PolyCera®

CASE STUDY

Industry: Pharma

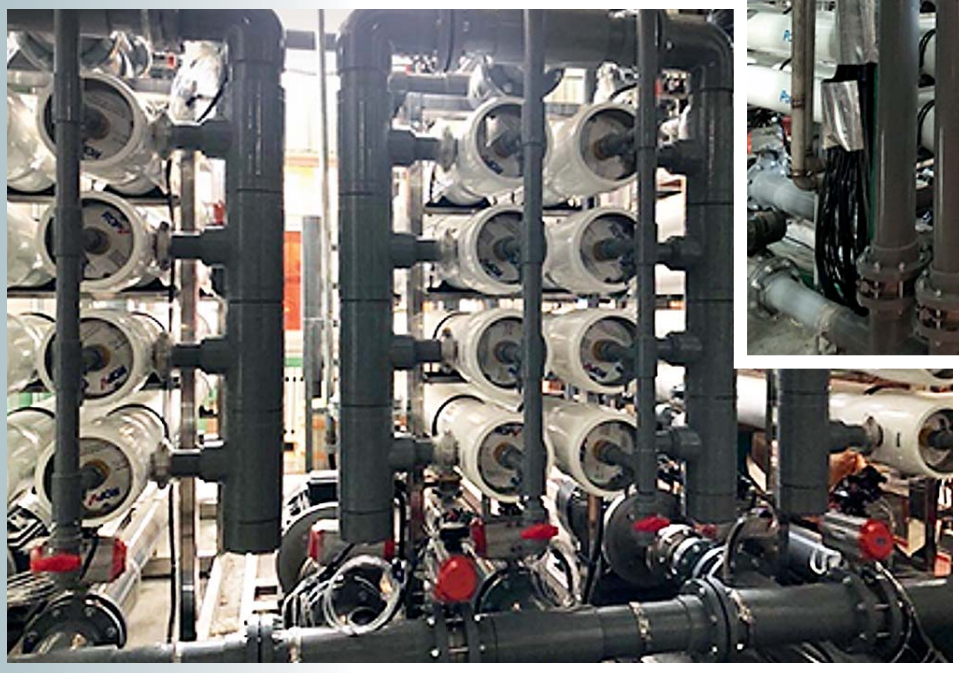
Precision Filtration of Fermentation Broth

Concentration and Purity for Pharmaceutical Applications Using PolyCera® Hydro UF

Application Overview

Precise filtration of fermentation broth is a critical step in pharmaceutical manufacturing, where product purity and yield directly affect efficacy and compliance. This project utilized PolyCera® Hydro ultrafiltration (UF) membranes in a pharmaceutical production line to enhance concentration performance while ensuring stable and clean operation. The system, commissioned with a capacity of 600 m^3/day, was designed to handle fermentation broth containing proteins, polysaccharides, and suspended solids at a low pH (~3) and within a temperature range of 5 to 45 °C.

PolyCera® Hydro UF system installed in a pharmaceutical facility, optimized for high-concentration fermentation broth processing.



Process Design

The system was configured for **batch-mode operation** with tight control over concentration levels and cleaning intervals. The filtration process includes:

Fermentation Broth Feed:
Fermentation broth containing a complex mix of organic components, solids, and nutrients enters the system.

PolyCera® Hydro UF Membrane Filtration:

- Retains and concentrates target components.
- Removes impurities while maintaining high flux and low fouling.

Batch Concentration Control:

- System runs in cycles to achieve the desired concentration.
- Cleaning is scheduled between batches to maintain long-term flux stability.

Cleaning Protocols:
Routine backwashing combined with periodic chemical cleaning restores membrane performance and prolongs service life.

Results

The operation of the PolyCera® Hydro UF system delivered the following results:

- **High Concentration Factor:** Achieved **>25x concentration** of fermentation broth, exceeding target specifications.
- **Consistent Membrane Performance:** Chemical cleaning effectively restored flux after prolonged use, enabling sustained throughput.
- **Stable Operation:** The system met operational and regulatory requirements for pharmaceutical production with minimal downtime.

Conclusion

The implementation of **PolyCera® Hydro UF membranes** in this pharmaceutical setting demonstrates their capability in **precision filtration of complex fermentation broths**. The system provided **high concentration performance, stable operation, and reliable cleanability,** supporting both product quality and operational efficiency.

This project confirms PolyCera®'s suitability for **high-value process filtration applications** in regulated industries such as pharmaceuticals.

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Left: UF feed; right: UF filtrate

Inlet view of fermentation broth during batch processing, showing the feed stream prior to ultrafiltration.

Process Flow

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