Aspiral™

SMART PACKAGED WASTEWATER SOLUTIONS

Aspiral™ is a smart, containerized wastewater treatment solution based on the Membrane Aerated Biofilm Reactor (MABR) technology.

Fluence MABR is an innovative, well-validated technology for low-energy treatment of municipal wastewater. It uses a spirally wound, self-respiring membrane sleeve to provide aeration by diffusion for the wastewater treatment process. The spiral membrane module at the heart of the biological reactor performs simultaneous BOD, TN and TP removal, all in a single pass.

MABR passive aeration and single pass flow consumes significantly lower energy compared to the energy consumed by typical conventional treatment technologies.

Select the right configuration for the most suitable solution for small- to medium- sized treatment plants 20-2,000 m^3/day (5,300-530,000 GPD) serving villages, residential communities, resort hotels, commercial complexes and more. All Aspiral configurations can be remotely monitored and controlled.

The Aspiral system arrives fully equipped and checked for fast installation and start-up. It incorporates durable membrane materials with a life expectancy of over 20 years. The MABR biological treatment has no moving parts which leads to reduced maintenance. Aspiral meets the most stringent effluent regulations such as Class 1A (China) and Title 22 (US), and the effluent can be reused for agriculture and landscape irrigation with shorter implementation schedule and reduced regulatory procedure.

A standard Aspiral system will achieve the following removal rates at the clarifier effluent:

The Aspiral system can be cost-effectively designed for higher removal rates as required.

Typical energy consumption is 0.25 kWh/m^3 (0.001 kWh/gal) for flow rates of >500 m^3/d (132,000 GPD).

Contaminant	Removal %	Typical entry value	Typical effluent value
BOD_5	>96%	300 ppm	<10 ppm
COD	>88%	600 ppm	<70 ppm
NH_4N	>89%	45 ppm	<5 ppm
TN	>82%	55 ppm	<10 ppm
TP	>80%	8 ppm	<1 ppm
TSS	>94%	350 ppm	<20 ppm

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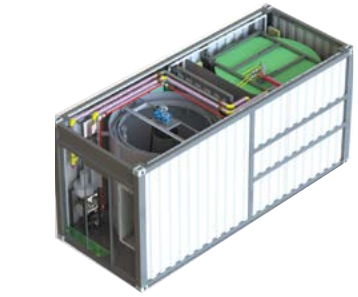
The Aspiral Family of Solutions

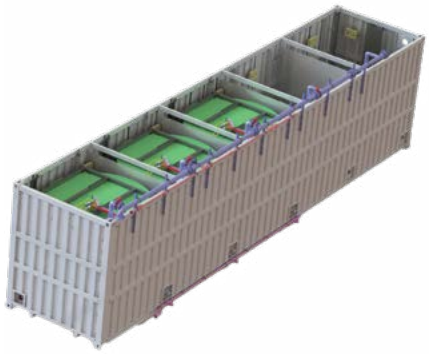


Aspiral S1

- Treats up to 50 m³/d of raw municipal wastewater
- Includes integral pre-treatment screen and clarifier

Aspiral M2

- Treats up to 115 m³/d of raw municipal wastewater
- Includes integral pre-treatment screen and clarifier



Aspiral L3

- Treats up to 300 m³/d of raw municipal wastewater
- 40% of volume is aerated by fine bubble diffusers for residual BOD removal
- External clarifier for cost-effective multiple-reactor installations

Aspiral Product Line

Configuration	Container size	# of MABR modules - Diameter	Capacity	People Equivalent	Integral Clarifier
Aspiral XS	15ft	1 - 160 cm Ø (63 in)	Up to 25 m³/d (6,000 GPD)	~150	√
Aspiral S1	20ft	1 - 220 cm Ø (86 in)	Up to 50 m³/d (13,000 GPD)	~300	√
Aspiral M1	30ft	1 - 220 cm Ø	Up to 75 m³/d (20,000 GPD)	~450	√
Aspiral M2	30ft	2 - 220 cm Ø	Up to 115 m³/d (30,000 GPD)	~700	√
Aspiral L2	40ft	2 - 220 cm Ø	Up to 185 m³/d (49,000 GPD)	~1100	
Aspiral L3	40ft	3 - 220 cm Ø	Up to 300 m³/d (79,000 GPD)	~1800	
Aspiral L4	40ft	4 - 220 cm Ø	Up to 350 m³/d (92,000 GPD)	~2100	
Aspiral L5	40ft	5 - 220 cm Ø	Up to 350 m³/d very low energy	~2100	

Unique Features and Benefits

Features	Benefits
Typical MABR biological energy consumption 0.25 kWh/m³ (0.001 kWh/gal) >500 m³/d (132,000 GPD)	Save on energy and environmental footprint
Reduced carbon source requirement	Low chemicals consumption (Acetic acid)
Integral Bio-Phosphorus removal	Low chemicals consumption (alum), Smaller footprint
Simultaneous nitrification and de-nitrification	Cancel nitrate circulation Simple operation Low energy consumption Smaller footprint

Scope of Supply

Aspiral reactor arrives assembled with MABR membrane modules and internal air and water piping

Supplied in Standard Configuration
Fully equipped reactor
Blowers skid
Air piping
Electricity and control unit
Remote control software
Detailed process and hydraulic design
Supervision on installation and commissioning

Optional
Feed pump(s)
Distribution chamber
Pre-treatment screen
Clarifier (supplied standard in XS, S and M units)
Tertiary filter skid including secondary and tertiary water tanks

Site requirements - not in scope
Collection pit
Equalization tank
Earthworks
Concrete works
Interconnecting water pipes and valves
Sludge tank

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