



**evoqua**  
WATER TECHNOLOGIES



## **ADI<sup>®</sup> ANAEROBIC MEMBRANE BIOREACTOR (AnMBR)**

**SUPERIOR TREATMENT SOLUTION FOR HIGH-STRENGTH WASTEWATER**

## THE TECHNOLOGY

The ADI® anaerobic membrane bioreactor (AnMBR) is the latest innovation in biological wastewater treatment. The state-of-the-art ADI® AnMBR system combines anaerobic digestion with physical separation membranes, resulting in maximum organic load removal and biogas production. This high-rate technology produces a superior effluent quality compared to other anaerobic technologies on the market. For example, biochemical oxygen demand (BOD) removal is typically >99.5% and total suspended solids (TSS) removal is 100%.

Years of proven full-scale applications have demonstrated that the AnMBR is ideally suited for treating wastewater streams or slurries with very high concentrations of organics TSS and fat, oil, and grease (FOG). It can also treat solid and semi-solid wastes and slurries. Existing anaerobic

systems can easily be upgraded to an AnMBR to increase loading capacity and improve performance and effluent quality.





### **STATE-OF-THE-ART SYSTEM**

The ADI® AnMBR combines anaerobic digestion with physical separation membranes, resulting in maximum organic load removal, biogas production, and exceptional effluent quality.

## THE PROCESS

### COMPLETE SOLIDS RETENTION

A membrane barrier within the tank performs the gas-liquid-solids separation and reactor biomass retention functions. This near-absolute barrier ensures complete solids retention, efficient system operation, and process stability—even under high organic loading and intense mixing scenarios. The barrier greatly reduces the requirements for downstream treatment of the anaerobic effluent. The ADI® AnMBR can be paired with an ADI membrane bioreactor (MBR) to provide complete treatment and meet even the strictest discharge requirements.

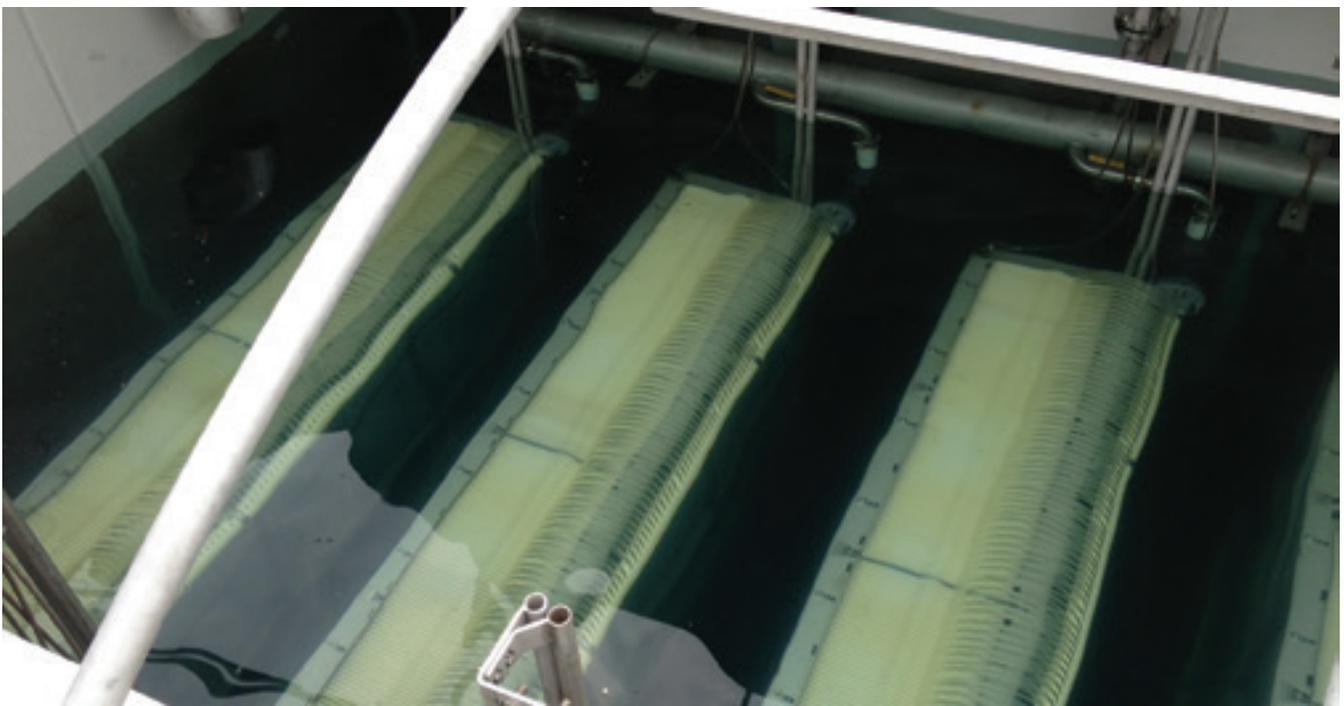
### NO GRAVITY SETTLING

Since gravity settling is not required, the AnMBR can employ higher organic loadings and mixing intensities than with other anaerobic technologies. This increases organic removal rates, improves biogas production, and reduces the system footprint so that wastewater treatment can occur in a small space.

### RENEWABLE ENERGY FROM BIOGAS

The AnMBR produces the highest-possible-quality anaerobic effluent—and it also produces methane-rich biogas. The AnMBR retractable tank cover collects this valuable resource, which can be treated and used as a renewable energy source. Generating energy from waste provides many attractive financial and environmental benefits.

Biogas can act an alternative to conventional energy sources such as fossil fuels. Various technologies are available for scrubbing the biogas for use in boilers, electrical generators, and turbines. Cogeneration of electricity is also possible. The biogas can also be treated to pipeline quality and compressed for injection into a nearby natural gas pipeline.





## KEY INDUSTRIAL MARKETS

- Food & beverage
- Organic food waste
- Brewery
- Distillery
- Chemical
- Fuel and food-grade ethanol production (stillage, syrup, and spent grains)



## EXCELLENT WASTEWATER TREATMENT PERFORMANCE

The ADI® AnMBR system provides many benefits for industrial processors worldwide.

### COST SAVINGS

- Minimize sludge handling and disposal costs
- Save on energy costs:
  - Significantly less energy-intensive than aerobic systems
  - Biogas can be utilized to reduce fossil fuel consumption
  - Minimize aerobic polishing requirements
- Eliminate primary treatment and wastewater surcharges
- Reduce or eliminate chemical usage

### PROCESS ADVANTAGES

- Membrane barrier ensures complete solids retention and process stability
- Large biomass inventory ensures efficient treatment at all times
- Minimal pretreatment and post-treatment (aerobic polishing) requirements
- Eliminates issues with gravity clarification
- Handles high organic loadings and mixing intensities
- Can digest high amounts of chemical oxygen demand (COD), TSS, and FOG

### ENVIRONMENTAL BENEFITS

- Consistent, high-quality effluent
  - Very low effluent BOD concentrations
  - Free of TSS
- Continuously meet discharge requirements
- Small footprint
- Convert organic waste to recoverable green energy (heat and power)
- Waste sludge suitable for land application
- Improve local and global water security

### OPERATION & MAINTENANCE

- Avoid common issues while operating at thermophilic temperatures
- Minimal operator attention
- Reduced sludge handling
  - Granular sludge not required
  - Can digest waste activated sludge from downstream aerobic process
- Reduced or eliminated pretreatment requirements
- Superior membrane durability and performance with low maintenance:
  - Long lifetime
  - Simple, infrequent cleaning procedure
  - Membranes are cleaned in place

## PROJECT DELIVERY

ADI Systems customizes each ADI® AnMBR system to meet the unique needs of the application. Design/build project delivery offers a number of benefits, including a single point of contact and responsibility, and consistency in design and construction quality throughout the entire project. Technology-only packages are also available. ADI Systems also offers aftercare service with advice by our experienced anaerobic treatment specialists.





## ADI® SYSTEMS

### WASTEWATER TREATMENT AND WASTE-TO-ENERGY SOLUTIONS

ADI® Systems, an Evoqua brand, is a world-leading wastewater treatment and waste-to-energy technology solution provider with over 35 years of experience treating industrial processing wastewater and organic waste. We understand the complex challenges and strive to engineer unique solutions for the industry. Sustainability is the foundation of our design and construction processes, and innovative clean tech research and development is the building block of our many successful projects around the world.

**ADI® Systems**  
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