

Crafting Sustainable Solutions: Innovating Membranes for Beer Filtration and Water Treatment and Reuse in Breweries

Breweries face critical challenges in wastewater management, water reuse, and beer filtration. This project aims to develop an innovative solution to these challenges, leveraging advanced microfiltration and ultrafiltration technologies. The approach integrates pleated and hollow fiber membrane modules with highly hydrophilic flat sheet polyethersulfone (PES) and polyvinylidene fluoride (PVDF) membranes. The membranes are engineered to effectively remove particulates, microorganisms, and impurities from liquid streams. Advantages of these advanced membrane technologies include superior contaminant removal, energy efficiency, enhanced water reuse, and improved beer filtration. This project aims to de-risk, optimize, and scale up Flexcim's membrane manufacturing processes.



RECIPIENT:

**Flexcim
Manufacturing
Services**



TOTAL BUDGET:

\$1,200,000



PROJECT DATES:

**AUG 2024 –
JUL 2026**



PARTNERS:

**Alley Kat Brewing
Co., Advanced
Water Research
Lab**



AI FUNDING:

\$450,000



PROJECT TRL:

**Start: 3
End: 6**

APPLICATION

The project focuses on development and implementation of novel flat-sheet and hollow fiber membranes for beer filtration and wastewater treatment in a brewery application. Beyond breweries, the scalability and versatility of the technology extend its potential to various industries requiring efficient filtration and water treatment solutions. From food and beverage to pharmaceuticals and beyond, these membranes offer versatile and adaptable solutions for diverse filtration needs.



PROJECT GOALS

The overarching objective of the project is to develop an Innovative Membrane System for breweries applications including beer filtration, wastewater treatment and water reuse. Specifically, there are three primary objectives:

- Develop high performance hollow fiber and pleated membranes specifically designed for beer filtration. These membranes will ensure the removal of particulates, microorganisms, and impurities, resulting in high-quality, clear, and consistent beer.
- Develop high performance hollow fiber and pleated membranes for wastewater treatment and water reuse applications. These membranes will address the challenges of brewery wastewater by effectively removing organic compounds, suspended solids, and nutrients, allowing for the treated water to be reused within the brewery operations.
- Build advanced infrastructure that includes key equipment such as membrane casting and spinning machines, and module assembly systems to produce novel high-performance membranes and cartridges, focusing on cost-effective and sustainable production methods to support Alberta’s industries while promoting environmental responsibility.

BENEFITS TO ALBERTA

The implementation of these membranes will have significant impacts and benefits for breweries and beyond:

- Supports brewery compliance with stringent environmental regulations by effectively treating wastewater and enabling water reuse.
- Lowers operational costs for users by reducing the need for freshwater resources and energy-intensive and chemical-dependent treatment processes.
- Efficient water reuse enabled by the technology will conserve valuable freshwater resources, reducing the burden on municipal water supplies and supporting water-scarce regions.
- Improved beer filtration ensures removal of contaminants that can affect taste, aroma, and shelf life, leading to high-quality beer production and enhanced customer satisfaction.
- Scalability and versatility make the technology suitable for various industrial applications beyond breweries, offering potential benefits in other sectors.
- Advanced manufacturing of novel membranes will allow Alberta industries to be the first to access the technology, fostering sustainable solutions and boosting competitiveness.



2 New
Products/Services



3 Project Jobs



100 Future Jobs



85-100 t/yr Future
GHGs Reduced

CURRENT STATUS

SEP 2024

Project recently kicked off.

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