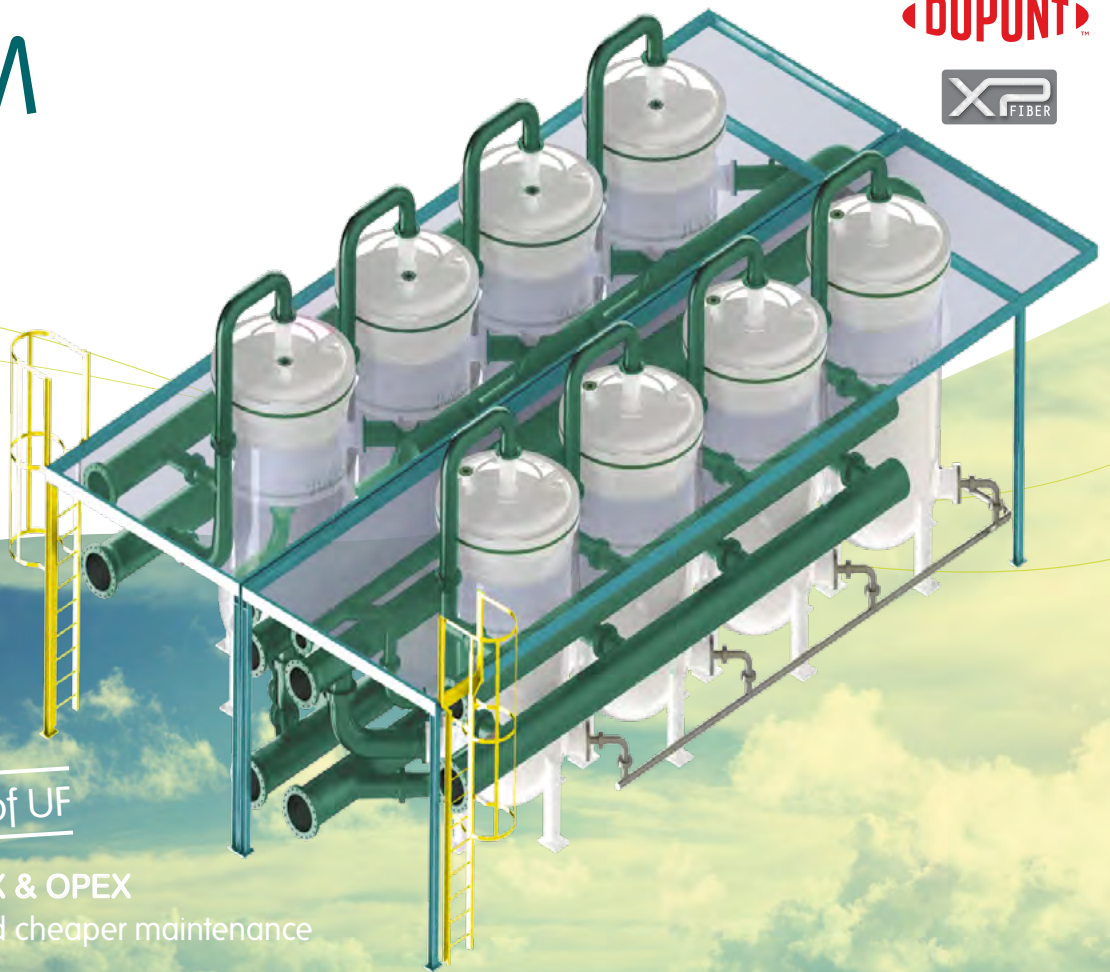


# INTEGRATED ULTRAFILTRATION SYSTEM



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**

Material's  
availability:  
\_ FRP/GRP  
\_ SS  
\_ CSRL

fluytec



# 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.

The vessel internals and membrane cartridge design allow changing membrane material, configuration or size at any time. Other materials upon request (Stainless Steel & Carbon Steel Rubber Lined).

This enables the EPC/End User to take advantage of the following main benefits:

## EPC's

Decreases significantly



PROJECT'S CAPEX



PROJECT'S LEAD TIME



PLANT'S FOOTPRINT

## END USERS

Decreases significantly



MEMBRANE REPLACEMENT COSTS



SOLID WASTE DURING REPLACEMENT



WATER CONSUMPTION



POWER CONSUMPTION



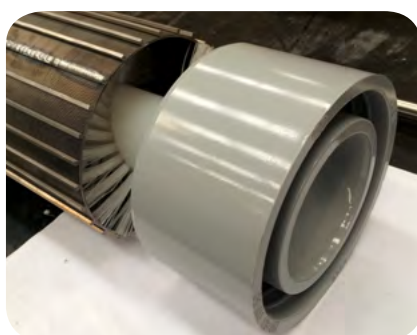
# Technology Description

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

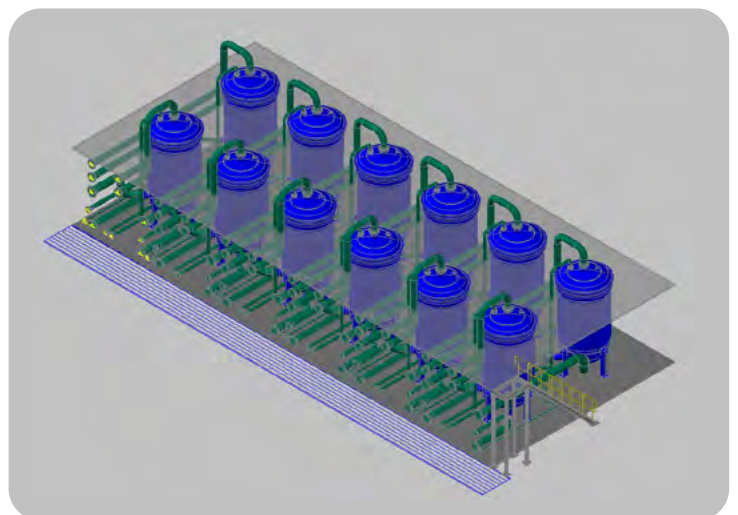
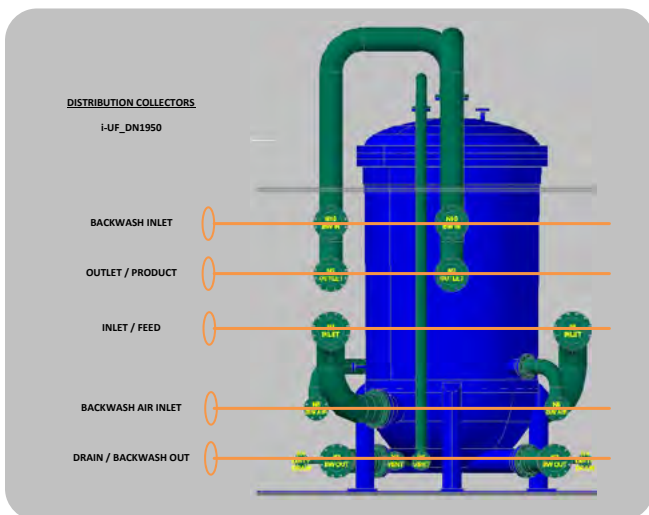
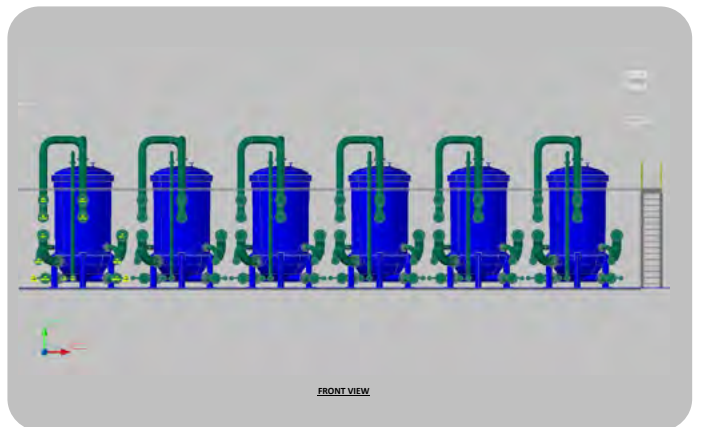
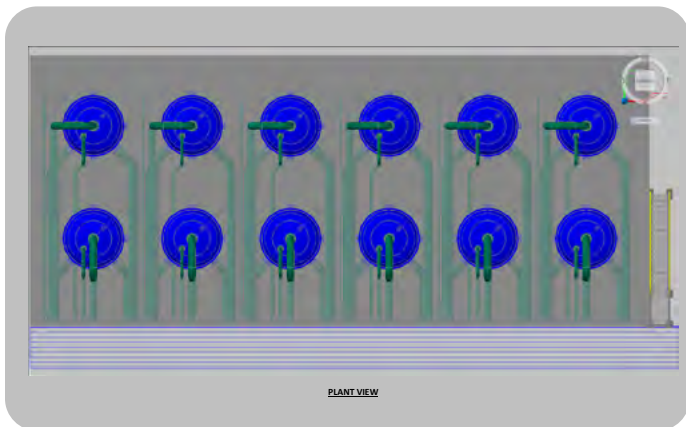
Model	i-UF 5	i-UF 8	i-UF 10	i-UF 14	i-UF 19	i-UF 21	i-UF 28
Production (m <sup>3</sup> /h) <sup>1</sup>	10-28	16-45	20-57	29-80	39-108	43-120	58-160
Total Membrane Area (m <sup>2</sup> )	260	416	520	728	988	1,092	1,456

## LARGE CAPACITY

Model	i-UF 34	i-UF 40	i-UF 46	i-UF 55	i-UF 61	i-UF 65	i-UF 70
Production (m <sup>3</sup> /h) <sup>1</sup>	70-194	83-228	95-263	114-314	126-348	135-371	145-400
Total Membrane Area (m <sup>2</sup> )	1,768	2,080	2,392	2,860	3,172	3,380	3,640

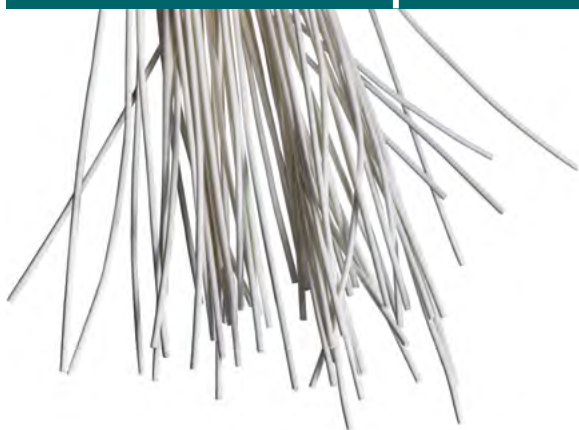
<sup>1</sup> The production range is based in a flux range of 40 - 110 LMH using DuPont's Ultrafiltration Modules with XP High Permeability Fibers.

Example of a 100,000 m<sup>3</sup>/d i-UF System for SWRO pretreatment. Self-cleaning and UF in 22 m x 11 m footprint.



# DuPont Ultrafiltration Modules

**DUPONT** Made with  
DuPont Technology



## Features

DuPont 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. DuPont 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  $\mu\text{m}$  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.

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



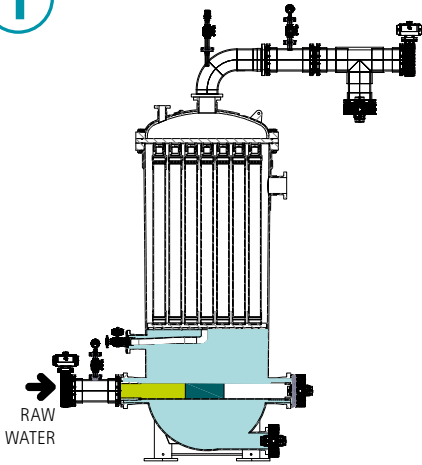
Source: Courtesy of DuPont Water Solutions.

## Operating Limits

	SI Units	US Units
Filtrate Flux (25°C)	40 – 110 l/m <sup>2</sup> hr	24 – 65 gfd
Flow Range Per Module	2.0 – 8.5 m <sup>3</sup> /hr	8.8 – 37.4 gpm
Temperature	1 – 40°C	34 – 104°F
Maximum Inlet Module Pressure (20°C)	<b>6.25 bar</b>	<b>90.65 psi</b>
Maximum Inlet Module Pressure (40°C)	4.75 bar	68.89 psi
Maximum Operating TMP	<b>2.1 bar</b>	<b>30.5 psi</b>
Maximum Operating Air Scour Flow	12 Nm <sup>3</sup> /hr	7.1 scfm
Maximum Backwash Pressure	<b>2.5 bar</b>	<b>36 psi</b>
Operating pH		2 – 11
Maximum NaOCl		<b>2,000 mg/L</b>
Maximum Particle Size		300 $\mu\text{m}$
Flow Configuration		<b>Outside in, dead end flow</b>
Expected Filtrate Turbidity		$\leq$ 0.1 NTU
Expected Filtrate SDI		$\leq$ 2.5

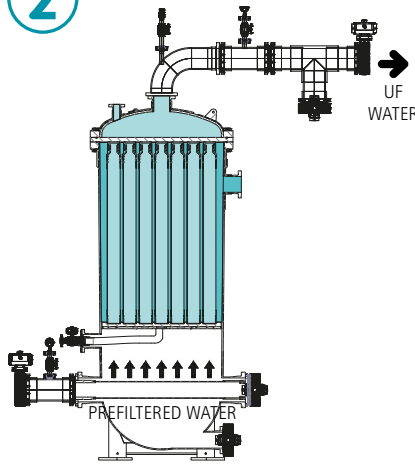
# How does i-UF technology work?

## 1 Integrated Coarse Filtration >>



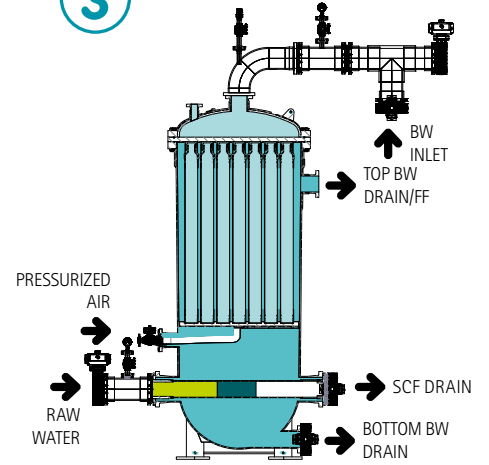
- Bottom chamber receives the raw feed water and the first filtration stage takes place here.
- Integrated Self-Cleaning Pre-filter (150-300 micron).

## 2 Out-in XP Ultrafiltration >>



- Out-in filtration.
- Filtrate is collected in the top chamber.
- UF modules can be Backwashed or Chemically Enhanced Backwashed as in conventional systems.

## 3 Backwash Process >>



- Both systems are backwashable at the same time or separately.
- Strainer is cleaned by internal brushes driven by a propeller.
- Backwash process steps include: UF fibers air scouring, Drain, UF fibers backwash bottom, UF fibers backwash top, Self-Cleaning Pre-filters Backwash and a Forward Flush.

## Technical Specifications

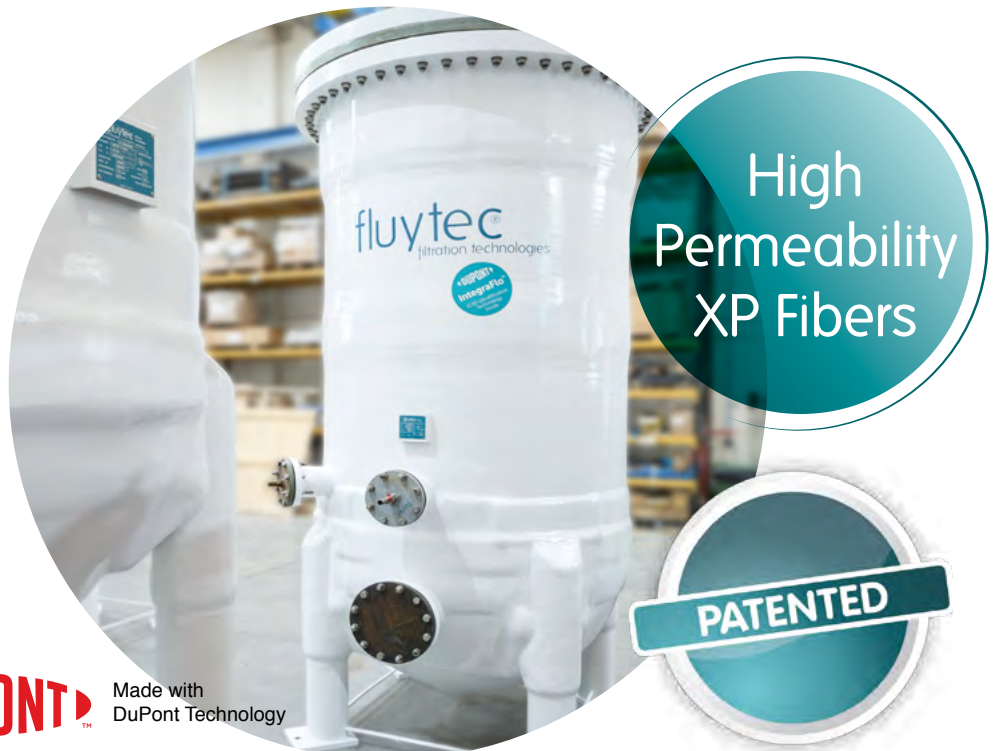
- Outside to Inside (FOTI) Design.
- The UF is BWed or CEBed as in Conventional Systems (Can include air scouring).
- Filtration Stages can be BWed at the same time or individually.
- UF Membrane package replacement similar to cartridge filters.

## NATURAL EVOLUTION OF UF SYSTEMS

## 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).



**DUPONT** Made with DuPont Technology



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- ...



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