the fluid. As the hose is the only wearing part, and can be replaced without dismantling the pump, maintenance is simple and low cost.

Buckton Castle WTW is currently using ten Watson-Marlow Bredel peristaltic pumps: SPX15's (maximum flow 525 litre/hour and pressures up to 7.5 bar) and SPX25's (maximum flow 2,800 litre/hour and pressures up to 16 bar). These are both capable of pumping viscous and high density fluids, while the accuracy of the flow rate ($\pm 1\%$) makes them highly suitable for dosing applications.

Importantly for Buckton Castle, they are also fitted with camlock connectors, so that any problems can be fixed quickly and efficiently. The SPX25 features an enhanced hose clamping and flange design, which significantly reduces the time to change the hose, and also improves the effectiveness of the sealing system.

THE OUTCOME

Process Technician at Buckton Castle, Mike Whittam, says that the Watson-Marlow Bredel pumps are a great improvement for the treatment works: "I am an engineer by trade and have worked with Bredel pumps before. I have always found them very easy to use and maintain, as they have a simple design. This makes the whole process easier, particularly as the hoses fitted are made from reinforced flexible PVC. Before, with the rigid diaphragm pumps, one small blockage would require a major strip down as we couldn't see where the problem was."

The design of peristaltic pumps prevents backflow, and means that no valves are required, significantly reducing blockages. Accuracy of the delivered volume and flow rate are parameters which can be fully tailored through the size of the pump, the rotor speed and the tube diameter.

The pumps are fitted with a number of safety features including pressure relief switches which ensure any excess force is pumped back into the suction system to do a full circle and pressure sensors that will show if the system is running correctly.

