Garlock

Case Study: Improving Seal and Pump Life in Food Manufacturing

INDUSTRY

Food & Beverage – Commercial Food Processing

BACKGROUND

Pumping high fructose corn syrup (HFCS) is challenging due to its high viscosity, slight corrosiveness, and sensitivity to temperature and shear forces. Specialized pumps and corrosion-resistant materials are needed to handle its thick, syrupy nature and prevent damage. Moreover, maintaining strict hygiene is crucial to avoid contamination, with temperature control systems often needed to keep HFCS in its liquid state and prevent crystallization.

CHALLENGES FACED

The food manufacturing company faced several challenges with their positive displacement pumps and existing sealing solutions, including traditional mechanical seals, packing, and OEM pump seals. The HFCS was transported using positive displacement pumps that required continuous water flushing. The seals were prone to failure, leading to sugar crystal accumulation in the pump frame necessitating frequent maintenance and cleaning, which disrupted production efficiency.

Garlock was contacted to propose a comprehensive solution, as the customer was replacing mechanical seals multiple times a year, significantly straining maintenance resources.

OPERATING CONDITIONS

Pumps: Positive Displacement Pumps
Shaft Diameters: 1.062"-3.438"
Stuffing Box Pressure: 50-70 PSI
Temperature: 80°-100° F
Media: High Fructose Corn Syrup
Environment: Climate-Controlled Food Manufacturing Facility

SOLUTION AND BENEFITS

The Garlock P/S®-II Triple Lip Cartridge Seal was trialed for 9 months, showing significant improvements over previous seals. It exhibited zero external syrup leakage and operated efficiently with only an intermittent clean water flush, reducing maintenance frequency and minimizing production disruptions. The P/S®-II cut operating costs per pump by 85% due to its durable service life, reduced water usage, and ease of rebuilding. Fully converting all Positive Displacement Pumps at the facility led to estimated annual cost savings of $375,000.

For more information, please visit:
http://www.garlock.com

10.2024

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