COMPLETE
FILTRATION RESOURCES

From Sustainability to Profitability:

Advanced Membrane Technologies for Smarter Operations

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Agenda

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1. Short introduction to Complete Filtration Resources, CFR
2. Three differenet ways of optimising your membrane processing plants
   - Leanflux® **A Paradigm Shift in Trans Membrane Pressure Control**
   - ESA ATD (**A**nti **T**elescopic **D**evice)
   - Membrane replacement, correct selection, service agreement
   - Closing

INTRODUCTIONS

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LEIF B. IVERSEN

Senior Sales Manager

UFFE KALMEYER

After Sales Manager

Turnover 2024/25 >100 mill Euro

DAIRY INDUSTRY IMPACT

Approximately 100 specialists in USA, Netherlands and Denmark

- More than 1000 Dairy-related Filtrations Systems Worldwide;
- WPC 35, 60, 80, 85
- WPI 90 and Serum Protein Isolates
- MPC 85, MPI 90, and Low-lactose MPI
- Defatting of whey, whey concentrates and skim milk.
- Milk UF and Standardization
- Bacteria removal skim milk
- Acid Whey Processing
- Demineralization
- Specialty Product Fractionations
- Water and CIP-Recovery Systems

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Leanflux ® **A Paradigm Shift in Pressure Control**

Leanflux® is crossflow membrane technology, for low pressure applications, i.e. UF and MF systems, based on standard cross flow technology

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LEANFLUX®

LeanFlux® is a method developed for low pressure technologies i.e. ***MF & UF***, using polymeric spiral wound membranes.

LeanFlux® is providing potential for **substantial reduction on CAPEX** (15-60% depending on application)

LeanFlux® is a unique construction method using only **known flow principles** around the modules & membranes.

LeanFlux® effectivly allows reduced no. of elements per pressure vessel i.e. ***improved membrane area efficiency.***

LeanFlux® is providing ***considerable reductions on OPEX cost & CO_2 emission*** (15-80% depending on application)

LeanFlux® concept allows service friendly and compact loop designs and ***reduced plant footprint.***

LeanFlux® is allowing ***low and controllable Transmembrane Pressures (TMP)***, ”independent” from the required cross flow (dP) and baseline pressure.

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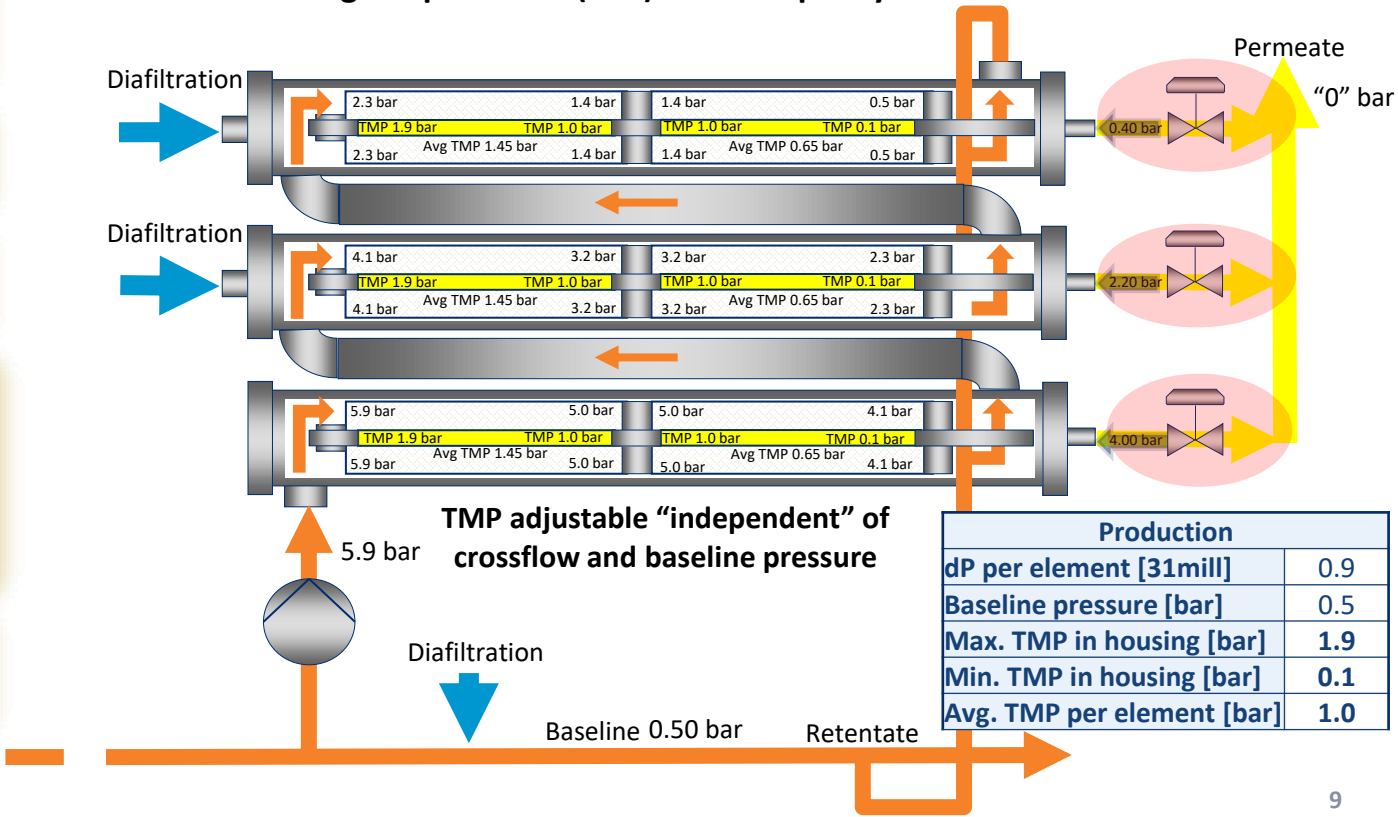
LeanFlux® UF - Production TMP - ”Start”

- Active TMP regulation creates constant capacity
- All membrane area in use from start to end
- Active TMP regulation replace permeate recirculation
- Lower TMP ≈ lower flux
  Lower flux ≈ less fouling
  Lower flux ≈ less recirculation volume required (keeping dP)
  Less recirculation ≈ less kWh used
- *Lower TMP ≈ reduced dP requirements*

❑ **The TMP is driving the permeate (flux) i.e the capacity!**



Production	
dP per element [31mill]	0.9
Baseline pressure [bar]	0.5
Max. TMP in housing [bar]	1.9
Min. TMP in housing [bar]	0.1
Avg. TMP per element [bar]	1.0

Leanflux® **A Paradigm Shift in Pressure Control**

In standard system the permeate side of the system is pressure less, in Leanflux® the permeate back pressure is adjustable, making it possible to adjust the **Trans Membrane pressure**, and thereby the permeate flow.

The **result** of those changes; **better area utilisation +25-50%,** i.e. smaller area than standard systems. Leanflux ® systems are much cheaper to own and run. **Operation cost 15-80% cheaper** than standard systems.

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What LeanFlux®, TMP on UF actually does.

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"In a classic low pressure system, TMP is just a side-effect of the pressure drop through the elements. That means the inlet runs with too high TMP and too high flux, which causes fouling, while the outlet runs with too little TMP and too little flux, so part of the membrane area is basically under-used.

What LeanFlux®, TMP on UF actually does.

LeanFlux® changes that completely.

Here, we actively control TMP by adding permeate back-pressure. That allows us to set the exact TMP we want — and keep it constant from production start to finish. When TMP is stable and low, flux is stable and low, and the whole membrane area is used more effectively.

➡ Less area required

The result is simple: constant capacity, less fouling, no need for permeate recirculation, and lower water and energy use.

LeanFlux® keeps the system in the optimal operating window from start to end.

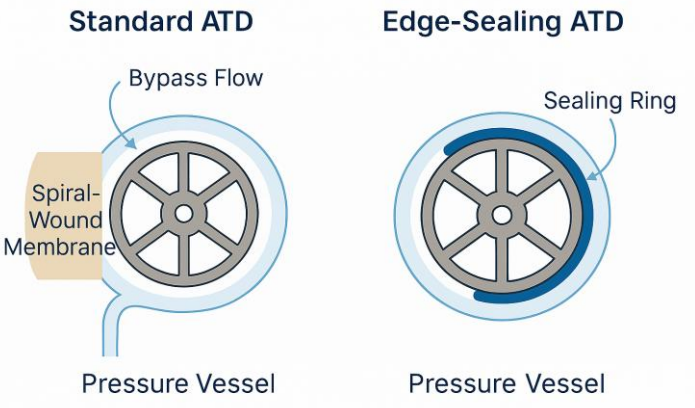
Why ESA ATDs, and what are they?

EDGE-SEALING ANTI-TELESCOPING DEVICE

ENERGY SAVING ANTI TELECOPING DEVICE

An ESA ATD, is an ATD that is equipped with a **lipseal,**

-the lip seal seals between the housing and the ATD, preventing bypass and thereby optimising the efficieny of the circulation flow leading to **upto 15% less OPEX cost**



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MEMBRANE REPLACEMENT

WHY IS RIGHT CHOICE REPLACEMENT MEMBRANES IMPORTANT?

- Optimised separation, different suppliers =different separation
- Different effective area, can be +/-20% between suppliers
- Different durability, CIP optimisation
- Get Unbiased Expert Advice – Optimization, troubleshooting

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Closing:

Smarter Filtration. Smarter Operations. Higher Profitability.

Leanflux • ESA ATDs • Right membrane selection

Sustainability isn’t a target — it’s a business strategy.

With the right membrane technology, it becomes your competitive advantage.

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THANK YOU
FOR YOUR TIME TODAY

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