

Sinusoidal pumps reduce fruit juice decanting time

Cavitation and noise issues initially prompted industry-leading beverage giant Halewood International to seek an alternative to its existing centrifugal pumps when decanting sugars and fruit juice concentrates from tankers arriving at its UK headquarters in Merseyside.

Installing three Maso-Sine SPS4 pumps from Watson-Marlow Pumps Group, the solution has been successful in a number of ways, not least because unloading times for sugars have been halved and for syrups more than quartered!

Halewood International is the UK's largest independent drinks manufacturer and distributor with a turnover in excess of £250 million and more than 1000 employees worldwide. The company manufactures some of the UK's best known alcoholic drinks brands from Lambrini to CRABBY'S ALCOHOLIC GINGER BEER and from Red Square vodka to Reloaded. The company also distributes Lamb's Navy Rum and Tsingtao Chinese beer. Tanker after tanker arrives day-in, day-out with millions of liquid litres of fruit juice syrups and sugars to help maintain optimum production output.

"Due to the high throughput of the Merseyside plant, decanting high volumes of liquid from tankers into holding vessels becomes a strategically critical operation," says

the company's Production Trainer, Harry Anderson. "Until recently the incoming sugars and syrups were unloaded using high pressure hoses and centrifugal pumps. However, the pumps were cavitating and causing loud, knocking noises that could potentially irritate local residents. The pumps were also ageing and becoming too slow for our requirements."

Cavitation is a well-documented problem in centrifugal pumps. As the impeller blades move through a fluid, low pressure areas are formed as the fluid accelerates around and moves past the blades. The faster the blades move, the lower the pressure around it can become. As it reaches vapour pressure, the fluid vaporises and forms small bubbles of gas - this is known as cavitation. When the bubbles collapse later, they typically cause very strong local shock waves in the fluid, which are usually audible and may even damage the blades.

As is so often the case, the solution arrived almost by chance. One of Mr Anderson's colleagues



had successfully used MasoSine pumps in a previous employment and this became the suggested route forward, commencing initially with the sale-or-return trial of an SPS4 high pressure model supplied by Watson-Marlow.

The MasoSine SPS series of pumps feature an exclusive sinusoidal rotor for gentle, low shear product handling, while their heavy duty construction means they can also handle high pressure applications. "Some of the cold syrups can be extremely viscous so the pump would need to be fairly robust in its operation," says Mr Anderson, "but most importantly the issues of speed, cavitation and noise would need to be overcome."

Duly installed in position the MasoSine SPS4 performed admirably, not only eliminating cavitation and noise, but reducing the unloading time for sugars and syrups dramatically.

"Using our old centrifugal pumps

it would take around 60 minutes to unload a tanker full of sugars. This has been reduced to 35 minutes using MasoSine technology," states Mr Anderson. "Perhaps most impressive is that the time taken to decant a tanker full of fruit juice syrup has been cut from 4 hours to just 45 minutes."

A total of three MasoSine SPS4 pumps are now in operation at Halewood International's Merseyside plant where they have been used for 12 months at a rate of 3-4 times a day. To date Mr Anderson confirms there have been no reliability issues.

"As a sound production idea this project has turned out well," he concludes. "The reductions in unloading times mean we can get more tankers in and out, which means we can be more flexible than before in response to production demands. Ultimately, the pumps have paid for themselves very quickly."



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