Aquaporin Inside® HFFO® 3012-25-08

Hollow Fiber Forward Osmosis module

High rejection of difficult compounds

Low specific reverse salt flux

High recovery of water

Low footprint due to high packing density

PRODUCT TYPE

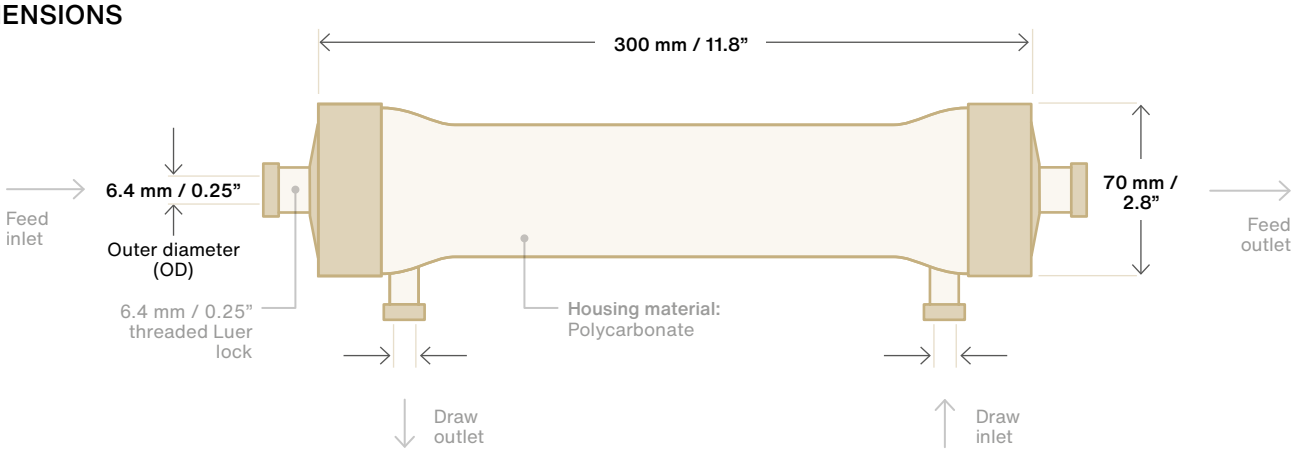
The Aquaporin Inside® HFFO® 3012-25-08 module is designed for Forward Osmosis (FO) applications. Biomimetic hollow fiber module comprising an active layer of polyamide thin film composite (TFC) with integrated aquaporin proteins. The addition of aquaporin water channels into the rejection layer makes the Aquaporin Inside® FO membrane capable of rejecting difficult contaminants and preserving valuable components. The use of hollow fibers allows for a very high packing density.

PRODUCT SPECIFICATIONS

Product name	Fiber ID	Membrane area	Water flux	Specific reverse salt flux
HFFO® 3012-25-08 module	**0.20 mm**	**2.3 m^2 24.7 ft^2**	**11 ± 1.5 LMH**	**0.15 ± 0.05 g/L**

The stated product performance is based on following testing conditions: 0.5 M NaCl (2.9 %) draw vs DI water (FO mode), temperature: 25°C (77°F), single pass mode, counter-current flow, feed flow rate: 60 LPH, draw flow rate: 25 LPH, transmembrane pressure (TMP) feed to draw: 0.2 bar (2.9 psi).

ELEMENT DIMENSIONS



RECOMMENDED OPERATING CONDITIONS

Operating mode	**Counter-current flow, inside-out**
Transmembrane pressure (TMP) feed to draw	**0.2 bar / 2.9 psi**
Temperature range	**5-30°C / 41-86°F**
pH range	**3-10**
Pre-filtration[a]	**≤ 50 µm**

[a] The optimal pre-filtration is application dependent.

[b] Under certain conditions, the presence of free chlorine and other oxidizing agents will cause premature membrane failure. Since oxidation damage is not covered under warranty, Aquaporin A/S recommends removing residual free chlorine by pre-treatment prior to membrane exposure.

[c] Refer to cleaning guidelines in the User Manual.

MAXIMUM OPERATING CONDITIONS

Transmembrane pressure (TMP) feed to draw	**≤ 4 bar / 58.0 psi**
Feed inlet pressure	**≤ 4 bar / 58.0 psi**
Draw inlet pressure	**≤ 2 bar / 29.0 psi**
Max. particle size	**≤ 50 µm**
Free chlorine tolerance[b]	**< 0.1 mg/L**

CLEAN-IN-PLACE (CIP)[c]

Temperature	**≤ 50°C / 122°F**
pH range	**2-11**
Pressure	**≤ 0.5 bar / 7.3 psi**
Duration	**≤ 20 min**

ADDITIONAL INFORMATION

- Module can be operated in vertical and horizontal position.
- It is recommended to rinse the module for 30 min, prior to first use.
- It is advisable to pre-treat the feed solution to remove suspended solids. Particles might damage the fibers and possibly cause a decrease in performance.
- Run feed solution prior to draw solution to avoid osmotic drying of the membrane.
- Do not allow the module to run dry as this will compromise the membrane performance.
- Immediately flush the module on feed side with clean water for ≥ 30 min after use (draw side connections open).
- The module can be stored at room temperature, but preferred storage is at 4°C.
- Keep out of direct sunlight.
- To prevent biological growth during prolonged system shutdowns, the module should be immersed in a preservative solution. Rinse thoroughly before re-use.
- Keep the module moist at all times after initial wetting.
- The information provided in this document is for informative purposes only. It is the users own responsibility to ensure appropriate usage of this product. Aquaporin A/S assumes no obligation, liability or damages incurred for the misuse of the product or for the information provided in this document. This document does not express or imply any warranty as to the merchantability or fitness of the products.

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