INTEGRATED ULTRAFILTRATION [i-UF]

Autoscreening & Ultrafiltration Stages Integrated in the same vessel

Next Generation of UF

- LOWER CAPEX & OPEX
  Easier, faster and cheaper maintenance

- SHORTER PROJECT LEAD TIMES
  No need for UF Building

- REDUCED FOOTPRINT

- UNLIMITED DESIGN PRESSURE

UF QUALITY

Material’s availability: FRP/GRP SS CSRL

Made with Dow Technology
Next generation of UF

The i-UF represents the natural evolution of UF filtration, where the integration of the screening and membrane filtration in a single vessel strengthens the footprint, pressure rating and robustness benefits of vessel contained UF.

The i-UF vessel design and manufacturing in FRP/GRP allows installing the system outdoors. FRP has proven to have a perfect corrosion resistance behaviour.

EPC’s
Decreases significantly

END USERS
Decreases significantly

Technology Description

i-UF systems combine the screening and UF stages in a single vessel. Feed water flows across the strainer in an in/out direction, reaching the membrane chamber.

The vessel internals are designed for out/in UF configuration and can include air scouring. Both stages can be cleaned at the same time or individually.

The UF is BWed or CEBed as in conventional systems and the screen is cleaned using a combination of BW and brushing.

The screen tube (screen, brush and propeller) can be extracted and replaced easily. Similarly to a conventional cartridge filter, the cartridges can be accessed from the top flange and individually tested and replaced.
# i-UF Models

## MEDIUM CAPACITY

<table>
<thead>
<tr>
<th>Model</th>
<th>i-UF 5</th>
<th>i-UF 7</th>
<th>i-UF 9</th>
<th>i-UF 15</th>
<th>i-UF 19</th>
<th>i-UF 24</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production (m³/h)¹</td>
<td>10-27</td>
<td>14-38</td>
<td>18-49</td>
<td>30-82</td>
<td>38-104</td>
<td>48-132</td>
</tr>
<tr>
<td>No. of UF modules</td>
<td>5</td>
<td>7</td>
<td>9</td>
<td>15</td>
<td>19</td>
<td>24</td>
</tr>
<tr>
<td>Total Membrane Area (m²)</td>
<td>250</td>
<td>350</td>
<td>450</td>
<td>750</td>
<td>950</td>
<td>1200</td>
</tr>
</tbody>
</table>

## LARGE CAPACITY

<table>
<thead>
<tr>
<th>Model</th>
<th>i-UF 27</th>
<th>i-UF 32</th>
<th>i-UF 38</th>
<th>i-UF 44</th>
<th>i-UF 52</th>
<th>i-UF 60</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production (m³/h)¹</td>
<td>54-148</td>
<td>64-176</td>
<td>76-209</td>
<td>88-242</td>
<td>104-286</td>
<td>120-330</td>
</tr>
<tr>
<td>No. of UF modules</td>
<td>27</td>
<td>32</td>
<td>38</td>
<td>44</td>
<td>52</td>
<td>60</td>
</tr>
<tr>
<td>Total Membrane Area (m²)</td>
<td>1350</td>
<td>1600</td>
<td>1900</td>
<td>2200</td>
<td>2600</td>
<td>3000</td>
</tr>
</tbody>
</table>

¹ The production range is based in a flux range of 40 – 110 LMH using DOW's Ultrafiltration Modules with XP fibers.

Example of a 90,000 m³/d i-UF System for SWRO pretreatment.
Self-cleaning and UF in 22 m x 11 m footprint.
DOW Ultrafiltration Modules

Features

DOW Ultrafiltration (UF) modules with XP fiber are made from high permeability, high mechanical strength, hollow fiber PVDF membranes. The modules provide excellent performance, industry leading membrane area with low energy and chemical consumption. DOW Ultrafiltration modules have the following general properties and characteristics:

- Up to 35% higher permeability than previous generation modules helping to improve operating efficiencies and productivity.
- 0.03 µm nominal pore diameter for removal of bacteria, viruses, and particulates including colloids to protect downstream processes such as RO.

- PVDF polymeric hollow fibers for high mechanical strength with excellent chemical resistance providing long membrane life and reliable operation.
- Outside-In flow configuration allowing a wide range of solids in the feed water minimizing the need for pretreatment processes and reducing the backwash volume compared to Inside-Out configurations.

DOW Ultrafiltration Modules can be used for a wide variety of treatment applications such as industrial and municipal wastewaters, surface water, and seawater.

Operating Limits

<table>
<thead>
<tr>
<th></th>
<th>SI Units</th>
<th>US Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Filtrate Flux (25°C)</td>
<td>40 – 110 l/m²hr</td>
<td>24 – 65 gfd</td>
</tr>
<tr>
<td>Flow Range Per Module</td>
<td>2.0 – 8.5 m³/hr</td>
<td>8.8 – 37.4 gpm</td>
</tr>
<tr>
<td>Temperature</td>
<td>1 – 40°C</td>
<td>34 – 104°F</td>
</tr>
<tr>
<td>Maximum Inlet Module Pressure (20°C)</td>
<td>6.25 bar</td>
<td>90.65 psi</td>
</tr>
<tr>
<td>Maximum Inlet Module Pressure (40°C)</td>
<td>4.75 bar</td>
<td>68.89 psi</td>
</tr>
<tr>
<td>Maximum Operating TMP</td>
<td>2.1 bar</td>
<td>30.5 psi</td>
</tr>
<tr>
<td>Maximum Operating Air Scour Flow</td>
<td>12 Nm³/hr</td>
<td>7.1 scfm</td>
</tr>
<tr>
<td>Maximum Backwash Pressure</td>
<td>2.5 bar</td>
<td>36 psi</td>
</tr>
<tr>
<td>Operating pH</td>
<td>2 – 11</td>
<td>2,000 mg/L</td>
</tr>
<tr>
<td>Maximum NaOCl</td>
<td>2,000 mg/L</td>
<td>300 µm</td>
</tr>
<tr>
<td>Maximum Particle Size</td>
<td>≤ 0.1 NTU</td>
<td>≤ 2.5</td>
</tr>
<tr>
<td>Flow Configuration</td>
<td>Outside in, dead end flow</td>
<td></td>
</tr>
<tr>
<td>Expected Filtrate Turbidity</td>
<td>≤ 0.1 NTU</td>
<td></td>
</tr>
<tr>
<td>Expected Filtrate SDI</td>
<td>≤ 2.5</td>
<td></td>
</tr>
</tbody>
</table>
Technical Specifications

- Outside to Inside (FOTI) Design.
- The UF is BWed or CEBed as in Conventional Systems (Can include air scouring).
- Filtration Stages can be BWed at the same time or individually.
- UF Membrane package replacement similar to cartridge filters.

Typical Applications

The i-UF system is applicable to any type of application where conventional UF trains are used. Some examples are:

- Large and medium size desalination plants.
- Municipal brackish water plants.
- Wastewater reuse plants.
- Industrial water plants.
- Off Shore platforms.
- Retrofit of conventional filtration (ie. MMF).

Natural Evolution of UF Systems

- Outside to Inside (FOTI) Design.
- The UF is BWed or CEBed as in Conventional Systems (Can include air scouring).
- Filtration Stages can be BWed at the same time or individually.
- UF Membrane package replacement similar to cartridge filters.

50 m² High Permeability XP Fibers

Patented
Other products in this range:

- c-UF (Continuous Ultrafiltration Systems)
- Ultrafiltration Standard Systems
- FTAUR series filters (Automatic Backwash Filters)
- ...