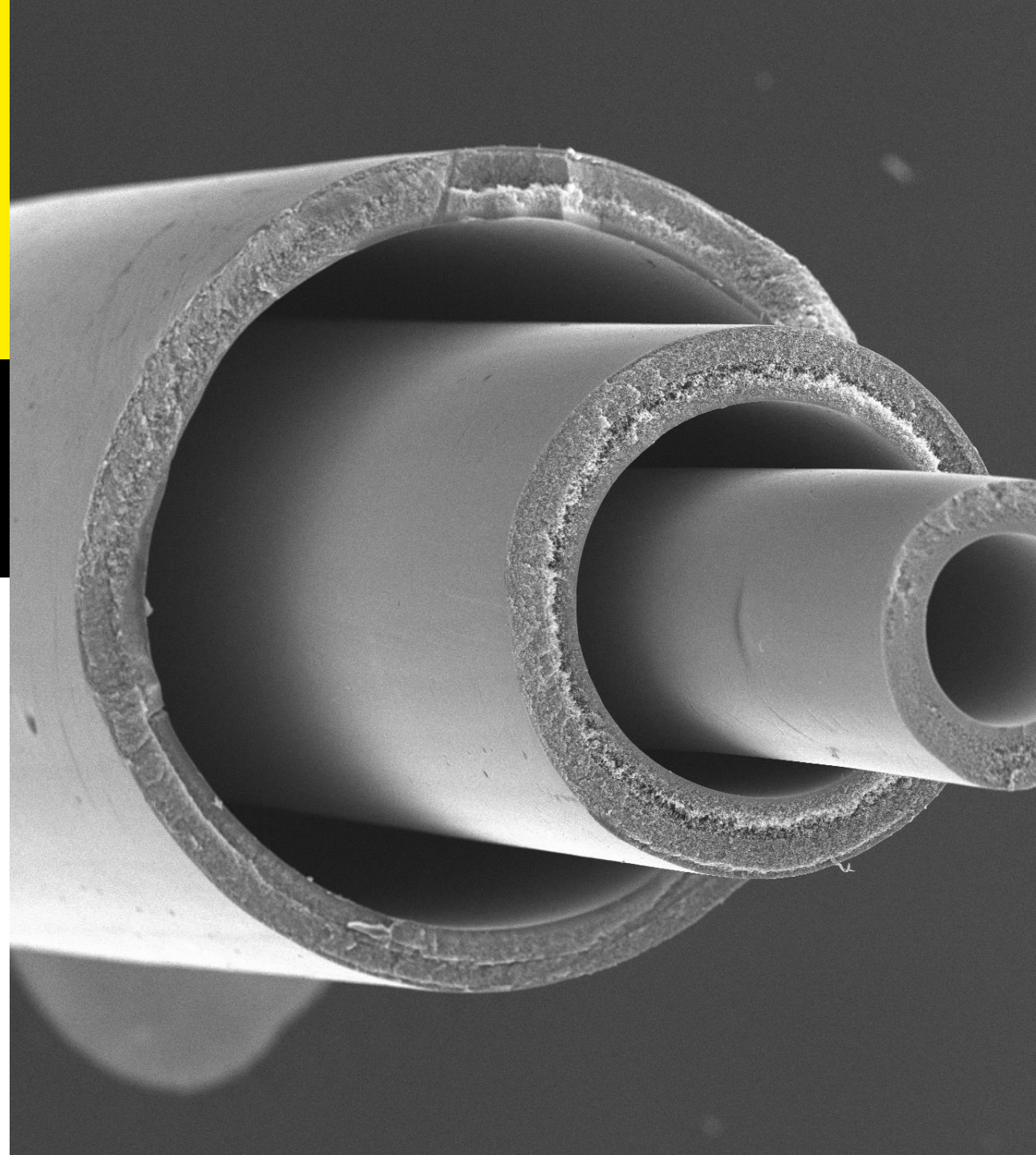


SARTORIUS

Simplifying Progress

Concentration of E.Coli Whole Cells

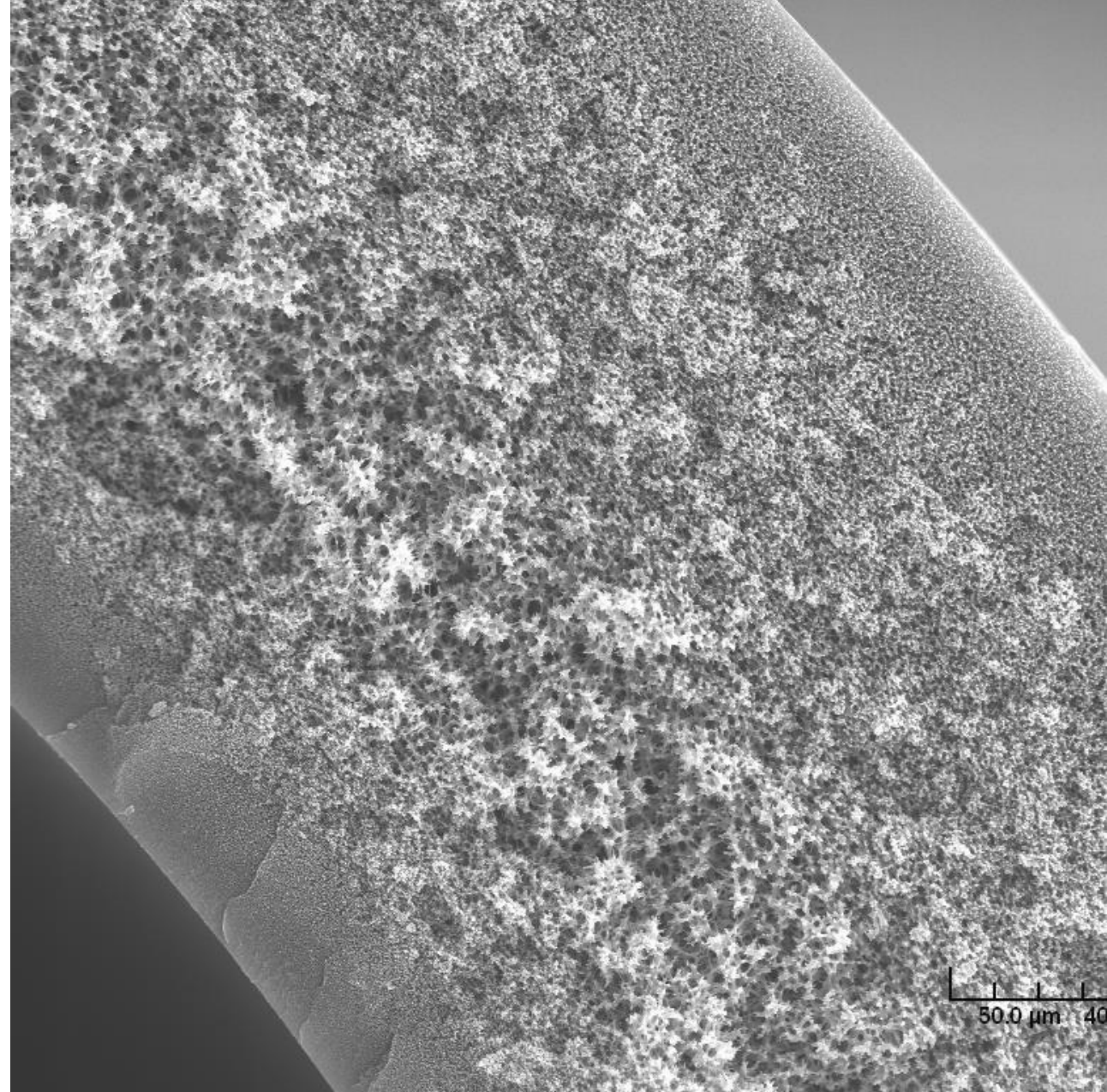
Bengt Person, Product Specialist Hollow Fiber TFF



Concentration of E.Coli whole cells
with Sartorius Hollow Fiber TFF,
utilizing a Levitronix Console LCO
600 system with a SU i600 pump

Concentration of E.Coli Whole Cells

- Introduction
- Objective
- Materials and Methods
- Results and Conclusions



Introduction

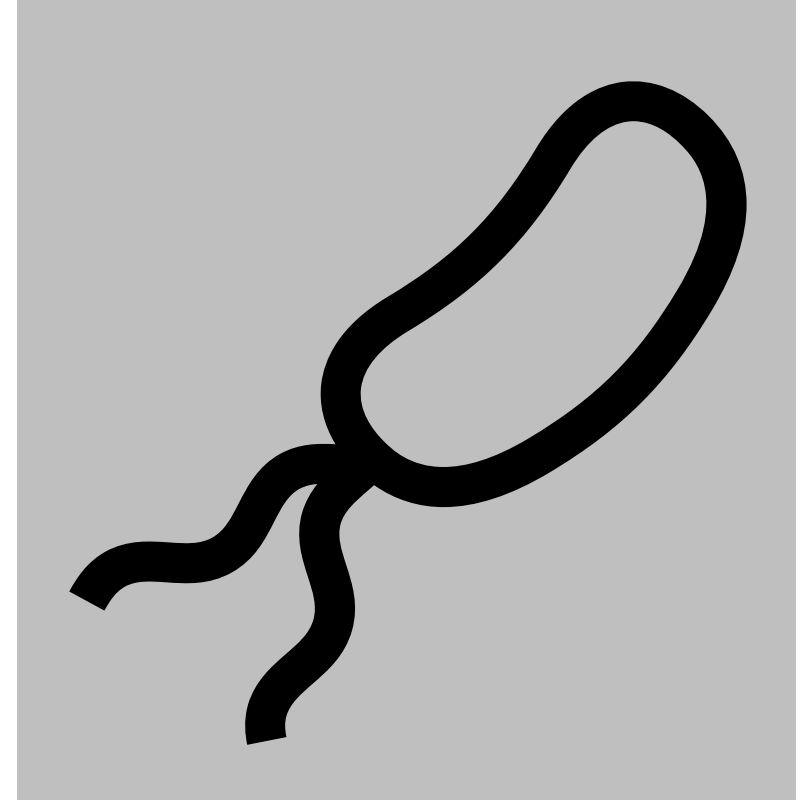
Our Hollow Fiber TFF Modules Enable Gentle and Fast Separation

Watch this video to find out more about the time and cost benefits that Sartorius' single-use Hollow Fiber filters can offer and how they can help to improve your processes.

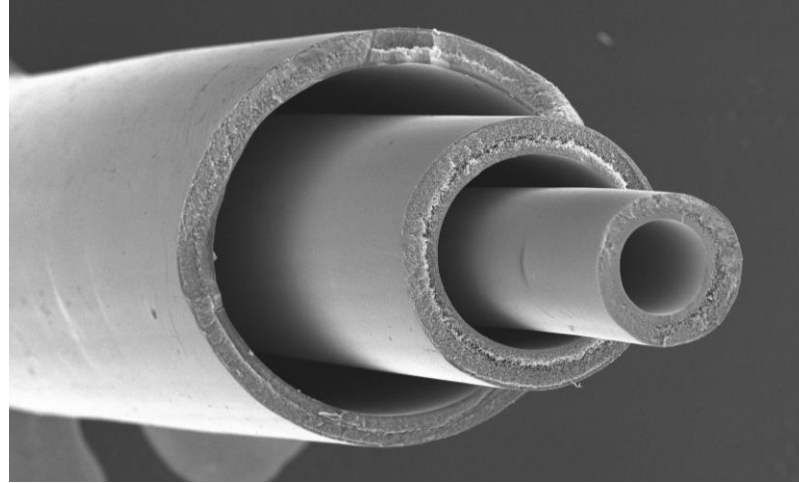
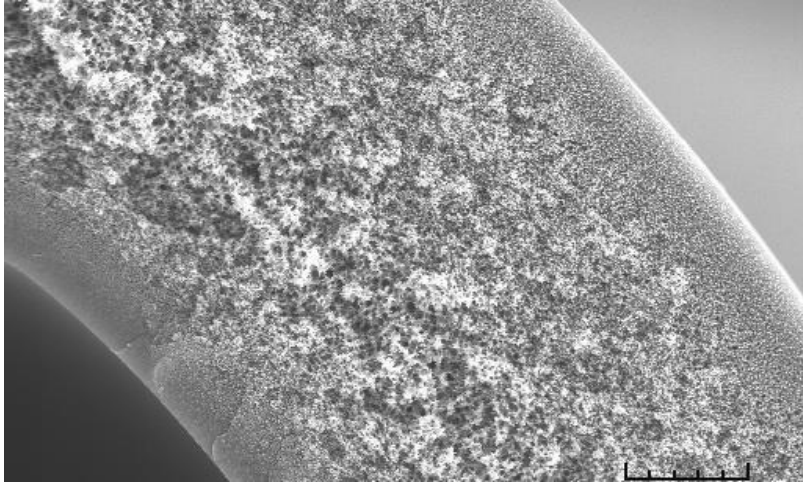
SARTORIUS

Achieve Outstanding Results in E.Coli Whole Cell Concentration

- Hollow Fiber TFF modules are the recommended format for processing of microbial and mammalian cells in upstream applications like cell harvest and cell clarifications.
- Sartorius offers complete systems and hollow fiber membrane modules for single use upstream cell processing and downstream concentration/diafiltration for biopharmaceutical and vaccine processes.



A Full Range of Ultrafiltration and Microfiltration Hollow Fibers



13 MWCO Offered

3kD, 5kD, 10kD, 30kD, 50kD, 100kD
300kD, 500kD, 750kD
0.1 μ m, 0.2 μ m, 0.45 μ m, 0.65 μ m

3 ID Fiber Diameters

0.5mm, 1mm, 2mm

Fully Scalable Modules

52cm² to 15.45m², from 10mL up to
1500L process volume

Benefit from Our Humectant Free Membrane

The Hollow Fiber Module Single-use Investigator 24"

- 750kD
- 1.0mm Fiber ID
- Module Diameter: 3.34 cm [1.32 in]
- Number of Fibers: 160
- Surface Area: 0.28 m²
- Filter Material: m-PES
- Connector Feed / Retentate: 1.5-inch TC
- Connector Permeate: 1/2-inch TC
- Gamma-irradiated

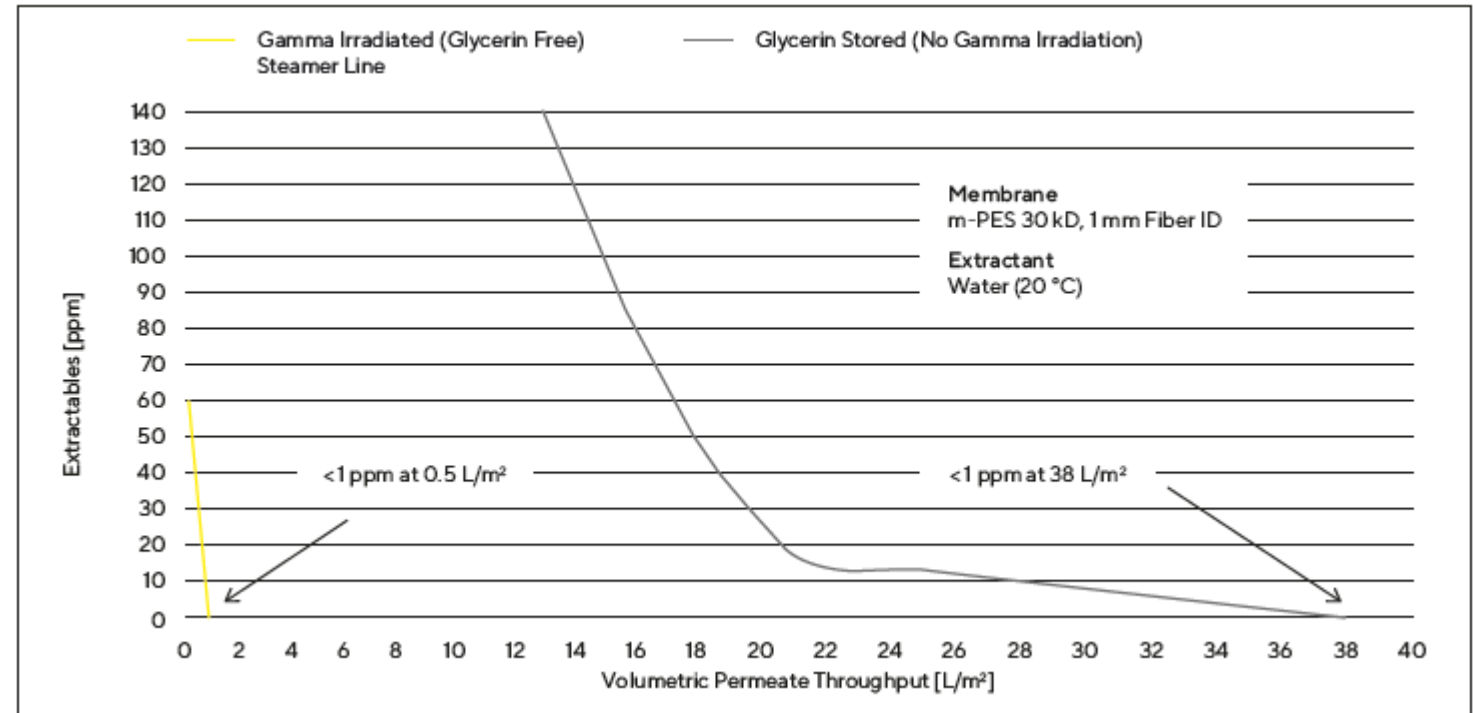
Humactant free membrane!



Reach <1ppm with Only Equilibration of 0.5 L/m²

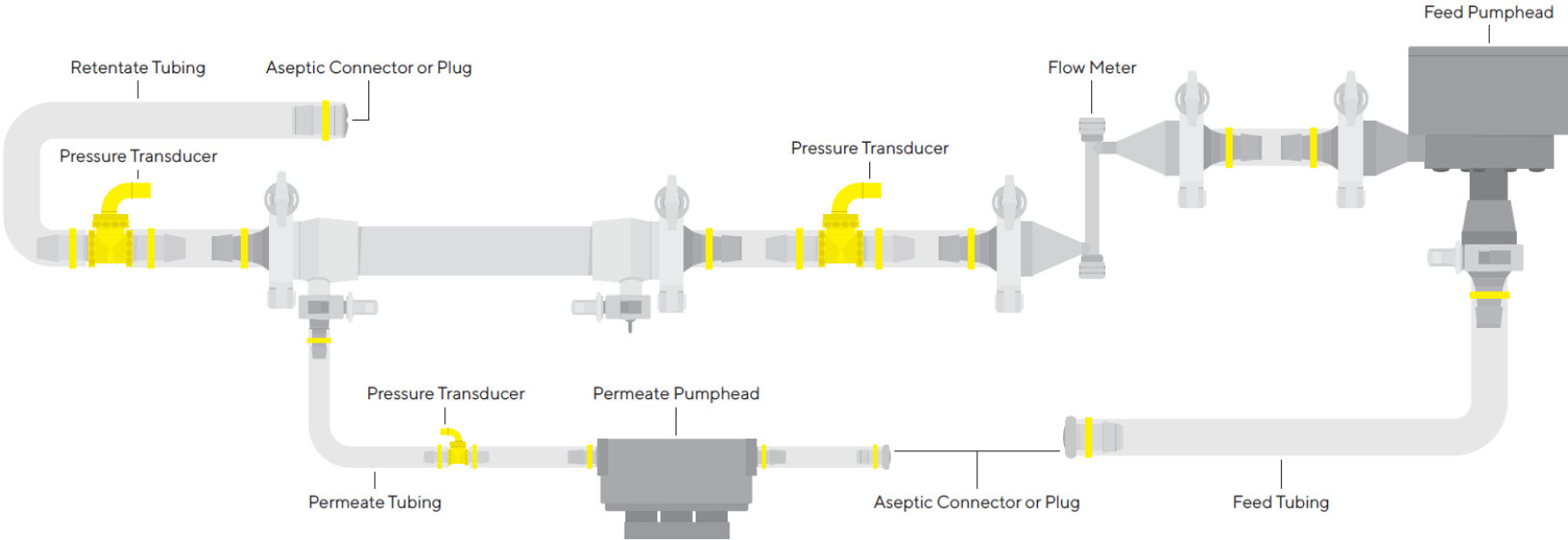
Properties of Sartorius single-use modified polyethersulfone (m-PES) Hollow Fiber Membrane

- Ready-to-use
- Gamma irradiated
- Low binding, antifouling membrane
- Very high permeability in Microfiltration membranes
- 100% integrity testing of the finished Hollow Fiber TFF modules and Flow Assemblies.
- Scalable from Lab to Manufacturing



Hollow Fiber TFF as Perfect Fit for E.Coli Concentration

- Single-use Investigator 24" FlowAssembly
- Levitronix LCO i600 Console system



Control System: Levitronix Puralev 600 with a i600 SU pump



Levitronix control system
3 Pressure inputs
1 Flow Meter input
Operate in Feed Pressure or Flow Control Mode.



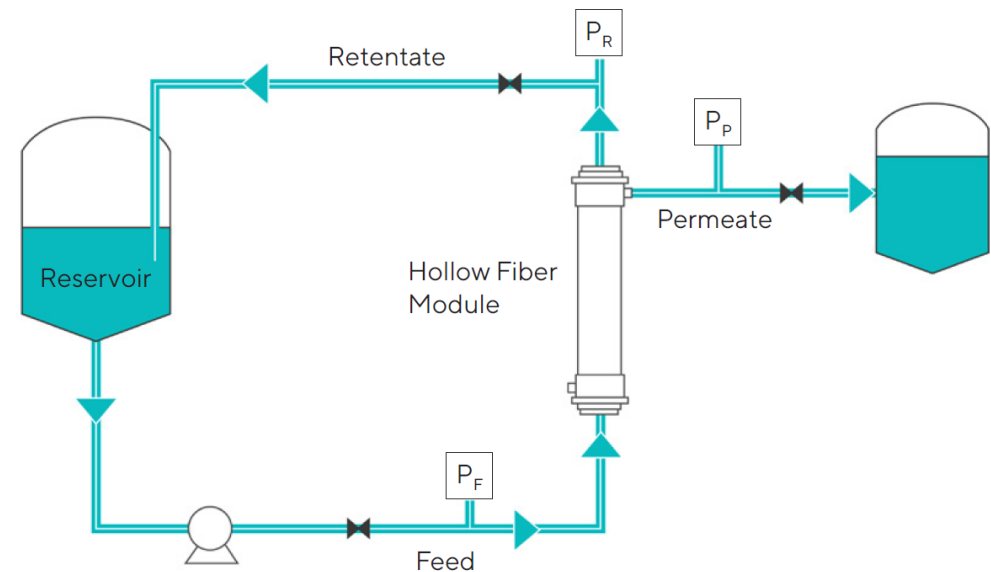
PuraLev i600 with SU pumphead
In addition, the following components were used:

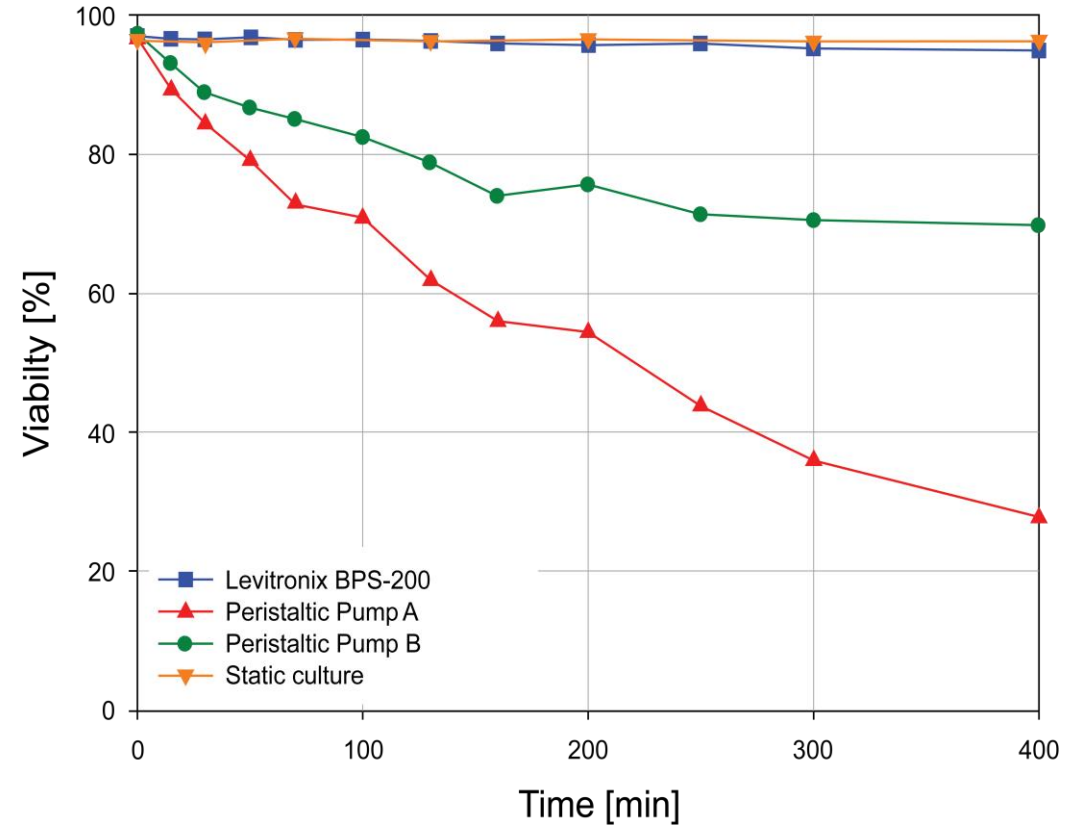
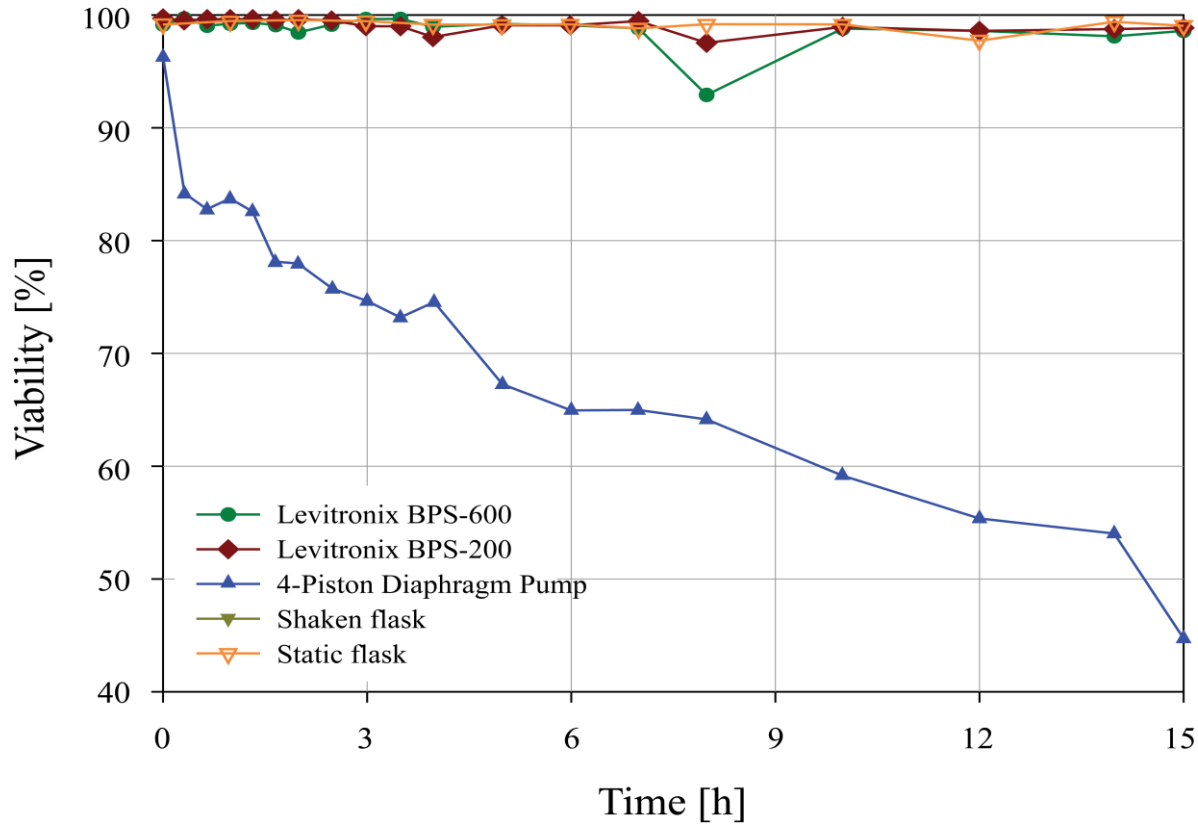
- LEVIFLOW LFS 03 SU flowmeter
- (3) Pendotech pressure sensors
- (2) AseptiQuick sanitary connectors.

Objective

Volume Reduction and Concentration of E.Coli whole cells.

- To concentrate a 9L E. Coli solution 3x
- Perform 4 diafiltration volumes at the end of the concentration, with maintained cell viability and a yield of >90%.





Results

Concentration of E.Coli whole cells.

Feed Characteristics:

OD:50-60

Batch Volume: 9L

Final Volume: 3 L

4 Diafiltration Volumes @
3L

Total Processed Volume:
18L

Operating Conditions:

Permeate Flow Control

Shear rate: 7,000 S⁻¹

Feed flow: 7,500 ml/min

Feed Pressure: 4-12 psi

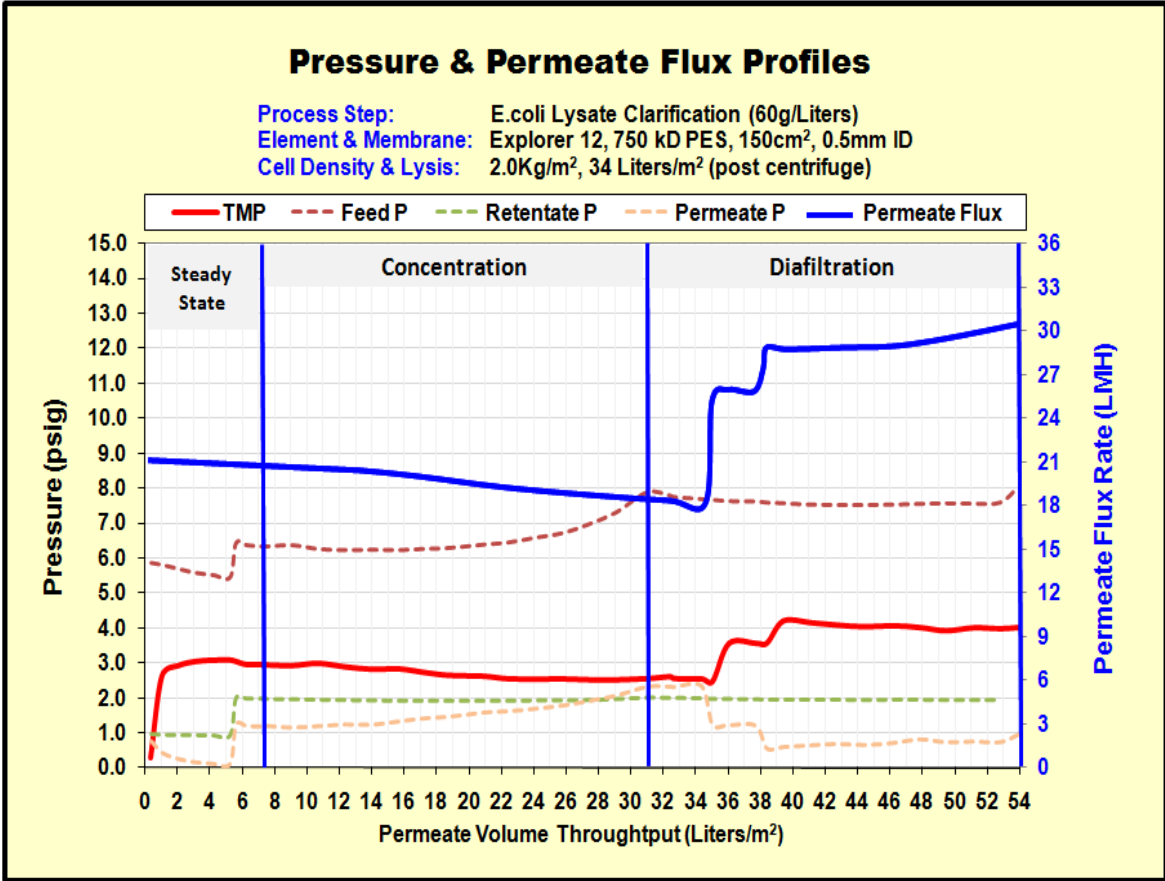
Retentate Pressure: 2-7

Permeate Pressure: > 1 psi

Permeate Flux: 20 LMH (90 ml/m²/hr)

Process Time: 3.5 hrs

E .Coli Concentration with Single-use Investigator 24” 750kD in 1.0mm Fiber ID



Hollow Fiber TFF is the Perfect Fit for E.Coli Concentration

A 9 L, E.Coli whole cell solution was concentrated 3X with 4 DVs in 3.5 hrs with a viability of >95%. The permeate flux was kept at 20 LMH throughout most of the concentration and recovery of E.Coli was >95%.

CrossflowExpert® Tangential Flow Filtration Made Simple



Module Size Calculator

Selects the optimum module sizes for your application based upon:

- Type of crossflow process
- Batch volume
- Process steps

Shear Rate Calculator

Determines the shear rate for:

- Sartorius's recommended crossflow
- Your specified crossflow

Process Time Calculator

Solves for process time based upon:

- Module selection
- Type of crossflow process
- Batch volume
- Process steps

Module Water Flux Calculator

Using your measured water flow rates and pressures you can calculate the normalized water flux of Sartorius

The CrossflowExpert® calculators make it simple to determine the modules and operating conditions specific to your crossflow filtration application.

Visit us!

www.sartorius.com/hollow-fiber-tff

Thank you!

Bengt Persson

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