

Juice Concentrate

Increase Flow | Eliminate Cavitation | Reduce Maintenance

The challenge

Pumping fruit juice may sound straightforward but ask any beverage manufacturer and they will say this is far from the case. Fruit juice generally arrives at beverage plants in two components – as sugars and syrups/concentrates. In the case of the cold concentrates particularly there are issues of acidity and high viscosity, which in turn can make pumping slow and prone to noise caused by cavitation if the correct pump type is not specified.

Cavitation is a well documented problem in certain pump types, such as centrifugal pumps for example. As the impeller blades move through a fluid, low pressure areas are formed by fluid accelerating around and moving past the blades. The faster the blades move, the lower the pressure around it becomes. As it reaches vapor pressure, the fluid vaporizes and forms small bubbles of gas – known as cavitation. When the bubbles collapse, they typically cause very strong local shock waves in the fluid, which are usually audible and may even damage the blades.

What customers in this sector require is a cavitation-free pump capable of delivering high transfer rates, low shear to maintain product integrity and low maintenance requirements/costs.





The story of success

is similar at Halewood International. Halewood, which was experiencing low transfer rates and cavitation issues, wanted to find an alternative to its existing centrifugal pumps when decanting sugars and fruit juice concentrates from tankers. Installing three MasoSine SPS4 pumps, the solution has been successful in a number of ways, not least because unloading times for sugars have been almost halved (from 60 minutes to 35 minutes), and for concentrates more than quartered (from four hours to 45 minutes).

The solution

The unique MasoSine pump design is ideal for the transfer of juice concentrates. The low shear action generated by the single shaft and sinusoidal rotor transports juice through the pump without damaging the product. Furthermore, the smooth laminar flow produced by MasoSine pumps maintains product stability and ensures greater metering accuracy.



MasoSine pumps create a powerful suction, reducing cavitation while increasing flow rates. With little to no cavitation, system shocks caused by the pump are greatly reduced or eliminated, which in turn reduces wear and maintenance costs.

Customer success

Typical juice concentrate transfer often calls for a MasoSine pump SPS-4/6 or MR-160 pump to replace an equivalent positive displacement rotary style pump.

One particular customer was experiencing high rebuild costs and significant downtime during peak unloading periods due to the extremely low flow rate of the cavitating pump and its lack of suction capability. The pump was only capable of unloading concentrate at a rate of 35 gallons per minute (132 liters per min), which equates to 2.5 hours per tanker truck.

Following the installation of MasoSine pumps, the product yield on each tanker increased by 100 gallons, while the unloading time for a 5,300 gallon tanker (20,000 liters) went from 2.5 hours to just over one hour. The customer was also impressed with the ease of maintenance.