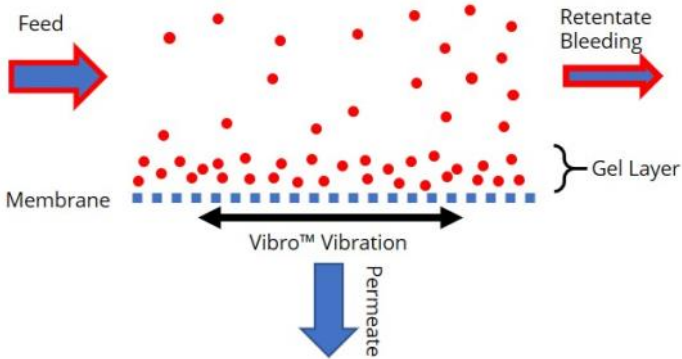
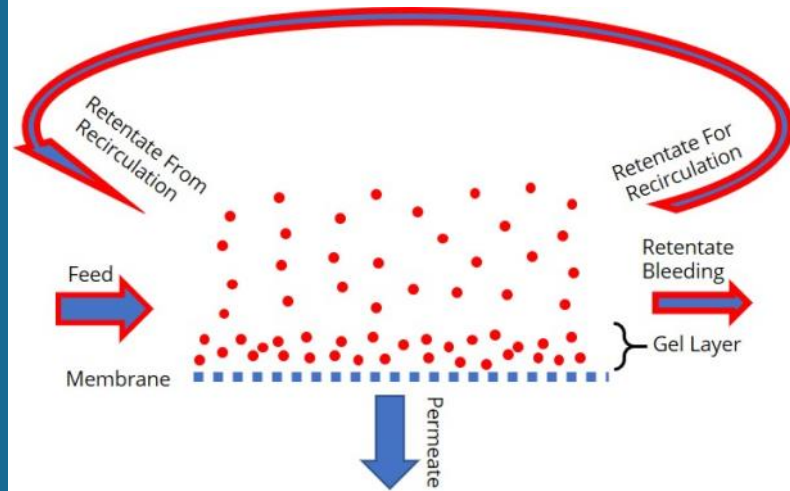


Free Flow Plate™ Technology

unique micro- and ultrafiltration solutions by **SANI Membranes**

Cross Flow Filtration

Cross flow filtration with Free Flow Plate™ technology is engineered to be highly sanitary, low fouling, reduce energy consumption and improve separation. The membrane is kept clean by cross flow induced turbulence.



Vibro™ Filtration

In Vibro™ Filtration, the membrane is kept clean by vibration-shear induced turbulence in a patented design. With Free Flow Plate™ technology the solution is engineered to be simple, robust and highly sanitary. Vibro™ Filtration has extremely low energy consumption and greatly improved separation.

Free Flow Plate™ Technology

Free Flow Plate™ technology is conceived with excellent sanitary function as the main focus. The result is a very open design with no flow dead areas and extremely low pressure losses in cross flow settings. The design is fully drainable of both retentate and permeate and very easy and fast to clean.

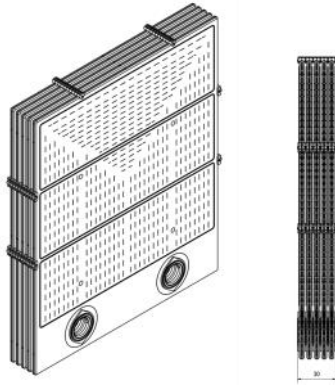
Free Flow Plate™ technology is built around a hollow polymer plate where the membrane is welded onto. The Free Flow Plates™ are then welded together to form a rigid membrane element. Filtration takes place from the outside of the plate through the membrane to the inner hollow part of the plate.

The HP1 Free Flow Plate™ Module key features

- The HP1 is 2,5 m² MF or UF membrane, supplied in pressure channel housing
- The HP1 can be stacked vertically or horizontally
- The HP1 has free flow
- The HP1 has individual permeate outlets from each module
- The HP1 has no feed or permeate spacers
- All bonding is done by welding



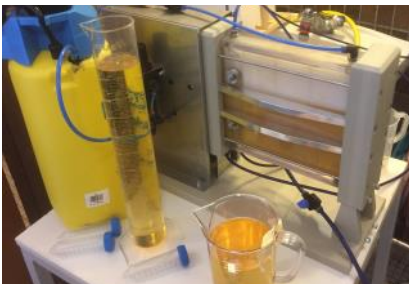
> Reusable PP, no glues, no spacers, including housing



The HPL Free Flow Plate™ Laboratory Element key features

- The HPL is equipped with 0,35 m² MF or UF membrane
- The HPL is for pilot testing and Vibro™-L
- The HPL has free flow
- The HPL has individual permeate outlets from each module
- The HPL has no feed or permeate spacers
- All bonding is done by welding

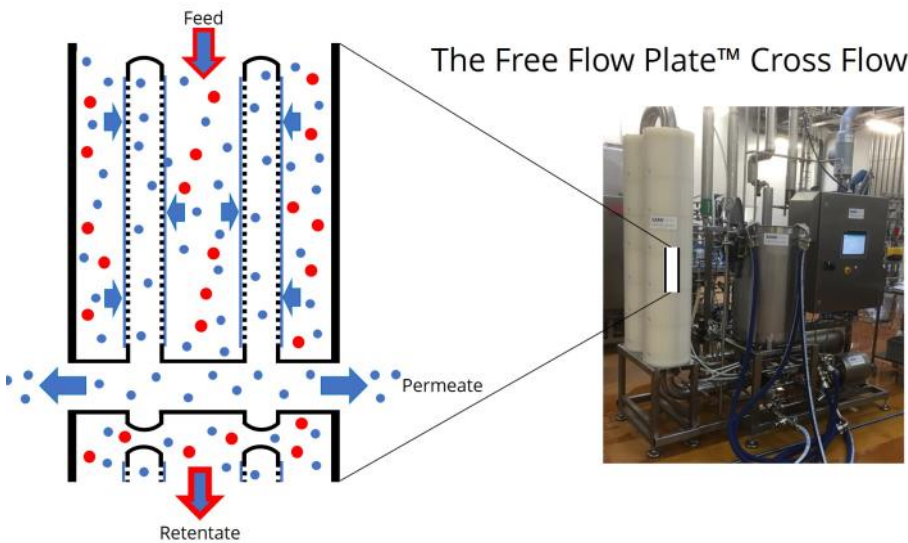
> Reusable PP, no glues, no spacers



Free Flow Plate™ technology systems comes in all membrane area sizes from 0,35 m² benchtop models over 2 - 60 m² pilot testing units to industrial plants with thousands of square meters of membrane area.

Free Flow Plate™ Technology in Cross Flow Filtration

SANI Membranes Free Flow Plate™ technology is a new unique way of making energy efficient and sanitary cross flow filtration. The Free Flow Plate™ technology eliminates many of the disadvantages of conventional cross flow filtration systems because it is engineered with a sanitary focus from the initial idea was conceived.



Sanitary - The simple and open design makes the module very sanitary – Fully drainable, easy to wash and with no flow dead areas

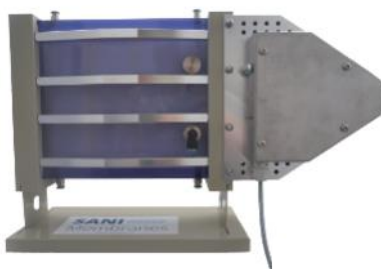
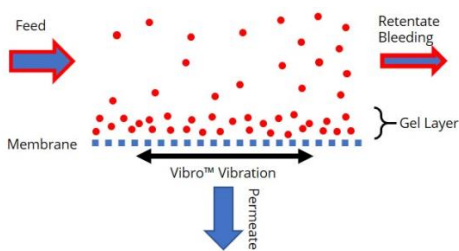
Energy Efficient - The simple and open design makes the pressure loss in cross flow operation very minute - Highly energy efficient

New processes - Low pressure loss means very uniform TMP, which leads to very sharp cut-offs
- New products are made possible

Free Flow Plate™ Technology in Vibro™ Filtration

A unique and disruptive new patented filtration device for micro- and ultrafiltration with unimpeded flux and the sharpest cut-offs

Vibrating motion of the membrane relative to the media creates turbulence at the membrane surface. The turbulence keeps the gel layer from growing. There is no need for a high shear recirculation pump creating product loss and non-uniform TMP's.



Compact and Mobile - The Vibro™ systems have a small footprint and are very lightweight and mobile

Energy Efficient - Creating turbulence by vibration is extremely energy efficient. A mere fraction of traditional cross flow. Cooling NOT needed

New Processes - No fast cross flow pump means uniform TMP, sharp cut-off, no product ruining cross flow pump, high concentration in one unit.

Sanitary - fully drainable, easy to wash and with no flow dead areas

Easy to use - Easy and simple operation of all functions insures good reliable filtration

Visible Process, Vibro-L - The membrane is fully visible during operation and cleaning





Unique Operation key features of the Free Flow Plate™ Module

- Free Flow – 1.7mm membrane to membrane distance
- Energy efficient – minimized pressure loss reduces energy consumption by 30-85%
- Very uniform TMP throughout the system – sharper cut-off
- Can handle very difficult feeds with high viscosity, high solids loading etc.
- Fully Drainable – no product loss

> **Energy efficient, higher concentration, sharper cut-off**

Unique Sanitary key features of the Free Flow Plate™ Module

- Open and Clean design – Sanitary
- No feed or permeate spacers – Sanitary
- No flow dead areas - Sanitary
- Drainable - faster CIP / more production time
- Drainable - reduced water & chemical consumption
- Permeate side can be CIP cleaned

> **Shorter cleaning time, less water & chemicals**

