SEEPEX.
An Ingersoll Rand Business

ABSOLUTELY ACCURATE

APPLICATION DETAILS

- Dosing molasses and urea from intermediate bulk containers into a large equalizing tank
- Viscosity 19,000 cP

KEY SPECIFICATIONS

- Handles highly viscous media with viscosity fluctuations
- No ball valves to clog due to viscous media
- Accurate dosing of ± 1%
- No pulsation dampeners required
- Flow rate controlled by frequency inverter
- CE EX II 3G IIC T4 X

BACKGROUND

Overlooking the Fergus River in Clarecastle, Co. Clare, the Irish subsidiary of one of the world's leading healthcare company specializes in the manufacture of active pharmaceutical ingredients. Wastewater generated from production is treated at the company's effluent plant adjacent to the production site. It is paramount that the effluent has a pH 7 before disposal in line with environmental regulations.

To balance the pH of the various waste by-products, molasses is used to control the alkalinity of waste and urea to control its acidity. Molasses is an abrasive and highly viscous syrup-like sugar production by-product. Its viscosity also fluctuates with changes in ambient temperature, becoming thicker at lower temperatures.

Effluent water from pharmaceutical production has to be treated before it is disposed.

TASK AND TARGET

SEEPEX was tasked with delivering a pumping solution which would replace problematic diaphragm pumps in dosing molasses and urea from intermediate bulk containers (IBCs) into a large balance tank. The location where the pumps were installed was hazardous, meaning that the complete pump, variable speed drive, dry running and protection against overpressure had to be certified according to CE EX II 3G IIC T4 X.

VARYING VISCOSITY – CONSTANT FLOW

COST SAVINGS

REDUCED MAINTENANCE COSTS

LESS CHEMICAL USAGE, DUE TO EXACT DOSING

SEEPEX PRODUCTS

- Two identical pumps, range BN
- Pump flow 0.1m³/hr-0.6m³/hr
- Discharge pressure 4-5.5 bar

Due to the high viscosity of the molasses, at 19,000 centipoise (cP), the diaphragm pumps suffered from inconsistent flow which resulted in either underdosing or overdosing of the product, leading to increased chemical consumption and fluctuating pH levels in the balance tank.

In addition, the high viscosity caused the ball valves within the diaphragm pumps to stick, resulting in significant maintenance downtime.

SOLUTION

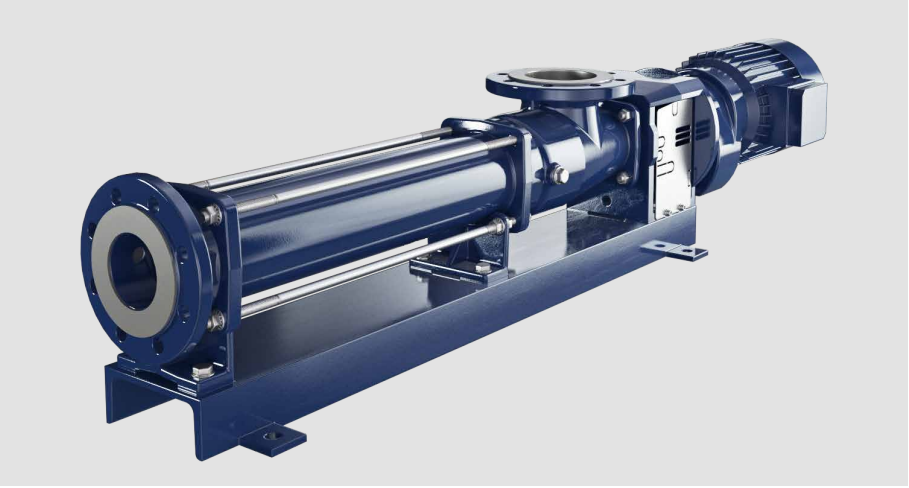
Two identical SEEPEX progressive cavity pumps from the BN range were selected to handle the urea and molasses, which has a viscosity of approx. 19,000 cP and varies depending on ambient temperature. The equipment was designed to deliver a constant flow between 0.1m³/hr and 0.6m³/hr at a 5.5 bar discharge pressure. To ensure accurate dosing of ±1% and high repeatability with minimal pulsation, a 2-stage pump (designed for 12 bar) was selected.

RESULTS

Replacing the diaphragm pumps with SEEPEX progressive cavity pumps eliminated the ongoing cost associated with maintenance issues resulting from the ball valves becoming clogged, and improved the uptime and availability.

BENEFITS

- Reduced maintenance costs (no ball valves)
- Accurate dosing improved the balancing of pH in tanks



Progressive cavity pumps, such as the BN series, have been used for many years for pumping waste- and effluent water on production sites.