# AVMD™

## Advanced Vacuum Membrane Distillation

**As a globally-recognized leader in zero liquid discharge (ZLD) with more than 160 installations, Aquatech has consistently innovated thermal and membrane technologies. Our newest solution, Advanced Vacuum Membrane Distillation (AVMD), combines both expertises to produce a thermal evaporation process optimized for direct treatment of RO reject or similar brine streams with some preconditioning. Furthermore, AVMD is able to effectively reduce brine volume & recover high quality distillate to meet either ZLD or Minimal Liquid Discharge (MLD) requirements.**

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## Sustainable. Modular. Efficient.

Increasing regulations and pressure for industries around the world to achieve ZLD & MLD highlight a growing need for innovation in brine management technologies. Currently, conventional thermal evaporation technologies struggle to provide low-cost solutions for customers due to high installation and maintenance costs. Through years of research, Aquatech's Advanced Vacuum Membrane Distillation (AVMD) process has successfully been developed to solve these issues and effectively create a solution for small-scale thermal evaporation needs.

AVMD uses modular configuration and proprietary membrane design to substantially drive down cost of ownership for small ZLD & MLD facilities. AVMD is particularly effective in applications where a significant CapEx advantage over conventional thermal evaporation technologies can be applied, or where there is a recoverable product such as a solvent or valuable material which can be recycled back to an upstream industrial production process.

### Typical Applications

- Chemicals
- Food & Beverage
- Pharmaceutical
- Microelectronics
- Data Centers
- Manufacturing
- Automotive
- Landfill Leachate

## Package Features

• High brine concentration and salt rejection abilities, allowing for >90% Recovery and low distillate TDS.

• Lower CapEx than conventional thermal evaporation systems in low capacity applications due to its modular configuration.

• Innovative design separates the membrane from the liquid/brine solution, eliminating membrane fouling and leading to a consistently high flux and distillate quality

• By minimizing the installation, commissioning, and operational costs, our AVMD system provides a highly cost-competitive solution.

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## Operational Benefits

- Lower operating costs and footprint than conventional thermal evaporation technologies.
- Consistent distillate quality even when dealing with high brine concentrations.
- Can handle all non-volatile organics and recycle them in cases where solvent/valuable material recovery is desired.
- Design prevents membrane fouling at salt saturation, in contrast to conventional MD.
- Consistently high flux due to innovative design, more than double that of conventional MD.
- Superior effluent quality with 35% total solids, for further brine volume reduction or recovery.
- Membrane is highly temperature-resistant, capable of handling up to 90°C feed water. Additionally, its durability allows for maximized operating life.

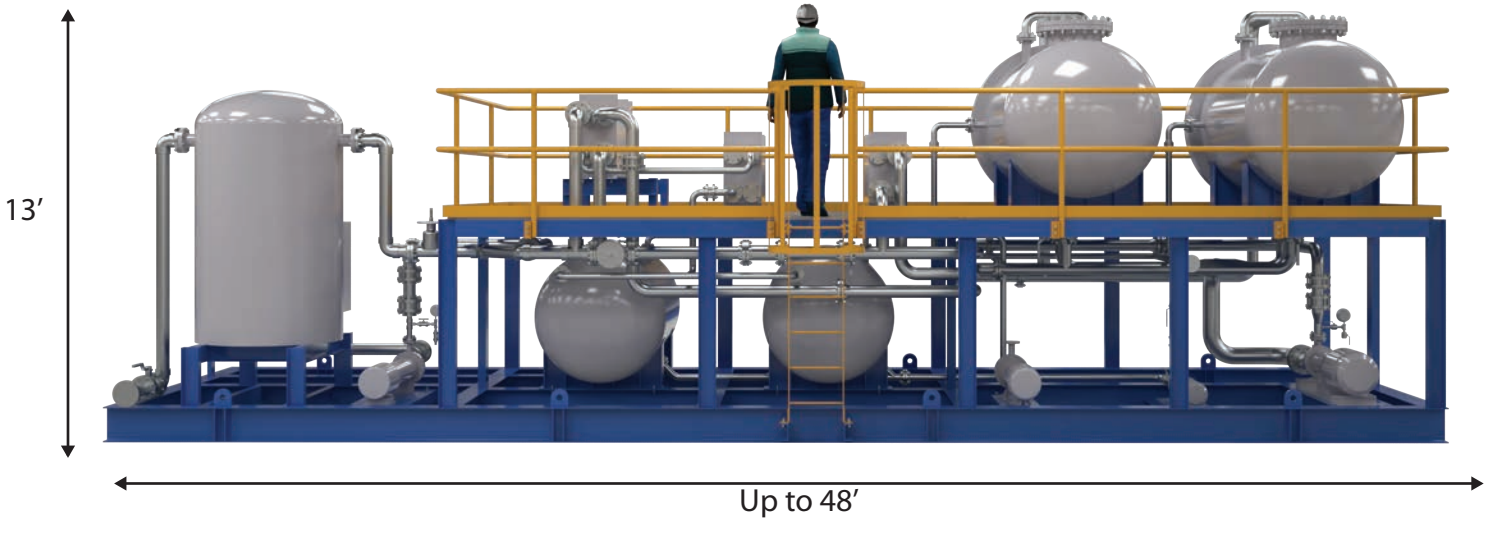
## AVMD™ Configurations

| Parameter | Unit | 12 $m^3$/day | 24 $m^3$/day | 36 $m^3$/day | 48 $m^3$/day |
|---|---|---|---|---|---|
| **Length** | Feet | 34 | 38 | 41 | 48 |
| **Width** | Feet | 11.5 | 11.5 | 11.5 | 11.5 |
| **Height** | Feet | 13 | 13 | 13 | 13 |
| **Brine Tanks** | # | 1 | 2 | 3 | 4 |
| **Total Connected Load** | kW | 10 | 16 | 20 | 24 |

## Inlet / Outlet Water Quality

| Parameter | Unit | Value |
|---|---|---|
| **Feed Brine Conc.** | % Salinity | 10 - 12 (RO Reject)* |
| **Salt Rejection** | % | 99.5 - 99.9 |
| **Operating Flux** | LMH | 15 - 20 |
| **Feed Temperature** | °C | 70 - 90 |

* If not coming from RO reject stream, will need preconditioning



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## Product Advantages

- Consistent product quality regardless of feed brine concentration, with recovery >90%.
- High flux and elimination of membrane fouling through innovative design.
- Compact footprint with limited infrastructure construction or modification required.
- Enhanced automation and remote monitoring for ease of operation and optimal efficiency.
- Fast delivery and installation.
- User-friendly operation and support.
- Ability to be integrated with direct solar energy or waste heat from plant.
- Extensive experience with membrane filtration technology.