

UltraFlex™ Ultrafiltration Systems



Graver's UltraFlex UF systems are designed to remove suspended solids (typically retain solids and molecules larger than $0.02\mu\text{m}$) and organic impurities from in a variety of industrial water applications such as pretreatment, makeup water and wastewater/effluent treatment applications. As an alternative to conventional filtration, these UF systems protect downstream equipment from fouling, lowering service and operating costs.

Advantages

- Consistent product quality regardless of feed water
- Protection of downstream equipment from particulate fouling
- Physical membrane barrier resulting in SDI typically <1 ntu
- Compact footprint when compared to conventional filtration
- Membrane selection optimized for the application

Standard Design Features

- Programmed electronic microprocessor
- Permeate TDS meter
- Digital display flow meters
- Corrosion-resistant cartridge prefilter housing
- Stainless steel vertical centrifugal pump
- Liquid-filled, stainless steel pressure gauges
- High pressure piping: PVC sch. #80
- Low pressure piping: PVC sch.#80
- Membrane vessels: PVC
- UF Modules selected based upon performance
- High pressure switch
- NEMA-4 electric enclosure
- Low pressure safety switch
- Automatic inlet shut-off valve
- 460V/60HZ/3PH, TEFC motor
- Frame: Welded steel, powder coated
- High pressure valves: 316 stainless steel
- Emergency stop
- Sample valves
- Cleaning ports

Additional Design Features

- VFD feedwater pumps
- Backwash/chemical injection pumps
- Backwash strainers
- Mag flowmeters
- Pressure transmitters
- Turbidimeters (feed and product)
- Chemical feed systems



Typical Applications:

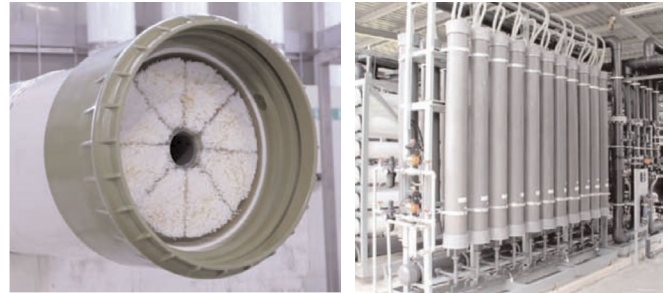
- **Boiler Water Make-Up**
- **Cooling Tower Make-Up**
- **Cooling Tower Blow Down**
- **Cooling Tower Side Stream**
- **Wastewater Treatment**

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Specifications

A variety of configurations and materials are available, allowing the most technically appropriate and economical system to be created for each project. UF systems are designed as modular units, which can be expanded with additional membrane modules to suit individual requirements. Hollow fiber single bore or multibore UF membranes are selected based upon the application and optimal performance.



Design Parameters

Inlet Pressure	5 psig (0.34 barg)
Inlet Temperature	68°F (20°C)
System Recovery	85-95% (typical)
Product Pressure	10 psig (0.69 barg)

Feedwater Guidelines and Limitations

Feed Water Turbidity (NTU)	0-50 NTU Average, 100 NTU Peak (0.9 mm fiber) 50-160 NTU Average, 250 NTU Peak (1.5 mm fiber)
TOC (2)	< 20 mg/L
pH	3-10
Oil and Grease	< 3 mg/L
Hydrogen Sulfide	< 0.2 mg/L
Fe/Mn	5 mg/L /1 mg/L (must be in suspended solids form)
Cationic Polymers	Non Detectable

Parameters Not to Exceed*

Inlet Temperature	36-104° (2-40°C) Avoid abrupt changes in temperature (>1°C/minute)
pH (Operation)	3-10 (1-13 for cleaning)
Inlet Pressure	10 psig (0.69 bar)
Transmembrane Pressure	
Filtration	1.5-20 psi (0.1-1.5 bar)
Backwash	5-40 psi (0.3-3.0 bar)
Ambient Conditions	
Temperature	36-104° (2-40°C) Maximum
Humidity	Non-condensing conditions up to 90%
Exposure	Protect from sunlight and other UV sources

* Contact Graver Water if your conditions are outside the range of this table.

Contact Us

Graver Water Systems, LLC
675 Central Avenue | Suite 3
New Providence, NJ 07974

T: 908 516 1400
F: 908 516 1401
E: info@graver.com