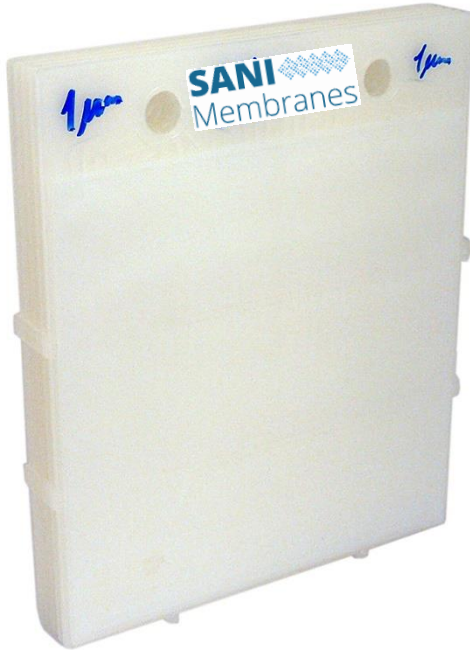


Hollow Plate™ Pilot Element - HPP

The Sani Membranes Hollow Plate™ Pilot Element is a fully fused membrane element consisting of a small stack of Sani Membranes hollow plates, bonded together and ready to use in the Sani Membranes pilot equipment line (HPPM06, HPPM12, HPP-Vibro etc.). The Hollow Plate™ Pilot Element is from start designed with sanitary applications in mind. The only material used is polypropylene and all bonding of plates and membranes are done with welding techniques, no glues or bonding materials are used. The Hollow Plate™ Pilot Element can be equipped with virtually any MF or UF membrane.



The Hollow Plate™ Pilot Element – HPP



The Hollow Plate™ Pilot Element mounted in a MF/UF pilot plant

- The Hollow Plate™ Pilot Element has a very low cross flow resistance - this secures low energy consumption and optimal membrane flux in a very sanitary element.
- The Hollow Plate™ Pilot Element has a very uniform trans membrane pressure (TMP) - this ensures sharper membrane cut off.
- The Hollow Plate™ Pilot Element can operate at very low and uniform trans membrane pressures (TMP) - this gives you the possibility of new applications.
- The membrane surface of the Hollow Plate™ Pilot Element is visible during operation in our pilot units – this gives direct insight into fouling and cleaning.
- The membrane to membrane free flow distance is 1,7mm – this leads to unprecedented CIP efficiency and the ability to handle difficult feeds with high viscosity and high solids loading.
- No feed spacers are used to promote turbulent flow – this means no fouling promoted by feed spacers.
- The Hollow Plate™ Pilot Element has an integrated and open permeate channel design - this means that the retentate as well as the permeate can be drained completely by gravity alone and leads to shorter CIP cycles, less water usage, and NO product loss (i.e. very little white water in dairy).
- The integrated design of the permeate channels gives you the possibility of CIP cleaning both the feed and permeate sides effectively.
- The Hollow Plate™ Pilot Element operates at pH 1-14 and at temperatures up to 85°C, practically limited by the mounted membrane or filter material.
- The Hollow Plate™ Pilot Element has a membrane area of 0,35 m² and can be fitted with virtually any commercially available membrane.
- The only material used in the Hollow Plate™ Pilot Element is polypropylene.
- The Hollow Plate™ Pilot Element conforms to FDA materials and sanitary standards; No glues or bonding materials are used to assemble the HPP.

Hollow Plate™ Pilot Elements makes up-scaling to plant size easy.

- The Sani Membranes' Hollow Plate™ Pilot Element is easily mounted into our MF / UF Pilot units, and virtually any type of membrane or filter can be tested.
- The function of the Hollow Plate™ Pilot Element is the same as in a full-size plant utilizing the Hollow Plate™ technique.
- The SANI-Vibro uses one element, that is easily exchanged or cleaned in place.
- The Hollow Plate™ Pilot Element can also be used in customized systems. All fittings etc. are readily available.

The HPP is available in 3 different materials depending upon application.

- Sani Membranes' standard material Polypropylene Nature is for sanitary applications with CIP below 75°C.
- Sani Membranes' water material Polypropylene Gray is for all water applications with CIP below 75°C.
- Sani Membranes' high temperature material Polypropylene HT is for sanitary applications with high temperature CIP (up to 85°C).

| Hollow Plate™ Materials | | | | | |
|-------------------------|------------------|----------------------|-------------|------|-----------|
| Code | Name | Material | Application | pH | Max-Temp. |
| S | Standard | Polypropylene Nature | Sanitary | 1-14 | 75°C |
| W | Water | Polypropylene Gray | Water | 1-14 | 65°C |
| H | High Temperature | Polypropylene HT | Sanitary | 1-14 | 85°C |

| Module Data and Operating Conditions | |
|---------------------------------------|---|
| Generic Design | Hollow Plate™. Fused Polypropylenes |
| Membrane Type | Most organic membranes (MF, UF, NF, RO) and other filter types (woven, sintered etc.) |
| Membrane Area | 0,35 m ² |
| Dimensions (L x W x H) | 242mm x 30mm x 202mm |
| Viscosity Range, Apparent | 1-1000 cP (e.g. Cream Cheese+) |
| Temperature Range | 5-85°C * |
| pH Range | 1-14 * |
| Cross Flow Velocity at Turbulent Flow | 0,9 m/s, recommended CF 1,3 m/s (Water) |
| Operating Pressure | 0-10 bar |
| Free Chlorine | Membrane dependent* |

* Depending on membrane specifications

The HPP can be equipped with your membrane of choice. SANI Membranes have a line of standard MF and UF no-name membranes which are on limited stock. Most commercial available brand name membranes can however also be used with the HPP. Please, do not hesitate to contact us with your membrane wishes.

| Standard Membranes* | | | | | | | | |
|---------------------|---------|----------|-------|-----------------|--------------------------------|---------------------|------|-----------|
| Code | Name | Producer | Type | MWCO/ Pore Size | Membrane Material | None-woven material | pH | Max-Temp. |
| UF5KD | No Name | | UF | 5.000 Da | Polyethersulfone (PES) | Polypropylene (PP) | 1-13 | 75°C |
| UF10KD | No Name | | UF | 10.000 Da | Polysulfone (Hydrophilic PS) | Polypropylene (PP) | 1-13 | 75°C |
| UF25KD | No Name | | UF | 25.000 Da | Polysulfone (PS) | Polypropylene (PP) | 1-13 | 75°C |
| UF50KD | No Name | | UF | 50.000 Da | Polyvinylidene fluoride (PVDF) | Polyethylene (PE) | 2-11 | 55°C |
| UF300KD | No Name | | UF | 300.000 Da | Polyethersulfone (PES) | Polyethylene (PE) | 2-11 | 55°C |
| UF800KD | No Name | | UF/MF | 800.000 Da | Polyvinylidene fluoride (PVDF) | Polypropylene (PP) | 2-11 | 55°C |
| MF2 | No Name | | MF | 0,2 µm | Fluoropolymer | Polypropylene (PP) | 1-11 | 60°C |
| MF5 | No Name | | MF | 0,5 µm | Fluoropolymer | Polypropylene (PP) | 1-11 | 60°C |
| MF8 | No Name | | MF | 0,8 µm | Fluoropolymer | Polypropylene (PP) | 1-11 | 60°C |

*Our standard 'no name' membranes are always on limited stock (Please ask if your preferred membrane specifications are not included on the list)

| Brand Membranes* | | | | | | | | |
|------------------|--------|----------|-------|-----------------|--------------------------------|---------------------|------|-----------|
| Code | Name | Producer | Type | MWCO/ Pore Size | Membrane Material | None-woven material | pH | Max-Temp. |
| Fr pht | Synder | | UF/MF | 800.000 Da | Polyvinylidene fluoride (PVDF) | Polypropylene (PP) | 2-11 | 55°C |
| LX | Synder | | UF | 300.000 Da | Polyethersulfone (PES) | Polyethylene (PE) | 2-11 | 55°C |
| BN | Synder | | UF | 50.000 Da | Polyvinylidene fluoride (PVDF) | Polyethylene (PE) | 2-11 | 55°C |
| BY | Synder | | UF | 100.000 Da | Polyvinylidene fluoride (PVDF) | Polyethylene (PE) | 2-11 | 55°C |

*Examples of brand membranes we can supply (Please ask if your preferred membrane is not included, most commercial available membranes can be supplied)

