WANNER Hydra-Cell® Seal-less Pump Technology

Case Study

RO pilot plants share gentle, transportable raw milk pump unit

Wherever bulk containers of milk have to be moved from a point of production to scattered packaging and distribution centres, the attendant costs can be very high because of the high water content of the product. Extraction of water by reverse osmosis can substantially reduce the liquid volume of raw milk, lowering bulk and transport costs and also extending shelf life.

When Tetra-Pak India was developing a series of pilot plants for this purpose at its Pune facility, the company had to overcome a multi-aspect pumping problem. The plants are for use in various locations in India and elsewhere. One of their features is that they are able to share a single pump and motor unit compact enough to shift between locations at need.

The pumping challenge was to meet that requirement while matching application demands that include constant flow, stable high-pressure delivery to the RO membrane, gentle product handling and compliance with the required stipulations for hygiene and ease of access for cleaning. A Hydra-Cell G10 seal-less pump supplied to an optional hygienic specification satisfied all these conditions.

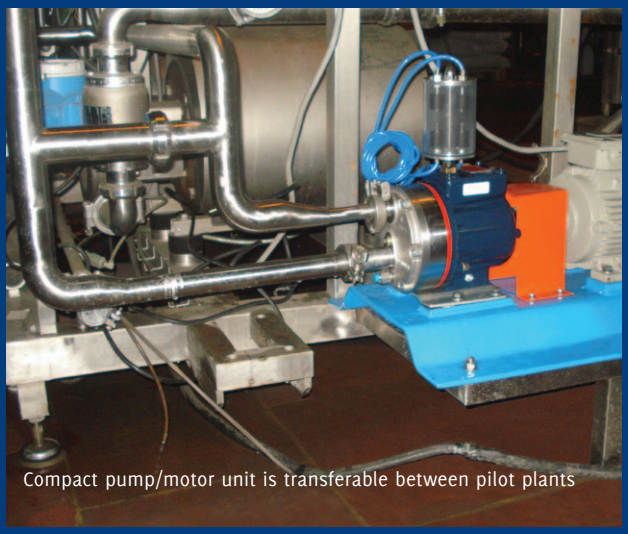
Pump code: G10SKSJSNETE with Tri-Clamp Ferrules and internal polishing of wetted parts to 0.8 Ra.

In the RO process, water content is removed by pumping raw milk at pressure across a fine filtration membrane - water passes through, while concentrated milk is retained for shipment and eventual reconstitution in other locations.

Originally a centrifugal pump was used to feed milk to the membrane, but it was not satisfactory. Milk is sensitive to shear forces. At the high operating speeds needed by this type of pump to generate filtration pressure, the properties of the liquid were affected and the system was unable to maintain milk quality.

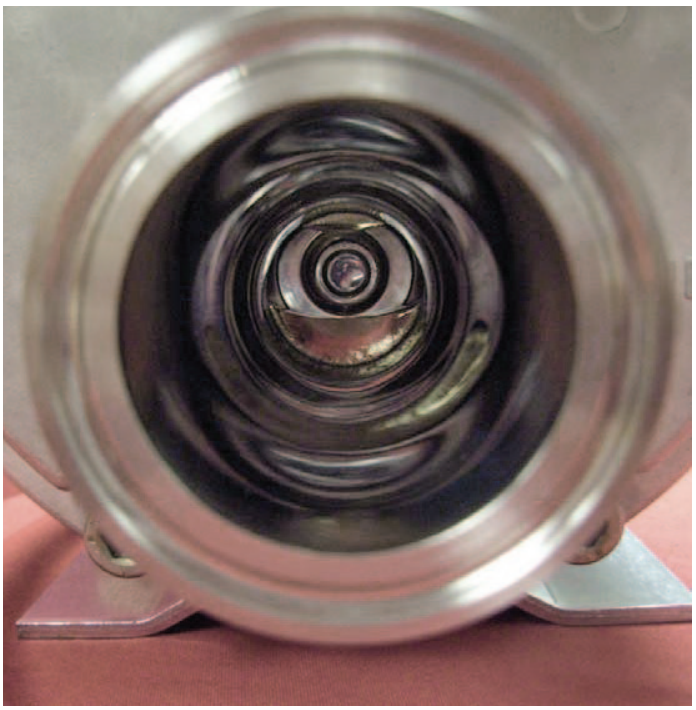
Customer – Tetra Pak India

Tetra Pak India is one of the numerous Hydra-Cell customers who have appreciated the benefits of our seal-less pump technology and subsequently shared their experience with us.



Compact pump/motor unit is transferable between pilot plants

In place of the centrifugal pump the Hydra-Cell G10 pump is now in use. For this application, handling a biodegradable food product, the optional hygienic specification included mirror-finish internal wetted surfaces polished to 0.8 Ra. Tri-clamp stainless steel flange fittings and drain plug give easy access and convenience for cleaning.



This modification can be offered for all models in the G Series and P Series of Hydra-Cell pumps.

In its basic design and construction the pump supplied to Tetra Pak India is not different from other versions of the G10 and its features are shared with models of higher or lower capacity throughout the Wanner Hydra-Cell range of seal-less industrial diaphragm pumps

Among those features – and of particular relevance in RO systems that need to handle sensitive product - is low-shear pumping action, which here safeguards the integrity of the raw milk.

This advantage was recognised by the customer, as also was the ability to deliver liquid to the membrane smoothly with minimal pulsation, at selected constant flow rates and pressures. In this application the pump is required to operate at flows up to 18.8 l/min and pressures up to 32 bar.

In the Hydra-Cell pump these performance features are combined with compact build and very high pumping efficiency, reducing power requirement and overall dimensions of the pump/motor unit.

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