

## KSS Causti-COR reduces phosphates in caustic recovery and wastewater streams

### Overview

A leading international manufacturer of sugar and starch fermentation products based in Italy uses ion exchange technology in its operation. With the production of starch, glucose syrups, grain alcohol, gluten, bran, and distillers' grains, the manufacturer noticed an increased level of phosphates in the spent caustic used for regeneration of the ion exchange column. These phosphates – originating from fertilizers used on the vegetables – were also creating pollution issues in the wastewater stream, which was ultimately routed to a municipal water treatment plant.

### Objective

The manufacturer sought an economic and environmentally friendly solution to reduce phosphates to less than 150 ppm at the wastewater treatment plant as well as recover and reuse spent caustic in their process.

### Solution

Identifying KSS as a leading membrane filtration company, the manufacturer took interest in the Causti-COR<sup>®</sup> Nanofiltration System. A pilot was installed for initial data gathering and performance testing, and soon thereafter a customized 3-stage system was built to recover the spent caustic and prevent phosphate pollution of the wastewater stream. The whole system operates continuously over 24 hours per day and is equipped to handle the variable production effluent volume between 925 and 1,320 gallons per hour (gph), or 3.5 to 5 cubic meters per hour (m<sup>3</sup>/hr).

The Causti-COR system is comprised of SelRO<sup>®</sup> nanofiltration spiral membranes and is available in six standard configurations treating volumes up to 8,300 gph (32 m<sup>3</sup>/hr). Custom engineered solutions are available for larger volumes. Smaller systems operate semi-automatically in a modified batch or batch mode, while larger systems operate automatically in a continuous mode. The Causti-COR system is designed to achieve up to 95% caustic recovery and the SelRO membranes are tolerant of pH levels from 0 to 14 and can withstand high concentrations of acids and bases.



### Achievements

The Italian-based manufacturer produces an effluent containing >13,000 ppm of phosphates, and with the installation of the Causti-COR® system, is achieving a permeate containing <50 ppm of phosphates. They are able to run continuously to meet production demands while reducing wastewater output and saving on operating costs by completely recovering and reusing caustic solutions for ion exchange regeneration. The purified phosphates are either sold or reused in the production process, further maximizing their operation. The manufacturer feels confident in the reliability of the system design and know-how demonstrated by KSS engineers since the very beginning of the project.

### Takeaways

KSS offers best-in-class advanced membrane systems to remove undesired pollutants and contaminants to reduce effluent output and negative environmental impact. Like this international manufacturer, and similar companies producing fermentation products may experience similar issues with phosphates from fertilizers and can benefit from the unique capabilities of the Causti-COR system.



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