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**Pressured Type Module Specifications**

<table>
<thead>
<tr>
<th>Series</th>
<th>HFU Series</th>
<th>HFS Series</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Module Type</strong></td>
<td>HFU-2020</td>
<td>HFU-1020</td>
</tr>
<tr>
<td><strong>Membrane Surface Area</strong></td>
<td>72 m²</td>
<td>72 m²</td>
</tr>
<tr>
<td><strong>Design Flux (m³/hour)</strong></td>
<td>8.0 - 2.6</td>
<td>3.2 - 1.1</td>
</tr>
<tr>
<td><strong>Dimensions</strong></td>
<td>Diameter 216 mm</td>
<td>Diameter 216 mm</td>
</tr>
<tr>
<td></td>
<td>Length 2,160 mm</td>
<td>Length 1,120 mm</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>Full of water 110 kg</td>
<td>Full of water 60 kg</td>
</tr>
<tr>
<td></td>
<td>After draining 67 kg</td>
<td>After draining 40 kg</td>
</tr>
<tr>
<td><strong>Material</strong></td>
<td>Membrane PVDF (Polyvinylidene fluoride)</td>
<td>Casing Polyvinylchloride</td>
</tr>
<tr>
<td><strong>Max. Wall Pressure</strong></td>
<td>300 kPa (44 psi)</td>
<td></td>
</tr>
<tr>
<td><strong>Operating Temperature</strong></td>
<td>0 – 40 degree C</td>
<td></td>
</tr>
<tr>
<td><strong>pH Range</strong></td>
<td>1 – 10 at Filtration, 0 – 12 at Chemical Cleaning</td>
<td></td>
</tr>
</tbody>
</table>

- Other modules with smaller membrane areas are also available upon request.
- Specifications subject to change without notice.

**Note:**
Product exports may need security control and government regulatory clearances. Exporters are required to obtain such clearances.

**TORAYFIL®**

PVDF Hollow Fiber UF Membrane

TORAYFIL is a registered trademark of Toray Industries, Inc.

**Global Website:** [http://www.toraywater.com/](http://www.toraywater.com/)

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**About Toray**

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Toray’s Innovative Separation Technology Offers Competitive Solutions.

Toray’s PVDF hollow fiber membrane module, a pressured type hollow fiber UF (ultra filtration) membrane module, effectively removes suspended solids and microorganisms such as pathogens, when used for various types of water treatment. This innovative membrane module was developed with polymer science and the membrane fabrication technologies accumulated in Toray Industries, Inc. for more than 30 years.

**Polysulfone (PS)**
**Polyacrylonitrile (PAN)**
**Polyethylene (PE)**
**Cellulose Acetate (CA)**

**Soaking Test Results in Chlorine**

<table>
<thead>
<tr>
<th>Soaking period (hr)</th>
<th>Strength after soaking / Initial strength (-)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>0.2</td>
<td>0.4</td>
</tr>
<tr>
<td>0.6</td>
<td>0.8</td>
</tr>
<tr>
<td>0.8</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>1.2</td>
</tr>
</tbody>
</table>

**PVDF Flow Direction**

**Outside-to-Inside Flow Direction**
The flow direction is outside-to-inside, which is suitable for high turbidity water treatment, because an air-scrubbing method can be adopted to remove suspended solids effectively.

**High Chemical Resistance with Polyvinylidene Fluoride (PVDF)**
PVDF is one of the best membrane materials that allows using chlorine and strong acid for chemical cleaning of the membrane, resulting in better cleaning effect and longer sustainable flux rates.

**High Mechanical Strength with High Filtration Flux**
Toray’s special spinning method with PVDF enables high mechanical strength without reinforcement and high filtration flux at the same time. Additionally, the spinning method achieves high-precision small pore size control with uniform diameter distribution, providing high fouling resistance.

**Advantages of Toray PVDF Hollow Fiber Membrane Modules**

**Safe Water Provided**
Toray membrane modules are made of reliable materials and manufactured under our rigorous quality control. Model HFS-2020 is certified for drinking water production.
- **ANSI/NSF 61**
- **AMST (Association of Membrane Separation Technology of Japan)**
- **CDPH (California Department of Public Health)**

**Examples of Actual Plants**
Toray’s membrane modules provide high-quality water on a daily basis for drinking, RO pretreatment, water reuse and other applications.

**Membrane Module Type**

<table>
<thead>
<tr>
<th>Membrane Module Type</th>
<th>HFU series</th>
<th>HFS series</th>
</tr>
</thead>
<tbody>
<tr>
<td>MNCO or Nominal Pore Size</td>
<td>150,000 Da (UF)</td>
<td>0.02 micrometer (UF)</td>
</tr>
</tbody>
</table>

**Purified Water Flux [m³/h at 100 kPa]**

<table>
<thead>
<tr>
<th>Purified Water Flux</th>
<th>Drinking Water Production</th>
<th>Industrial Water Treatment</th>
<th>Seawater Desalination (for RO pretreatment)</th>
<th>Wastewater Tertiary Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.8</td>
<td><img src="https://example.com/recommended.png" alt="Recommended" /></td>
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<td>1.8</td>
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<td><img src="https://example.com/recommended.png" alt="Recommended" /></td>
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