

# Model 4588

Ultra Filtration (UF) Brackish and Seawater Pilot System



Used as an optimization and test system, Sigma Design Company's **Model 4588 Pilot Ultrafiltration (UF) System for Brackish and Seawater** is a fully operational, engineered membrane system used to determine the effectiveness and sizing of full scale UF equipment projects

Sigma's **PVDF hollow fiber UF membrane modules** feature a 0.02  $\mu\text{m}$  nominal pore diameter for optimal removal of particulates, bacteria, and

viruses and provide high mechanical strength and chemical resistance.

When compared to granular filter media, they produce superior water quality and are virtually unaffected by variable raw water quality—all at a cost similar to conventional filtration technology. These membranes are an effective tool in:

**Particle and Microorganism Removal:** Ultrafiltration is very effective at removing particulate matter, bacteria, viruses, and other pathogens from water due to its fine pore size. This makes UF an excellent choice for producing potable water from brackish sources.

**Pre-treatment for Desalination:** In the case of seawater, UF is often used as a pre-treatment step before desalination processes like reverse osmosis (RO). UF helps in reducing the fouling of RO membranes by removing fine particulates and microorganisms, thereby improving their efficiency and extending the lifespan of the RO systems.

**Reduction of Silt Density Index (SDI):** UF is particularly effective in reducing the SDI of water, which is a measure of the fouling potential of water on RO membranes. Lower SDI values indicate cleaner water, which is crucial for preventing clogging and degradation of RO membranes.

## SYSTEM SPECIFICATIONS

Design specifications:

- 20 GPM design flow
- MAWP = 50 PSI
- MAWT = 104° F
- Power requirement: 230 VAC, Ø1, 30A
- On-board air supply: 4.1 SCFM @ 90 PSI
- Manual controls
- Valve actuation, pump start/stop, air scour, etc.
- 2 HP, mag drive pump, plastic housing, 55 PSI @ 20 GPM

## SCH.80 PVC plumbing

- Polypropylene back pulse tank:
- 304 SS frame

Operational running modes include:

- Piping flush cycle
- Module flush cycle
- Production to discharge cycle
- Production to back pulse tank cycle
- Back pulse flush cycle
- Back pulse flush w/ scour aeration cycle
- Scour aeration cycle
- Drain cycle

## TURNING SMART IDEAS INTO PRODUCT SOLUTIONS

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**PVDF (polyvinylidene fluoride) ultrafiltration membranes** are quite suitable for use in seawater applications due to several inherent properties that make them advantageous in harsh environments, including:

**Chemical Resistance:** PVDF membranes are highly resistant to chemicals, including chlorine and other oxidants. This is particularly important in seawater applications, where membranes may need to withstand aggressive cleaning agents and varying pH levels to remove biofouling and scaling.

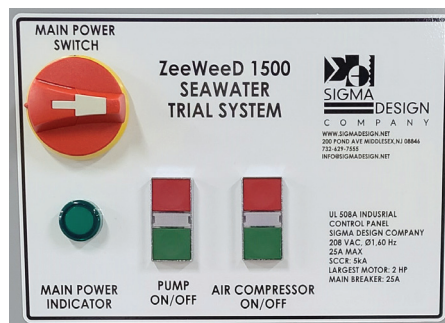
**Mechanical Strength:** PVDF membranes are known for their excellent mechanical strength and durability. They can withstand higher pressures and harsh operating conditions, which are common in the treatment of seawater.

**Thermal Stability:** These membranes exhibit good thermal stability, which allows them to operate effectively at higher temperatures without degrading. This can be advantageous in regions where seawater temperatures are naturally higher.

**Fouling Resistance:** PVDF membranes typically have better fouling resistance compared to other polymeric materials. This property is crucial in seawater applications, where the high organic and microbial load can lead to significant membrane fouling.

**Compatibility with Pre-treatment and Post-treatment Processes:** PVDF UF membranes can effectively act as a pre-treatment step for desalination processes such as RO. In addition, by reducing the particulate and microbial load on the RO membranes, they help in extending the lifespan and efficiency of these more sensitive systems.

[Learn more about our Industrial Water and Filtration Systems](#)



## About Sigma Design Company

Sigma Design is a leading one-stop design, engineering, and manufacturing resource for the development of specialty equipment and engineered systems. Our mission is to provide clients with creative, affordable and easily manufactured designs and manufacturing assembly solutions that achieve their product, business and revenue goals. Our clients have included hundreds of leading global brands and manufacturing firms across a wide array of industries. Based in New Jersey for more than 20 years, we have transformed more than 1,000 design and design/build projects into successful products and specialty equipment in use across the world.

### SERVICES INCLUDE:

- Design and engineering
- Testing
- Manufacturing

Your trusted one-stop resource for end-to-end product development and commercialization solutions, on time and on budget.

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