

RapidSmart® - MBR Decentralised Sewage Treatment

RapidSmart® is a fully packaged sewage treatment plant suitable for applications sized for 50 - 250EP.

KEY FEATURES

- Modular and relocatable design for 250EP or less
- Locally manufactured to AS/NZ standards
- Seismic design for NZ and PNG
- Operational Service Agreements
- Water Reuse opportunity
- HyConnect® Remote Monitoring
- Simple site assembly – full plug and play



The system consists of the following process components:

- Fine screening – removal of plastics, rags, bags and other coarse material that is found in sewage
- Equalisation Tank – to even out peak flows during the morning and evening
- RapidSmart® MBR – consist of three zones, anoxic, aerobic followed by MBR Filtration
- Disinfection – sterilisation of bacteria, pathogens, viruses and coliforms via the use of UV Sterilisation and Chlorination
- Sludge Management (by others)

Sewage from the source will need to be pumped to the fine screen. The Fine Screen is an automatic system that removes and compacts coarse material found in sewage, such as plastics, bags and rags. These items need to be removed in order to protect the process equipment further downstream in the process. The screen operates intermittently via level control and all material removed is discharged into a bagging system for offsite disposal.

The screened effluent then gravitates into the equalisation tank, which is a holding tank fitted with submersible mixers to keep the contents fresh. The purpose of the equalisation tank is to buffer out peaks that occur during the morning and evening. The submersible mixers are mounted on rails and keep the contents fully mixed to avoid sedimentation and anaerobic conditions.

Flow from the equalisation is then pumped to the RapidSmart MBR for treatment.

There are three distinct zones within the RapidSmart as follows:

Anoxic Zone - in this zone a return stream of nitrate rich mixed liquor is denitrified to nitrogen, the flow then gravitates into the next zone

Aerobic Zone - in this zone organics and ammonia are oxidized to form mixed liquor, carbon dioxide and water. Aeration is provided via side channel blowers feeding an aeration grid. The aeration grid provides the necessary oxygen demand to remove the pollutants. The blowers operate under Dissolved Oxygen control to optimise energy usage.

MBR Zone - in this zone the mixed liquor is separated from the water phase using submerged flat sheet membranes. The water phase (effluent) gravitates to the downstream storage tank and the remaining mixed liquor is returned to the head of the process

The treated water finally undergoes UV, or chlorine sterilisation to inactivate viruses, bacteria, and coliforms. If used, chlorine is dosed from a 200L drum to a contact tank providing the required residence time for mixing.

DESIGN BASIS

Analyte	Basis	Analyte	Typical Range	Typical Effluent*
COD (g/EP)	120	COD (mg/L)	500 - 600	< 30
BOD ₅ (g/EP)	60	BOD ₅ (mg/L)	250 - 450	< 10
TSS (g/EP)	60	TSS (mg/L)	250 - 400	< 1
NH ₃ (g/EP)	12.5	NH ₃ (mg/L)	60 - 75	< 10
TP (g/EP)	2.5	TP (mg/L)	10 - 12	< 2
Flow (L/EP)	160 - 220			

*Consult Hydroflux for other discharge limits

TECHNICAL DATA

General Data and Sizes

Capacity (kL/d) - Design	10	20	40
Typical Flux Design Rates (LMH)	12 - 30		
Membrane Type	Submerged flat sheet		
Membrane Pore Size (micron)	0.08		
Membrane Material	PES		
Frame Material	304 or 316 stainless steel		
MBR Scouring (Nm ³ /h)	120	240	360
Typical Installed Power (kW)	14	16	32
Typical Footprint (L x W)	8 x 4	8 x 4	8 x 8
No. of Modules (exc. balancing)	1	1	1

RapidSmart Tank Sizes

Balance Tank HRT (hrs) - typical	8		
Balance Tank Size (kL)	42	84	126
Anoxic Zone (kL)	20	40	60
Aeration Zone (kL)	46	94	141

Aeration

Diffuser Length	1.5		
No. of Diffusers	17	34	50
SOTR (kg/h)	12	24	36
Air Demand (Nm ³ /h)	260	520	770
Backpressure (mBar)	410		

Sludge Production

Typical Dry Solids Load (kg/d)	2.5	5	10
WAS Volume (kL/d)	0.4	0.8	1.6

The above specifications are generic and will be dependent on each application.

The data presented is for indicative purposes only, and is not certified data for engineering design purposes.

Please contact Hydroflux for specific data.

Australia
1300 417 697
info@hydroflux.au
www.hydroflux.au

New Zealand
09 352 2052
info@hydroflux.nz
www.hydroflux.nz

Fiji & Pacific Islands
773 6950
info@hydroflux.com.fj
www.hydroflux.com.fj

HYDROFLUX
epco