UlmoWater

Modular and Scalable

Package solution

Compact

Aegis MBR

Package Wastewater Treatment Solution

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Aegis MBR

Package Wastewater Treatment Solution

About Us

The Aegis MBR (Membrane Bioreactor) module is a rapidly deployable, modular, and scalable wastewater treatment package plant developed by Ulmo Water.

Our team includes multi-disciplinary, professionally registered engineers with combined experience of more than 20 years in designing and constructing wastewater treatment infrastructure.

The Aegis reactor uses modern aeration and membrane technology to deliver high quality effluent, packaged in a robust reactor that can withstand the harsh conditions of the African continent.

Mixers

Mixing to ensure that wastewater and nutrients are uniformly mixed, and to prevent the settling of biomass and solids, thereby promoting biomass growth for nutrient removal.

Armour Coated

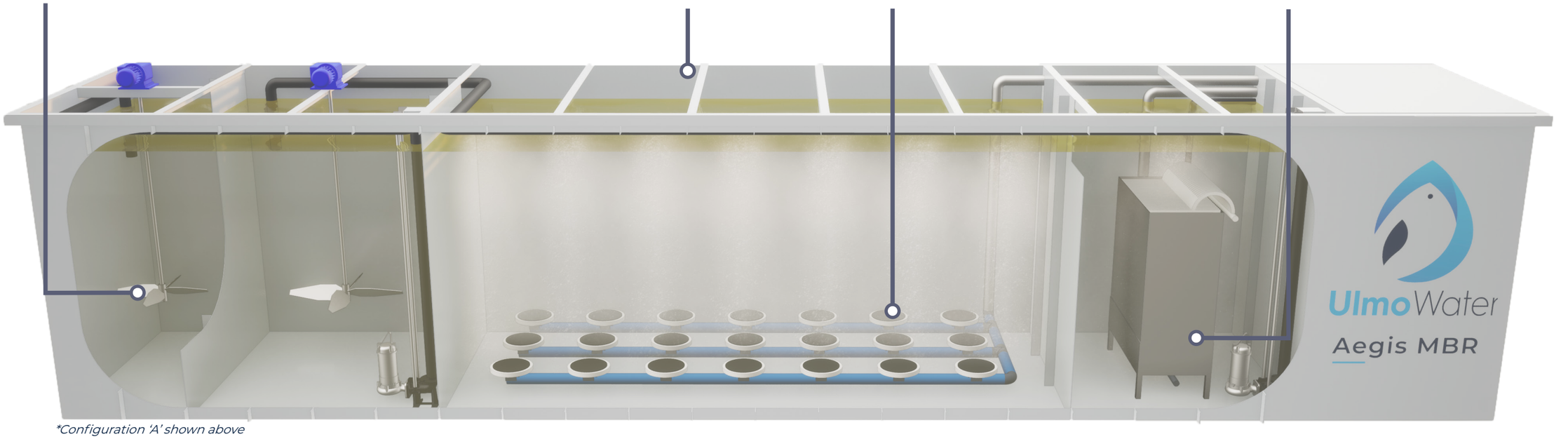
The mild steel tank is equipped with a robust epoxy mastic coating that provides exceptional resistance to harsh chemicals and is specially designed for industrial and maritime environments.

Fine Bubble Diffusers

Fine bubble diffusers release microbubbles of air into the wastewater to create a large surface area for oxygen transfer. The diffusers are made from fouling resistant materials, ensuring long lasting operation.

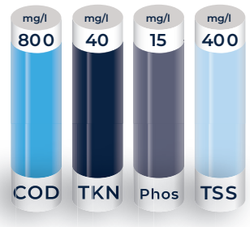
Membrane Technology

The Aegis reactor uses submerged semi-permeable membrane technology to deliver superior treated water quality within a compact footprint.



**Configuration 'A' shown above*

Raw water quality



**Higher organic loading, or different compositions, can be designed for, based on the clients water quality and end treated water requirements.*

1. Anaerobic Zone

In the anaerobic reactor phosphate accumulating organisms assimilate the necessary pre-cursor chemicals (VFAs + PHA) to allow for removal of soluble phosphates downstream in the aerobic reactor.

2. Anoxic Zone

In the anoxic reactor nitrates recycled from the aerobic zone are converted into nitrogen gas allowing for the removal of nitrogen from the wastewater as an inert gas.

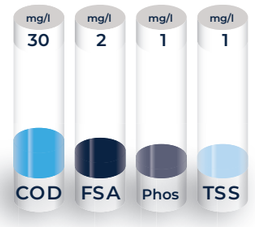
3. Aerobic Zone

Organics and phosphates are assimilated by microorganism (OHOs + PAOs) and effectively removed from the wastewater by removal of the sludge biomass from the reactor. Organic nitrogen and ammonia are converted to nitrates by bacteria (OHOs + ANOs) and then recycled back to the anoxic reactor for removal by denitrification.

4. Membrane Technology

The MBR reactor uses submerged semi-permeable membrane technology to physically separate suspended solids, pathogens, and other contaminants from the water, resulting in high-quality effluent.

Treated water quality



Water quality

The Aegis MBR reactor produces high-quality treated effluent by combining the benefits of membrane separation with biological nutrient removal.

The treated water from the Aegis reactor is free of pathogens and solids and can be used for a variety of applications, including reuse for irrigation and process water, pre-treatment for potable reuse or discharge to sensitive water bodies.

Industrial/Commercial Effluent

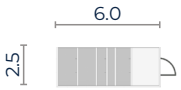
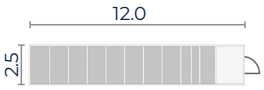
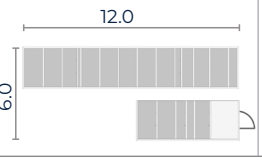
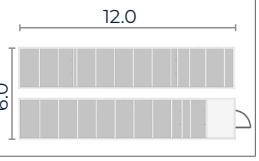
Screening and Equalization

Biological and physical treatment

Irrigation or further treatment

UlmoWater

Technical Specifications

Description	Aegis-20	Aegis-40	Aegis-60	Aegis-80
BOD Load* (kg/d)	12	34	53	72
Daily flow* (kl/d)	25	70	110	150
Population Equivalenty (PPE)	170	470	740	1000
Full Load Current 400V (A)	30	40	50	60
Daily Energy Usage* (kWh)	200	310	390	470
Specific energy usage (kWh/kl)	8.0	4.4	3.5	3.1
Indicative Cost** (ZAR)	1.2 - 1.4 m	1.9 - 2.1 m	2.5 - 2.7 m	3.1 - 3.3 m
Specific Cost (ZAR/kl/d)	52.0 k	28.5 k	23.5 k	21.3 k
Indicative Opex*** (ZAR)	6.0 k	6.5 k	12.6 k	13.0 k
Footprint L x W (m)				

** Based on Configuration A and a COD load of 800mg/l.*
***Ex works Cape Town. Indicative costs do not include the following items: lifting station, flow equalization, screening, sludge handling and dewatering, bulk power supply, bulk reticulation, backup power supply, treated water storage, and treated water boosting. (Cost applicable in 2023)*

Optional extra's: lifting station, screening, effluent condtitioning, polishing with sand/ AFM filtration, sludge handling & processing.

**** Includes chemical supply and equipment maintenance. Aegis 20 & 40 include site visit every two weeks, Aegis 60 & 80 include weekly site visits within 50km of CT.*

Design Parameters

Water Quality Summary	Raw	Treated
COD (mg/L)	800	30
BOD/COD fraction	>0.6	-
TKN (mg-N/L)	40	-
FSA (mg-N/L)	30	6
TP (mg/L)	15	1
TSS (mg/L)	400	1
Nitrate (mg-N/L)	0	1.5
pH	6 - 8	5.5 - 9.5
Faecal Coliform	-	<1
Min/Max Reactor T (°C)	15 / 30	

Available Configurations

A	Anaerobic	→	Anoxic	→	Aerobic	→ MBR
B	Anoxic	→	Aerobic	→	MBR	
C	Aerobic	→	MBR			

The water quality provided in these tables are based on medium strength domestic wastewater quality. Higher organic loading, or different compositions, can be designed for based on the clients water quality and end treated water requirements.

Frequently Asked Questions

Does the treatment plant generate foul odours?

No, a MBR process does not typically generate foul odours. The process is designed to efficiently treat wastewater while minimizing production of foul-smelling gases through proper aeration, mixing and management of the treatment process. Odours are limited to the screening and lift station and can be mitigated with design measures.

Does the treatment plant produce Waste Sludge?

Yes, all wastewater plants produce waste sludge as part of a healthy biological nutrient removal system. The sludge produced from the Aegis reactor is stabilized, therefore it will produce minimal odours. The sludge can be dewatered and disposed of as solid waste or a low-grade soil filler. We can supply various sludge handling options including drying beds, sludge presses and drying bag systems.

What are my options with the discharge of the treated water?

The treated water from the Aegis MBR reactor is compliant with the South African Department of Water Affairs special limits standards and can be discharged into various water bodies, reused for irrigation, reused as process water for cleaning operations or used as pre-treatment for reuse system.

How easy is it to transport and integrate the plant?

The package is engineered to fit into Hi-Cube 40ft shipping containers, ensuring ease of transportation and worldwide shipping capabilities. Factory built with all equipment installed and fully wet tested allowing for quick and easy integration.