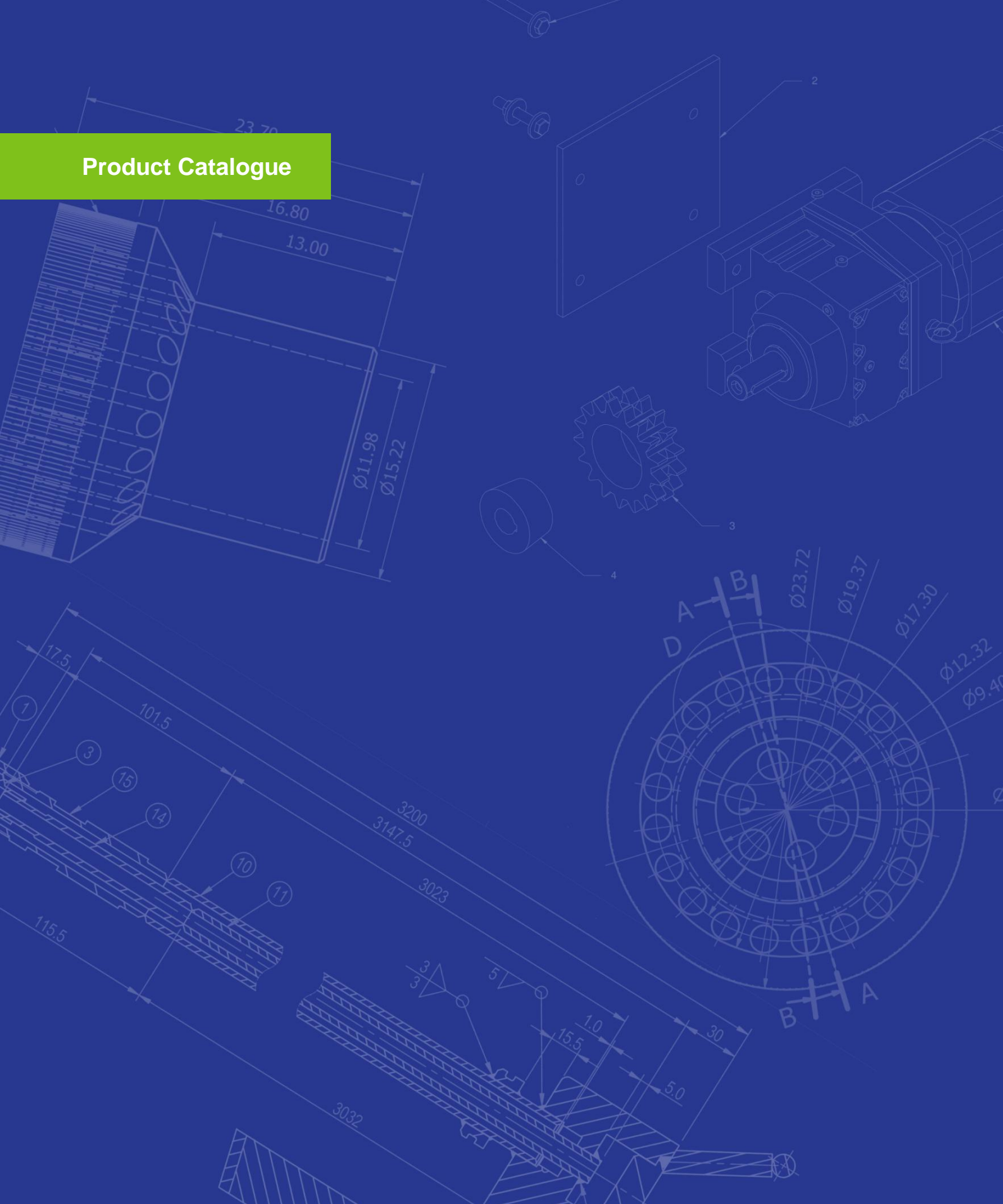


Product Catalogue





Product Catalogue

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Introduction and Overview

Treatment of water and wastewater is an ongoing challenge for communities worldwide. As environmental regulations increase, cost-effective and high-performing treatment solutions become integral.

At Syngineering, we draw on years' of experience in the design, testing and manufacture of water and wastewater treatment systems that are utilised in over 45 countries.

Experience

Syngineering provides effective solutions using high quality equipment for our clients throughout Australia and New Zealand. We recognise the imperative requirement in the industry for reliable equipment correctly matched for the application.

Our products have been designed for and installed in the following applications:

- ~ Municipal
- ~ Mining
- ~ Oil & gas
- ~ Food & Beverage Industries
- ~ Abattoir
- ~ Dairy
- ~ Defence
- ~ Commercial and residential developments

Quality products, tailored service

Our focus is on providing highly quality products for potable water, storm water and wastewater applications. Our unique combination of technical experience, access to equipment worldwide and product design, provides to our customers with an organisation that includes:

- ~ Consultancy
- ~ Bench, Pilot & Field Trials
- ~ Laboratory analysis, testing & reporting
- ~ Engineering design
- ~ Manufacturing
- ~ Installation
- ~ Onsite supervision
- ~ Commissioning
- ~ Drawings & Documentation
- ~ Operational monitoring and
- ~ System servicing
- ~ Maintenance
- ~ Operator Training

Syngineering treatment solutions vary from systems based on proven engineering principles through to advanced biological processes. Our

diverse range of products provides our customers with various options to achieve their water quality objectives to suit their budget and site constraints.

Syngineering is about building long term relationships with customers based on our company values:

Objectivity

We critically examine our solutions to ensure they align with our clients' objectives and desired outcomes.

Integrity

We always act with the utmost integrity, and choose what is ethical and right for our clients and the environment.

Respect

We treat our work colleagues, our clients, our suppliers and the community with respect.

Innovation

We encourage innovation, continuous improvement and learning.

Partnership

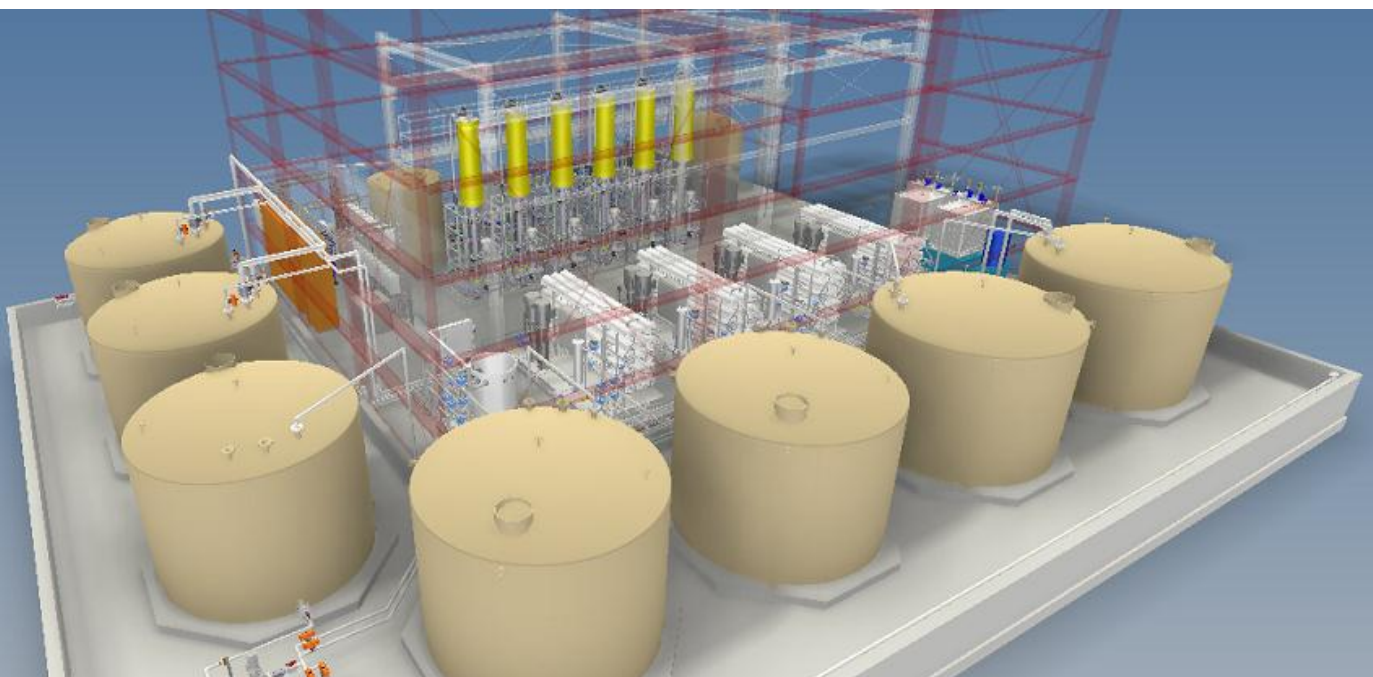
We take a personal interest in our clients' and colleagues success, and work with them as partners to help them reach their objectives.

The Syngineering Group

The Syngineering Group is based on the long term and not the short term quick sale.

You **WILL** be served by professional, practical, knowledgeable, efficient engineers and tradesman.

You **WILL NOT** be served by salespeople looking to make a quick sale.





Pump & Macerator Stations

ULTIMA Pump Stations have been successfully installed in thousands of projects over 25 years for various applications including industrial, sewer, stormwater and tradewaste. Each pump station is designed to meet site specific requirements and only uses equipment that has been tested and verified in the field. These packaged systems are proven, reliable and cost effective to install.

Distinctly recognisable by the external valve chamber, the ULTIMA Pump Station is packed with value and is the preferred pumping station for any high profile or essential services applications.

The patented ULTIMA Macerator Stations are designed for the macerating of sewer prior to pumping systems, preventing damage to equipment and pipe blockages. This unique design provides excellent serviceability, fast and easy installation, and peace of mind on particularly troublesome sites.

Macerator Stations are regularly used at airports, shopping centres, prisons, schools, hospitals and other public spaces.

1) Integral valve chamber:

Valves are kept out of environment, giving them longer life and they have a separate access point meaning no confined-space entry is required to service them

2) Epoxy coated cast iron valves

High quality, long lasting valves are used over conventional brass or PVC valves, providing long term reliability

3) Well-washer unit:

Programmed to operate after each pump operation, the well-washer will keep the station clean of build-up.

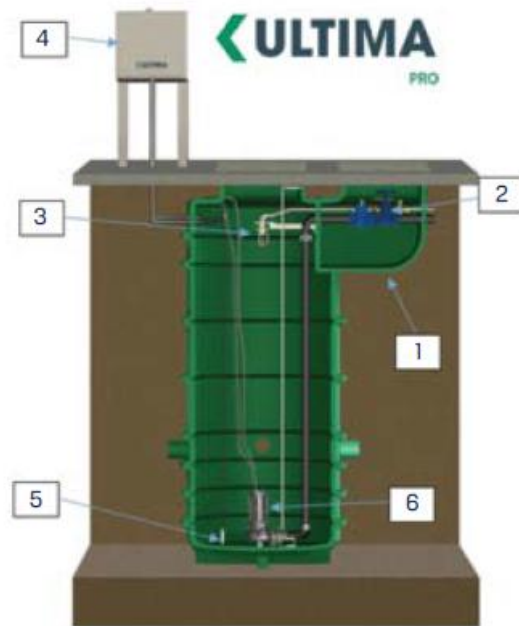
4) Advanced series controller:

State of the art control system with interactive digital display, data logging, MODBUS compatibility, full adjustability of parameters and liquid level display.

5) Hydrostatic level transducer:

This stainless steel, highly accurate, pressure sensor provides for greater reliability than conventional floats or probes with no moving parts to fowl up and also providing full adjustability at the control module without accessing the station.

6) Pumps:



Ultima Pumps are specifically selected on a project by project basis, from an exclusive range of local and international suppliers, to find the right pump for your application.



Our ULTIMA Macerator Stations are installed on the gravity sewer line prior to a pump station, or on the inlet connection within the pump station making them quick and easy to install, and amazingly accessible for maintenance



Screens

BS Bar Screens

The BS Series range of automatic rake bar screens are economically priced and well suited to smaller wastewater treatment plants. With simple practical design and all stainless steel construction, the BS bar screens are extremely reliable and suitable for harsh operating conditions.

Bar spacing ranges from 1.0mm to 50mm and a throughput capacity from 18m³/h to 290m³/h.



TE – Static Screens

The TE series Static screens offer an economic solution with continuous solid-liquid separation process with almost no maintenance requirements and no energy input at all.

The TE series screens are a good pre-treatment option for industrial waste water applications, removing high solids from waste streams from a variety of industries such as; paper, textile, tannery, laundry, canning and milk and abattoir industries etc. The screen aperture ranges from 0.5 to 1.5mm with a flow rate of up to 126m³/hr.



RD – Rotary Drum Screens

Our Escava RD series screens are a high capacity filter for difficult solid / liquid separation and an effective solution for wastewater pre-treatment. The Escava RD series screens are suitable for a wide range of process separation including food and beverage, paper and pulp, tanneries, textiles and other industrial applications.

Automatic cleaning of the drum filter is performed by an external cleaning scraper and an internal water jet system. Wedge wire apertures, range from 0.15mm up to 3.0mm and a throughput capacity from 2L/sec up to 150L/sec.



SC & DS Series – Screw Compactors

The SC & DS series – Screw compactors offer a number of options for headworks / inlet water and wastewater screening solutions. They can be supplied for an in-channel installation or dry mounted in a purpose built stainless steel tank. The SC & DS series come in a large number of models and configurations, suitable for small flow rates up to very large municipal flows



Grit Removal & Screw Conveyors

Screen PAK series

The ScreenPAK series combines the required wastewater pre-treatment stages into one compact, cost effective and simple to install package. High quality materials, recognized reliable brand components and competent workmanship ensure a long service life with minimal maintenance requirements. Plant operating costs are reduced as rejected screenings and grit are dewatered, cutting disposal costs.

The wastewater enters the Escava ScreenPAK unit and passes through a fine screen, removing floating and suspended matter. Grit and heavy solids settle in the grit removal chamber. The grit transport auger moves the grit against the incoming flow, washing out organic material.

The Escava ScreenPAK can be supplied with the optional integrated Fat & Grease removal system. The central low velocity zone is fitted with an aeration floatation and surface skimming system to effectively remove problem causing fat and grease.

Operation of the Escava ScreenPAK is fully automatic with inbuilt controls and monitoring system. Controls can be linked to a central plant SCADA system for full integration. An emergency bypass can be opened in the case of a power failure.



Grit separation

Grit separation systems combines the required wastewater pre-treatment stages into one compact, cost effective and simple to install package. High quality materials, recognized

reliable brand components and competent workmanship ensure a long service life with minimal maintenance requirements. Plant operating costs are reduced as rejected screenings and grit are dewatered, cutting disposal costs.



Screw conveyors

We offer a variety of screw conveyor systems for the municipal and industrial waste applications. High quality materials, recognized reliable brand components and competent workmanship ensure a long service life with minimal maintenance requirements. Plant operating costs are reduced as rejected screenings and grit are dewatered, cutting disposal costs.



Dissolved Air Flotation (DAF)

Dissolved Air Flotation (DAF) is a process used for the separation of suspended solids by addition of saturated air-water mixture which releases micro bubbles. The micro air bubbles adhere to or enmesh in the suspended composite particles, which then rise to the surface due to their reduced density. Skimming operation removes the particles floated to the surface.






DAF systems remove total suspended solids (TSS); algae; fats, oils and greases (FOG); and associated biological oxygen demand (BOD) and chemical oxygen demand (COD) from a variety of water and wastewater.



Clarifiers

Lamella clarifiers are designed for the continuous separation of sediments from water with two basic purposes: to increase the settling area and to obtain a laminar flow. These inclined lamella plates provide a large effective settling area with a small footprint. We can supply Lamella Clarifiers constructed from Epoxy coated steel, stainless steel and fibreglass.

Applications

-  Industrial waste water treatment
-  Municipal waste water treatment
-  Biological purification
-  Thickening in mining related industries
-  Other industrial applications

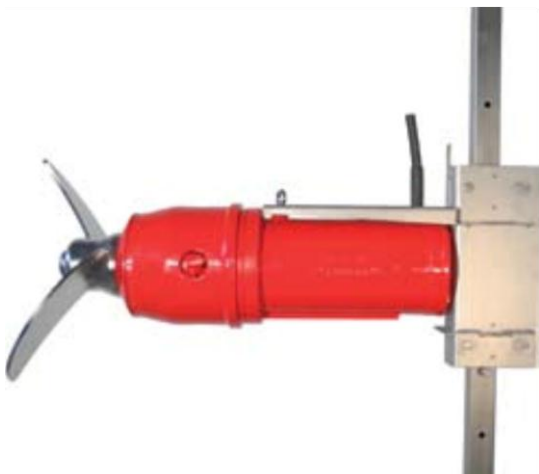


Orb Mixers



Orb - MX series

Our MX mixer range, offers a large variety of mixers ideally suited for wastewater treatment applications. Built for reliability and performance the MX mixers feature over-sized motor bearings, double shafts seal and an efficient self-cleaning impeller design. Various mounting systems are available



Orb - SML series

The SML mixers feature a slow speed mixer design for circulating water in oxidation ditches. Using a hydrodynamic structure analyses the impeller has been designed for both high-performance mixing and strength, producing a high thrust ranging from 700 to 3,200N.



Orb - SM series

The SM mixers feature full stainless steel construction for a long service life. The newly developed high efficiency thrust system generates a strong jet flow with low power consumption thanks to the unique propeller and shroud design. Wear resistance of the propeller is enhanced by a special hardening treatment.



Orb - PDM series

The PDM Series overhead mixers are an affordable quality mixing solution with high performances and low energy consumption. The engineered curved propellers have been optimised to keep friction loss to a minimum.

Standard mixers are suitable for application from 100L up to 1,500m³ basins.



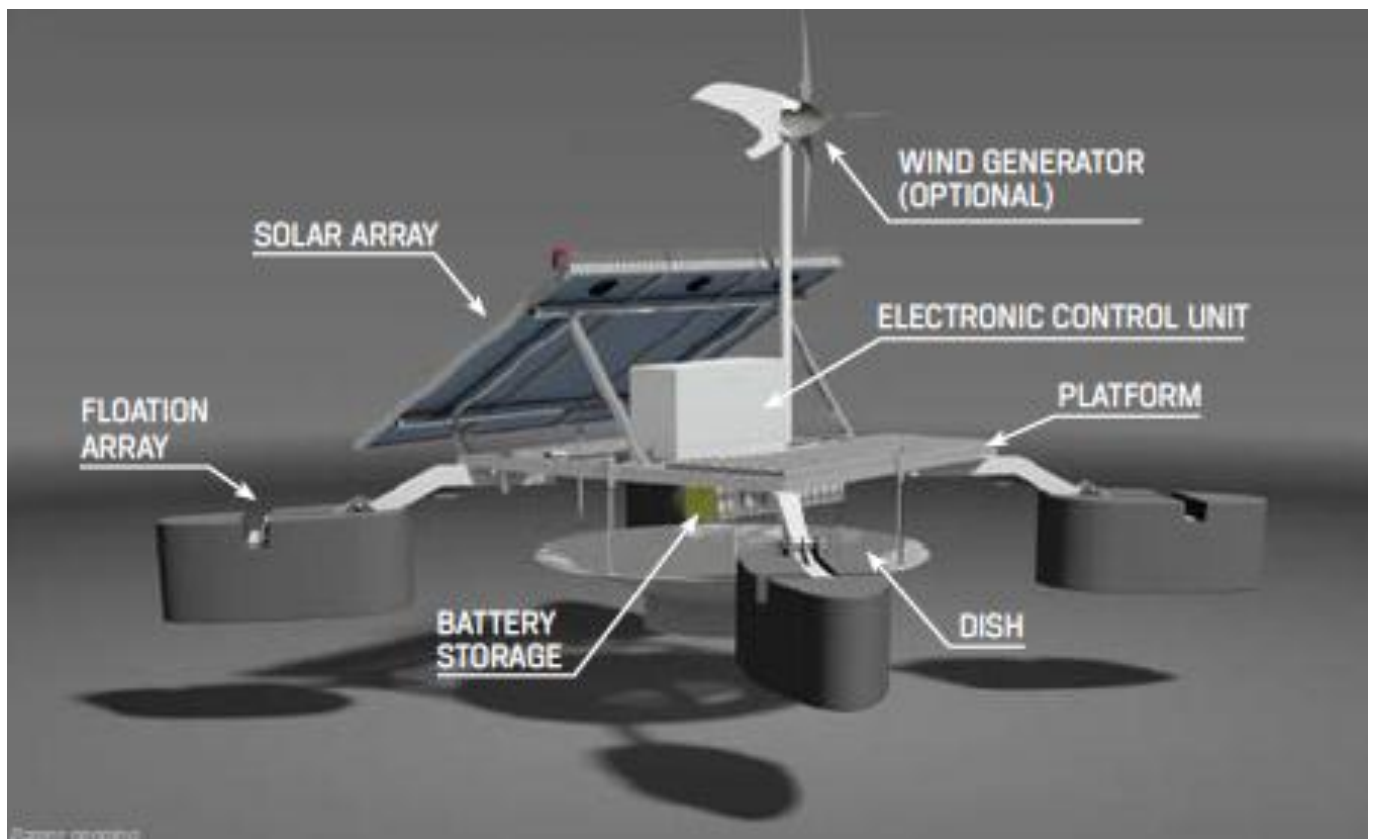
Orb Solar Mixer

Solar Powered Lagoon Mixing Controls Blue Green Algae

The ORB® SOLAR Mixer is a stand-alone solar-powered mixing system which harvests energy from the sun and wind and stores it in a highly efficient, on-board sealed battery unit. The combined capacity of the photovoltaic panels and battery allows for 24/7 operation without the need for mains grid supply. The ORB® SOLAR Mixer is mounted on a low-profile, stable, 4-float platform.

Key features

- Effective de-stratification of deep storage or facultative treatment lagoons.
- Significantly raises water overall DO levels.
- Prevent odours caused by stagnant anaerobic sludge layers.
- Powerful 450 watts of solar power with battery storage.
- Each unit capable of positively effecting several hectares of water surface area.
- Australian designed and manufactured.



Blowers

Side Channel Blowers and Exhausters

The side channel blower or exhauster increases the pressure of the aspirated gas by a series of vortexes in the 'peripheral toroidal channel' - created by the centrifugal thrust of the impeller. Whilst the impeller is rotating, the vanes force the gas forward and outwards, producing a helical motion. During this motion, the gas is recompressed repeatedly with a consequent linear pressure increase along the length of the channel.

Applications and advantages

Side channel blowers are suitable for applications requiring considerably higher pressures than that which can be achieved using centrifugal fans.

The rotating parts are not in contact with the casing. There is therefore no friction loss during operation and thus no internal lubrication is required. Air passing through the machine therefore remains uncontaminated and completely oil-free.



Other advantages of using side channel machines are:

- Easy installation
- Low noise level
- No vibration and therefore complete dynamic stability
- Pulsation free discharge
- Minimal maintenance.

Blowpak Enclosures

Lined with dense acoustic insulation, the Blowpak® is an effective option for reducing blower noise emissions.

Blowpak® enclosures can be custom manufactured to suit your requirements - including powder coat finish, galvanised, 304 and 316 stainless steel. Other options available include:

forced air ventilation, a lockable catch and electronic sensors for monitoring system operation.



Side Channel Blowers for Combustible Gases

Blowers for biogas, natural gas or combustible gases, in conformity with the 94/9/EC Directive (ATEX) Zones 1 and 2.

Features of construction

A specific range of TRENT® blowers have been developed to extract or compress combustible gases, such as biological gas or methane gas. The main characteristics of construction of these machines are:

- Casing and impellers manufactured with completely spark proof aluminium alloy
- Static parts in contact with the gas are impregnated with Loctite
- Casing halves sealed
- Shaft sealing - using special lip seals which do not require lubrication
- Explosion-proof electric motors, with minimum protection class Ex-d IIB T3 – IP55 for Zone 1; non-sparking motors, with maximum protection class Ex-nA II T3 – IP65 for Zone 2.

Motors that conform to NEMA, SABS and other Standards can be supplied upon request. For motors up to 4 kW, the blowers are manufactured with a "CLOSE COUPLED" version.

Larger blowers employ flexible or belt drives and in these cases, the safety drive guards are made from spark-free material.

The most common fields of application

- Landfill biogas recovery to feed torch, burner or gas engine;

- Tank, plant or contaminated soil gas recovery to feed torch or burner;
- Extraction of biogas from gasometer, natural gas from pipeline or gasometer and burner or gas engine feeding

Aggressor Blowers

AGRS series

The AGRS series blowers feature high quality and large capacity blowers for the heavy industrial and municipal industry. The AGRS series are available in high efficiency roots type blowers or turbo fans. They are fitting with quality acoustic enclosures, made from galvanised or stainless steel sheet, suitable for indoor and outdoor applications.

- Flow rates: 20 – 20,000 m³/hr
- Discharge pressure: 0 – 100 kPa
- Motor sizes: 0.25 – 500 kW
- Outlet: DN50 – 500



RB series – submersible blower

The RB submersible Helical Rotor Blower is a direct drive, Roots-type blower designed for installation within the process tank. The RB Blower has unique advantages including: extended life and reduced maintenance due its cool water environment, near silent operation and substantial space saving.



ARS / ARH series

The ARS & ARH-S Rotary Lobe positive displacement blowers are built to high quality standards and are renowned for their reliability and efficiency. The high efficiency ARS series blower features an air cooling system to reduce gear and bearing oil temperatures and a patented progressive discharge design which reduces output noise.

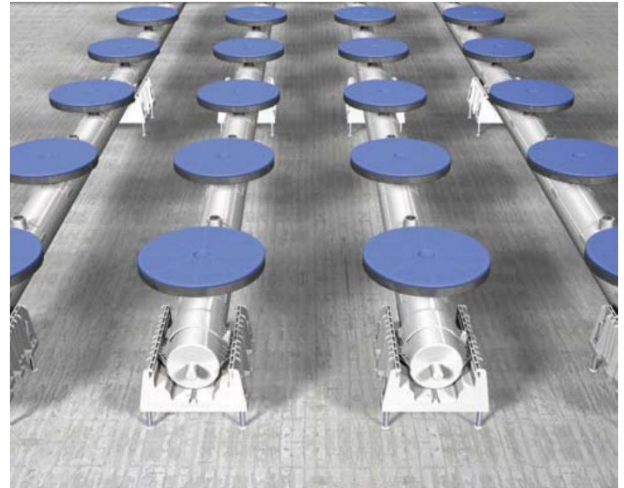


Diffused Aeration

Aeration diffusers - OTT series

OTT Series aeration diffusers offer a 'state of the art' flooded tube, low buoyancy aeration diffuser system providing uniform fine bubble distribution and high operating efficiencies.

Each diffuser is individually tested to high quality control specifications to ensure product uniformity and long term impressive performance. The OTT diffuser systems feature a unique quick-connect coupling device which is simple and fast to install



Diffuser grid systems - OTT AirRex series

OTT AirRex®, the all new, reinforced polypropylene revolutionary clip together diffuser grid system. This is the first plastic piping assembly designed expressly for aeration service, available as a kit. With the patent pending connection system and the specially designed supports, the lightweight OTT AirRex® system is extremely fast to install.



Aerators

Spiral aerators

Our spiral series aerators are used to introduce oxygen into lagoons, equalization tanks or activated sludge basins. In addition to a fine-bubble deep aeration they also provide excellent circulation and mixing. Motor capacities range from: 1.5 kW to 45 kW.



AGV series – high speed aeration

The AGV series high-speed floating surface aerator is designed to be used in lagoons, tanks and basins where there are varying water levels. The AGV is a mechanical high-speed aerator mounted on a fibreglass, steel reinforced float, filled with close cell polyurethane foam. The AGV is designed to be anchored in 3 or 4 points. Motor capacities range from: 1.5kW to 22kW.



AJ series - jet aerators

The ejector aerator is an inherently simple but effective means of aeration and mixing with low maintenance and excellent reliability. Jet ejectors can be adapted to a variety of process tank shapes and sizes with multiple outlets models available. Custom mounting systems are available. Motor capacities range from: 0.5 kW to 45 kW.



ASP-V series – low speed aeration

The ASP floating aerator systems are manufactured to high quality standards and are suitable for a range of water and wastewater aeration applications. They can be installed on a fixed bridge or setup on a floating system. The ASP can be customised to best suit the requirement with different types of turbines, motors and gear boxes available. The ASP floating aerators boast a very high oxygen transfer rate. Motor capacities range from 0.75kW to 75kW.





SC/SCLK series – radial aeration

The SC and SCLK series submersible aerators are naturally aspirating and feature simple installation, high reliability, excellent mixing characteristics, and high oxygen transfer rates. SC submersible aerators are a cost effective solution for use in municipal, industrial and agricultural wastewater treatment plants and are particularly suitable for round reactor tanks. Motor capacities range from 1.5 KW to 90 KW.



AquaBeads

Suspended Biofilm Carriers

Aquabead Suspended Biofilm Carriers, along with the SCBR process, provide an innovative advancement to biological wastewater treatment plants.

The SCBR or Suspended Carrier Biofilm Reactor process incorporates a multitude of AquaBEAD® carriers which are loaded into a bioreactor and circulated by aeration or mixing currents. The uniquely designed AquaBEAD® profile affords an enormous protected surface area for attached biofilm growth and this large surface area-to-volume ratio allows reduced process tank sizing and increased substance removal rates.

AquaBEADs® can be used in new wastewater treatment plants or can be easily retrofitted to existing plants with minimal alterations, with a resultant increase in operational performance and system stability.

Key features

- Compact reactor tank design – tank volume requirements may be reduced by up to 80%, saving construction and transport costs.
- Robust biofilm process – high resistance to shock loads or temporary TOC and nutrient depletion.
- Easy upgrading of existing plants – increased capacity may allow major plant upgrades to be delayed.
- Easy to operate and control – operation is similar to conventional treatment processes.
- High BOD/COD and nitrogen removal performance can be used in both aerobic and anaerobic processes.
- Exceptionally long sludge ages are possible – allows time for specialized bacteria to colonise and breakdown difficult-to-remove substances.
- No biomass washout during heavy loads – safe reliable operation.
- Highly efficient removal of soluble organic and nitrogen loads.
- Utilizes the entire reactor volume – better performance than fixed film processes which are affected by aeration and turbulence shadow zones.

Aquabead® SCBR Process Description

AquaBEAD® suspended biofilm carriers are manufactured using a mineral filled polyethylene with a density slightly heavier than water. The

biofilm carriers are kept in suspension and in continuous movement by turbulence from the aeration or mechanical mixing.

As the carriers pass through the turbulent aeration plume, shearing forces slough excess biomass to maintain an optimum biofilm thickness on the carrier surfaces for efficient oxygen utilization.

The AquaBEAD® carriers are retained within the bioreactor by a simple sieved outlet screen.

Due to continuous movement of the carriers, the system is not prone to clogging and does not need to be backwashed. The process is self-cleaning and requires no special maintenance.

AquaBEAD® suspended carriers can be utilized in various system configurations including pre-treatment or roughing reactors, single pass reactors for BOD/COD removal and activated sludge systems for nitrogen and phosphorus removal.



Aquabead® SCBR process allows flexible design options

SIMPLE AQUABEAD® SCBR PROCESS

- Compact and simple plant design
- Single or dual tank design with no return sludge circulation
- Ideal for BOD/COD removal
- Nitrification and denitrification can be achieved within the same tank

AQUABEAD® SCBR COMBINED WITH ACTIVATED SLUDGE PROCESS

- Provides a compact, efficient & high performance plant
- Single tank or dual stage tanks designs for high nitrogen and phosphorous removal

- Can be added to existing activated sludge plants to upgrade performance
- Suitable for a variety of wastewater types including: municipal, breweries, paper & pulp and food & dairy
- Ideal for Aquaculture recirculating systems

AQUABEAD® SCBR COMBINED WITH MEMBRANE BIOREACTOR SYSTEM

- Allows a compact plant design with a small footprint area
- Allows exceptionally long sludge ages for specialised bacteria to form
- Class A effluent for water reuse applications

AQUABEAD® SCBR USED AS A ROUGHING REACTOR

- Typically used as a pre-treatment process to reduce BOD/COD loading prior to a conventional activated sludge plant
- Protects nitrifying bacteria from shock due to toxic loads
- Can be used to extend the operational life of an outgrown conventional activated sludge plant



AquaBEAD® specifications

Type	> AB03-2*
Dimensions	> 810mm x 7mm
Density	> 1.05g/cm ³
Material	> Mineral filled polyethylene
Total surface area	> 860m ² /m ³
Protected surface area	> 560m ² /m ³
Protected surface area @ 66% fill**	> 375m ² /m ³
BOD ₅ oxidation rate	> 6700g BOD ₅ /m ³ .d (@15°C, ≥80% removal)
Oxygen transfer rate	> 9.0g O ₂ /Nm ³ .m
Nitrification	> 445g NH ₄ -N/m ³ .d (@15°C)
Denitrification	> 750g NO _x -N/m ³ .d (@15°C)

* Other AquaBEAD® carrier types are available for special applications, e.g. where fibrous material is present.

** Fill volume is typically between 33% and 66% (maximum) of reactor volume.

Contact: MBR Technologies for design application information.



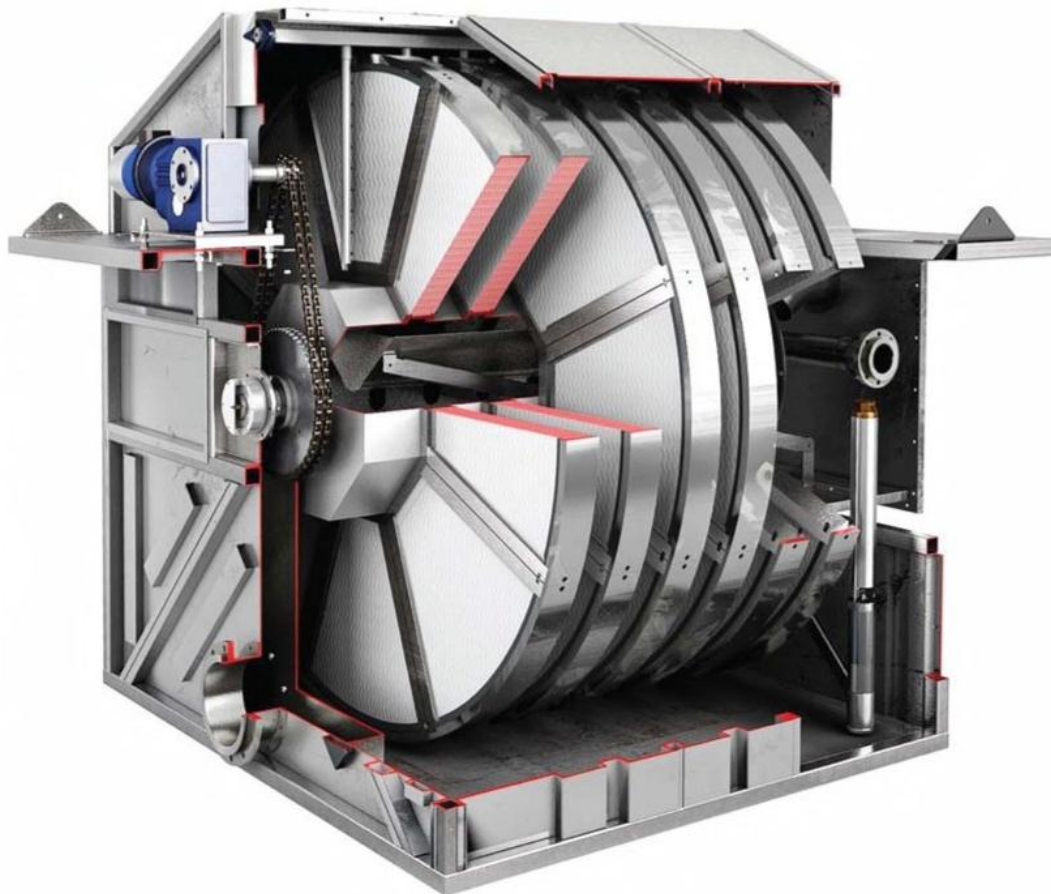
Microfiltration Systems

The SMT Disc systems are a high quality microfiltration system, featuring stainless steel construction and a built in **backwashing system**, inspection covers and automatic controls, Surface areas range from 12 to 125m², with maximum flow rates from: 1 to 8.6L/sec.

Media filtration

Media Filtration systems function through physical capture of pollutants, as well as adsorption of pollutants through chemical reactions. We offer a variety of media sources including; Quartz sand, Silica sand, Glass media, Zeolite, Anthracite coal, Garnet, Magnetite, etc.

Our media filtration systems can be supplied loose or packaged up on a skid system with pre-coagulation and post disinfection etc.



Flat Sheet Membranes

Submersible Flat Sheet Membrane Bio-Reactor

Membrane Bio-Reactors have become recognized as a state-of-the-art wastewater treatment technology. Being German manufactured, it is clearly at the forefront of the field with its unique patented flat sheet composite polymer membrane which is resistant to fouling, clogging and braiding. Its advanced design, combined with an inherent simplicity of construction, provides unsurpassed operational efficiency, performance and reliability.

Flat sheet ultrafiltration membrane

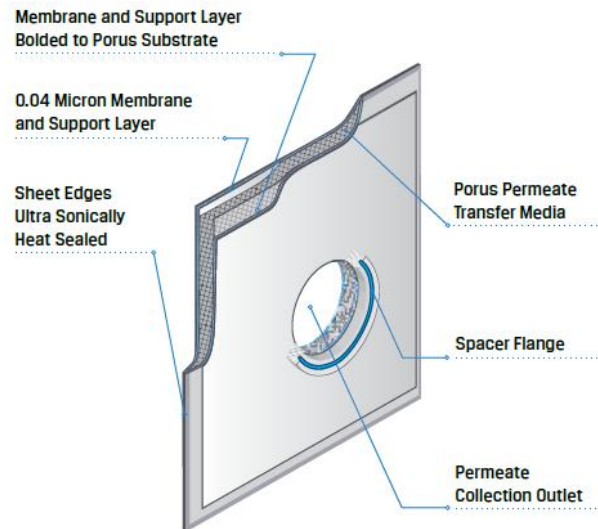
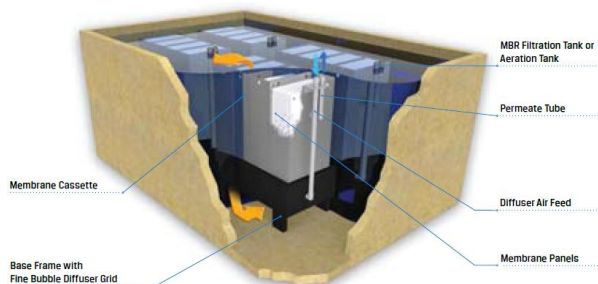
With a pore size of 0.04 microns, the membrane effectively blocks all bacteria and most viruses. Manufactured from permanently hydrophilic polyether sulfone (PES), the membrane provides consistent stable operation, high flux rates and low transmembrane pressures.

Membrane construction

The unique flat sheet composite polymer bonded membrane panel is formed in a continuous process by fusing the smooth ultrafiltration membrane sheets onto a strong porous fibre central substrate. Membrane panels are trimmed to size, edges ultrasonically heat sealed and a centrally located spacer flange is adhered in place. Each membrane panel is individually tested for integrity. During assembly, the spacer flanges are joined together to form a central permeate collection manifold.

Pressure backflush using permeate water

Due to its unique and robust membrane structure, it is the only flat sheet membrane module capable of being pressure back-flushed using permeate water. Fully automatic backflush cleaning cycles help maintain stable flux rates. As a result of the permeate water backflush, the need for chemical assisted cleaning is greatly reduced with the benefit of significant savings in chemical costs, safer operation and less impact on the environment.



Resistance to fouling, clogging and braiding

Our smooth flat sheet ultrafiltration membrane panels are suspended within the cartridge frame with a gap around all sides and are naturally resistant to fouling and braiding with hair or fibres, a problem which plagues hollow fibre and capillary type MBR membranes.

During filtration, aeration scouring causes the membrane panels to flex which assists in preventing clogging

› Flat sheet membrane specifications

MEMBRANE SURFACE AREA		m ²	10	25	50	100	400
Rated flow	L/Hr		170	425	850	1700	6,800
Rated flow	m ³ /day		4	10	20	40	160
Peak flow	L/Hr		300	750	1500	3000	12,000
Rated flux rate*	L/Hr/m ²		17	17	17	17	17
Peak flow flux rate**	L/Hr/m ²		30	30	30	30	30
Filtration suction pressure	mbar		50 - 400	50 - 400	50 - 400	50 - 400	50 - 400
Backflush pressure max.	mbar		150	150	150	150	150
Operating temperature	°C		5°C - 40°C	5°C - 40°C	5°C - 40°C	5°C - 40°C	5°C - 40°C
pH range			2 to 11	2 to 11	2 to 11	2 to 11	2 to 11
Standard specific aeration***	m ³ /m ²		0.6	0.6	0.6	0.6	0.4
Air scour flow required	m ³ /Hr		6	15	30	60	160
Air scour flow required	m ³ /min		0.1	0.25	0.5	1	2.7
Membrane material			PES	PES	PES	PES	PES
MWCO	kDa		150	150	150	150	150
Pore size	µm		0.04	0.04	0.04	0.04	0.04
Chlorine resistance	ppmh		100,000	100,000	100,000	100,000	100,000
Maximum suspended solids	g/L		12	12	12	12	12
Minimum suspended solids	g/L		4	4	4	4	4
Cassette type			1 x C10	1 x C25	2 x C25	4 x C25	4 x C100
Cassette frame material			PVC	PVC	PVC	PVC	PVC
Base frame material			PE	PE	PE	PE	PE
Connections: Permeate			1" PVC socket	1" PVC socket	Flange DN32	Flange DN32	Flange DN100
Aeration			1¼" PVC socket	1¼" PVC socket	Flange DN32	Flange DN32	Flange DN65
Dry weight	kg		-	-	125	225	800
Wet weight	kg		-	-	200	300	1100
Length base frame			-	-	586	1270	1298
Length total	mm		313	483	1024	1600	1810
Width	mm		630	630	702	702	1152
Height	mm		1575	1575	1563	1563	2763

Membrane Bio Reactors (MBR)

Packaged wastewater Treatment System

The MemPAK MBR® is an advanced 'plug and play' packaged MBR wastewater treatment system featuring the flat sheet submerged MBR ultrafiltration modules. The MemPAK MBR® is engineered to provide a high quality effluent, treated to Class A standards and suitable for a variety of reuse applications.

The fully pre-assembled and factory tested MemPAK MBR® plant is supplied in an ISO shipping container format for ease of transportation.

Primary and bioreactor tanks are open topped with safety railings around access points. Permeate pumps, aeration blower, dosing systems, monitoring and control systems are housed in a lockable control room located at the front of the plant.

The pre-programmed PLC system includes full process monitoring and data logging functions. Full telemetry including remote control is available as an option. The MemPAK MBR® is designed to require minimal operator supervision making it ideal for installation in remote locations.

Key features

- Plug and play packaged system
- Automatic fine influent screen
- Flat sheet MBR module
- 0.04µm Ultrafiltration membrane
- Automatic cyclic membrane backwash and CIP System
- Proven design
- Fully Factory Tested
- Systems available from 10 - 500KL/day
- Compact and easy to transport
- Optional UV disinfection
- Optional chlorine disinfection with safety eyewash, signage and bunded chemical storage
- Optional effluent monitoring system with remote telemetry

Treatment stages

The MemPAK MBR® package plant is a fully self-contained MBR wastewater treatment system incorporating the following process stages:

1. Inlet screening
2. Primary / Anoxic tank - Denitrification
3. Aeration / Membrane Bioreactor tank - Nitrification
4. BIO-CEL® membrane filtration modules
5. Permeate receiving and disinfection
6. RAS and sludge removal



› MemPAK specifications

MemPAK MBR® MODEL	UNIT	MemPAK MBR-15	MemPAK MBR-30	MemPAK MBR-60	MemPAK MBR-100	MemPAK MBR-150
Rated flow	L/Hr	625	1250	2500	4165	6250
Rated flow	m ³ /day	15	30	60	100	150
Operating temperature	°C	5°C - 40°C	5°C - 40°C	5°C - 40°C	5°C - 40°C	5°C - 40°C
Power requirements	Phase/ kW	Single phase *	3 phase *	3 phase *	3 phase *	3 phase *
Design influent:						
BOD5	mg/L	300	300	300	300	300
COD	mg/L	600	600	600	600	600
TKN	mg/L	max 50	max 50	max 50	max 50	max 50
TSS	mg/L	450	450	450	450	450
Temperature	°C	15	15	15	15	15
pH		6.5 - 8.5	6.5 - 8.5	6.5 - 8.5	6.5 - 8.5	6.5 - 8.5
Expected effluent:						
BOD5	mg/L	< 10	< 10	< 10	< 10	< 10
COD	mg/L	< 100	< 100	< 100	< 100	< 100
Ntot	mg/L	< 10	< 10	< 10	< 10	< 10
TSS	mg/L	< 2	< 2	< 2	< 2	< 2
Turbidity	NTU	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
(With UV and post Chlorination) E.Coli	CFU/100mL	< 1	< 1	< 1	< 1	< 1
Membrane surface area	m ²	50	100	200	300	400
Membrane material		PES	PES	PES	PES	PES
MWCO	kDa	150	150	150	150	150
Pore size	µm	0.04	0.04	0.04	0.04	0.04
Chlorine resistance	ppmh	100,000	100,000	100,000	100,000	100,000
Operating suspended solids	g/L	8 - 12	8 - 12	8 - 12	8 - 12	8 - 12
Dimensions	Container	20' ISO	20' ISO	40' ISO	40' ISO	40' ISO**

Ultrafiltration (UF)

ULTRAFILTRATION PACKAGED SYSTEM

A consistent and reliable supply of clean water is essential to sustain a healthy and safe living environment. Our valuation of this precious resource is ever increasing. Rising costs of treatment and the challenges of providing adequate supplies of safe drinking water is leading many high volume users to look at ways of recovering and recycling water for use in less critical or non-potable applications. At the same time, authorities are tightening up on allowable contaminate discharge levels, particularly where effluent is discharged into natural rivers, lakes or the sea.

Wastewater recycling

Municipal wastewater is typically around 99% water. With modern treatment techniques, clean water can be extracted and purified to a level which is safe for use in a multitude of non-drinking water applications.

The MemPAK UF® wastewater polishing package plant has been designed to accept treated effluent from a conventional wastewater treatment plant and to purify the extracted water to a high level suitable for a variety of reuse applications.

Key features

- ↻ Factory assembled and tested
- ↻ Plug and play design
- ↻ Capable of 6.5 log reduction of viruses
- ↻ Large capacity inlet media filtration
- ↻ Automatic media and membrane backwashing
- ↻ Ultrafiltration membrane by Dow
- ↻ Automatic membrane pressure decay integrity testing
- ↻ PLC controls with touch screen
- ↻ Online monitoring and data recording system
- ↻ Optional remote monitoring and control
- ↻ Optional UV sterilization
- ↻ Optional Chlorine dosing and monitoring
- ↻ Optional RO stage for high quality filtrate
- ↻ Small footprint
- ↻ Standard Skid frame design
- ↻ Optional fully containerised package
- ↻ Robust design using quality components for long service life

Membrane filtration for wastewater polishing

- ↻ Membrane filtration has become the key tertiary treatment process used in water-for-reuse systems.

An Ultrafiltration membrane system provides a positive barrier screen which eliminates all bacteria and most viruses.

Further treatment stages are often added for multiple barrier protection including UV sterilization, chlorine disinfection and reverse osmosis filtration.



Applications

MemPAK UF® provide an effective and reliable treatment of wastewaters purified to a level for safe water-for-reuse applications.

The large capacity, automatic back-flushing inlet media filter protects the membranes and allows for varying inlet water quality.

Ultrafiltration is an ideal pre-treatment to reverse osmosis systems.

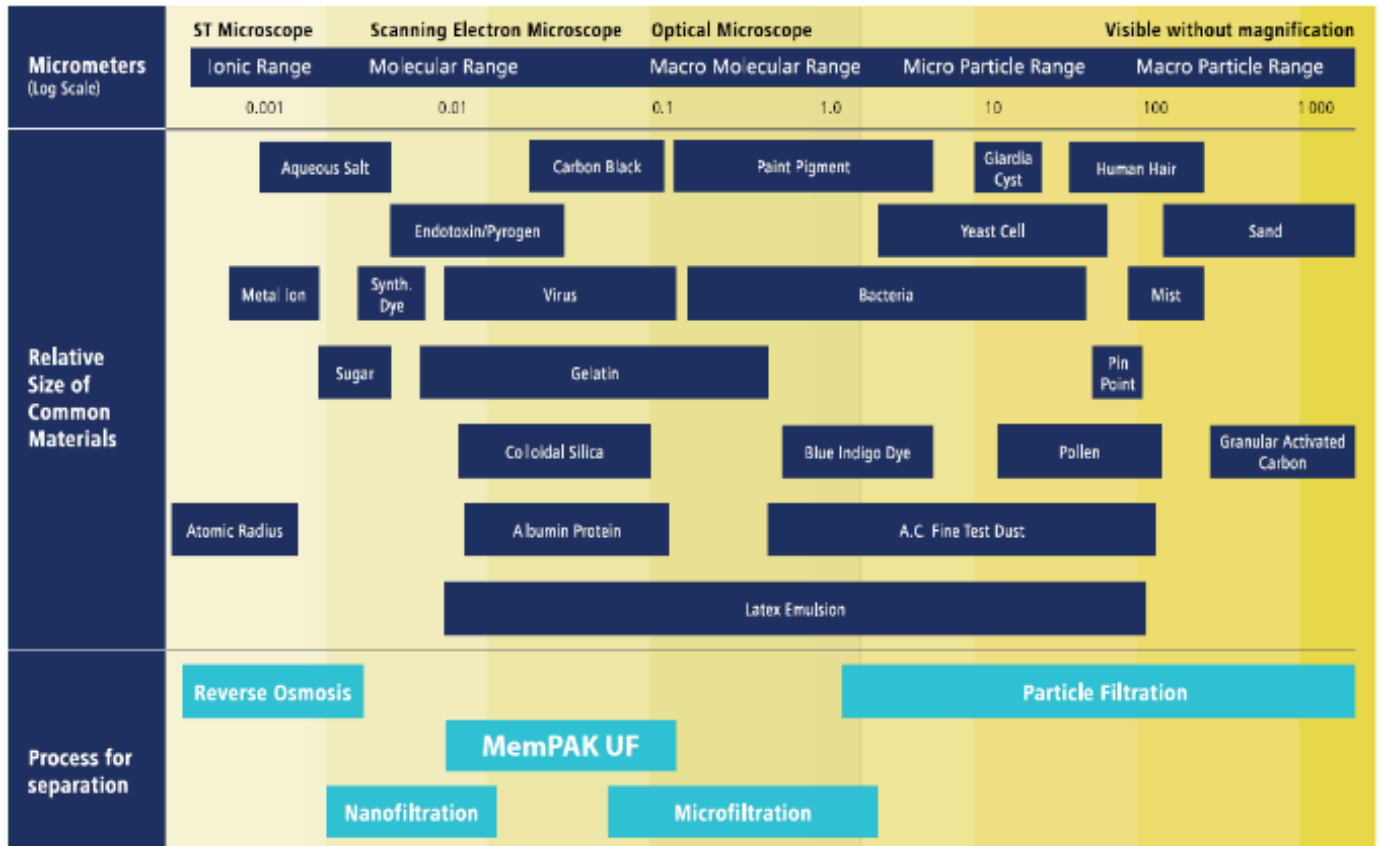
Typical wastewater sources include:

- ↻ Effluent from Municipal / Sanitary wastewater treatment plants
- ↻ Wastewater from textile and laundry industries
- ↻ Wastewater or treated effluent from food and beverage industries
- ↻ Hydroponic nurseries

Typical uses of recycled water include:

- ↻ Spray irrigation > Cooling towers
- ↻ Boiler feed > Toilet flushing
- ↻ Plant wash down
- ↻ Cooling towers
- ↻ Toilet flushing

› Micron size and substance removal



› MemPAK MBR® specifications

QUALIFIED FEED WATER QUALITY PARAMETERS

MODEL	RATED FLOW (m ³ /day)	PARAMETER	Unit	DESIGN BASIS	MAXIMUM ALLOWABLE
MemPAK UF-10	10	Turbidity	NTU	< 50	300
MemPAK UF-20	20	TOC	mg/L	< 10	40
MemPAK UF-30	30	Particle Size	Micron	< 150	300
MemPAK UF-50	50	COD	mg/L	< 20	60
MemPAK UF-75	75	Oil/ Grease	mg/L	0	< 2
MemPAK UF-100	100	pH continuous	-	6 - 9	2 - 11
MemPAK UF-150	150	Temperature	°C	25	40
MemPAK UF-200	200	Cl2 continuous	mg/L	0.5	200
MemPAK UF-250	250	TSS	mg/L	< 50	100
MemPAK UF-300	300				
MemPAK UF-400	400				
MemPAK UF-500	500				
MemPAK UF-600	600				
MemPAK UF-750	750				
MemPAK UF-1000	1.0ML/day				
MemPAK UF-1250	1.25ML/day				
MemPAK UF-1500	1.5ML/day				
MemPAK UF-2000	2.0ML/day				

Reverse Osmosis (RO)

REVERSE OSMOSIS packaged systems
 The MemPAK RO® and MemPAK SWRO® series, suitable for the most demanding applications, are designed for industrial, brackish and sea water applications.

The MemPAK RO® and MemPAK SWRO® systems remove salts, organic materials, impurities and other contaminants from water. They are also capable of rejecting bacteria, sugars, proteins, particles, dyes, and other constituents that have a molecular weight of greater than 150-250 Daltons. The MemPAK RO® and MemPAK SWRO® systems are engineered using 3D computer modelling and process design and can be completely customised to best suit your needs.



- Turbidity must be removed
- 20-80 psi feed water pressure.
- Note: a suitable feed pump can be supplied
- Max 0.05 ppm iron tolerance
- 0-1000 ppm feed water TDS. The MemPAK RO® can be designed for higher levels
- 3-11 pH range
- 25 ppm Silica tolerance @ 60% recovery

MemPAK SWRO® Industrial Sea Water Reverse Osmosis Packaged

- Systems
- Standard features
- 8" TFC spiral wound membranes
- Powder coated, welded steel frame
- 5 micron pre-filter
- 415V 3 phase power supply
- PLC based control panel
- Ampco ZC-2 feed pump. 3 phase Sea water resistant 2205 S/S
- Danfoss high pressure piston pump, 2205 S/S
- Siemens S7-200 PLC based control panel & VFD
- Permeate TDS monitor
- Stainless steel high pressure piping
- Low / high pressure switches
- Permeate conductivity monitor
- Permeate & concentrate flow meters
- Clean-in-place (CIP) system (HDPE tank, cartridge filter, pump and control panel)

MemPAK RO® Industrial Brackish Reverse Osmosis Packaged Systems

Standard features

- 8" TFC spiral wound membranes
- Powder coated, welded steel frame
- Stainless steel multistage pump
- 5 micron pre-filter
- 415V 3 phase power supply
- PLC based control panel
- Programmable time delay and set points
- NEMA 12 enclosure with disconnect and interlocking rotary handle
- High and low pressure switches
- Grundfos stainless steel multi-stage pump
- Permeate conductivity monitor
- Permeate & concentrate flow meters
- Clean-in-place (CIP) system (HDPE tank, cartridge filter, pump and control panel)

Operation specifications

- Max 42°C feed water temperature
- Hydrogen Sulphide must be removed

› MemPAK RO® & SWRO® specifications

MODEL	PERMEATE OUTPUT (m ³ /day)	QTY OF MEMBRANES	MOTOR HP	APPROXIMATE DIMENSIONS (mm)			APPROXIMATE WEIGHT (kg)
				Length	Width	Height	
MemPAK RO-15	15	3 x 4"	1.5	534	635	1397	90
MemPAK RO-30	30	6 x 4"	2	534	762	1397	130
MemPAK RO-50	50	9 x 4"	3	3454	1092	1524	340
MemPAK RO-85	85	15 x 4"	5	3454	1092	1524	409
MemPAK RO-100	100	18 x 4"	7.5	3454	1092	1727	460
MemPAK RO-135	135	5 x 8"	10	4320	840	1475	1090
MemPAK RO-160	160	6 x 8"	15	5335	915	1475	1135
MemPAK RO-215	215	8 x 8"	15	6350	915	1475	1185
MemPAK RO-275	275	10 x 8"	20	5335	915	1475	1230
MemPAK RO-330	330	12 x 8"	20	4320	1220	1680	1275
MemPAK RO-400	400	15 x 8"	25	5335	1220	1680	1455
MemPAK RO-490	490	18 x 8"	25	6350	1575	1680	1590
MemPAK RO-540	540	20 x 8"	25	5335	1575	1680	1900
MemPAK RO-650	650	24 x 8"	25	6350	1575	1680	2160
MemPAK RO-750	750	28 x 8"	30	8890	1830	2030	2045
MemPAK RO-850	850	30 x 8"	30	8890	1830	2030	2045
MemPAK RO-1000	1000	36 x 8"	40	8890	1830	2030	2230
MemPAK RO-1200	1200	42 x 8"	40	8890	1830	2030	2360

MODEL	PERMEATE OUTPUT (m ³ /day)	QTY OF 8" MEMBRANES	MOTOR HP	APPROXIMATE DIMENSIONS (mm)			APPROXIMATE WEIGHT (kg)
				Length	Width	Height	
MemPAK SWRO-30	30	2	15	3050	1070	1830	1180
MemPAK SWRO-45	45	3	25	4065	1070	1830	1180
MemPAK SWRO-60	60	4	30	4065	1524	1830	1227
MemPAK SWRO-90	90	6	45	4950	1524	1830	1454
MemPAK SWRO-120	120	8	65	4950	1830	1830	1910
MemPAK SWRO-180	180	12	80	4950	1830	1830	2545
MemPAK SWRO-240	240	16	85	7112	1830	1830	2954
MemPAK SWRO-360	360	24	100	7112	1830	2034	5910
MemPAK SWRO-420	420	28	110	7112	1830	2034	6363
MemPAK SWRO-515	515	30	120	8890	1830	2034	6820
MemPAK SWRO-635	635	42	130	8890	1830	2034	7954
MemPAK SWRO-740	740	49	150	8890	1830	2034	7954
MemPAK SWRO-850	850	56	175	8890	1830	2034	7954
MemPAK SWRO-950	950	63	190	8890	1830	2034	8180
MemPAK SWRO-1060	1060	70	190	8890	1830	2034	8636
MemPAK SWRO-1200	1200	84	290	8890	2159	2034	9545
MemPAK SWRO-1600	1600	105	320	8890	2159	2034	9990
MemPAK SWRO-1900	1900	126	320	8890	2159	2058	11000

Sequential Batch Reactor (SBR)

Packaged Wastewater Treatment system

The BioPAK® SBR (Sequential Batch Reactor) system provides an effective and economical solution for the treatment of various types of wastewaters. The fill-and-draw SBR process has been well proven over many years and is now further refined through the use of modern electronic probes and process controls. Consistently high removal rates are obtained allowing regulatory effluent discharge requirements to be reliably met. Our pre-packaged plug-and-play plant control room makes on-site plant deployment a simple and straightforward task. Ideally suited to remote installations where on-site works must be minimized



Key features

- Plug and play system
- Factory pre-tested
- Simple proven design – ideal for remote locations
- Automatic influent screening
- Aeration options to suit plant requirements including jet aeration, radial aeration and fine bubble diffusers
- Optional tertiary treatment including media filtration, UF membranes etc
- UV and/or Chlorine disinfection
- Effluent monitoring equipment
- Pre-programmed PLC system with HMI

- Remote monitoring and control for minimum operator supervision
- MBR Technologies maintains an experienced installation and construction crew dedicated to field-erected SBR projects.

Plant description

A BioPAK® SBR system will typically include the following elements:

- Automatic inlet screen
- Influent balance tank
- Bioreactor tank
- Effluent receiving tank
- Waste sludge receiving tank
- Control room with associated pumps, blower and valves.

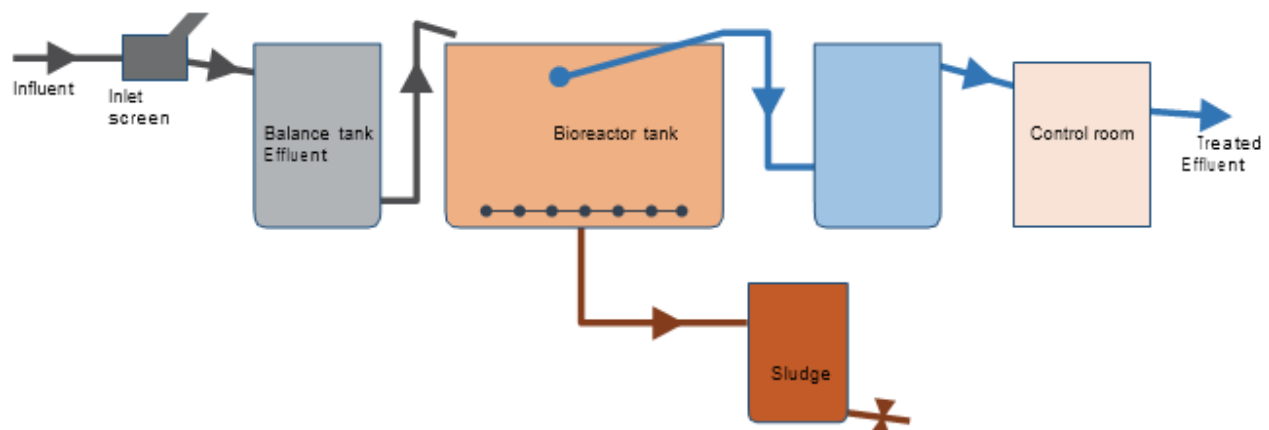
Applications

Municipal, Mining, Defence, Food & Beverage, Pulp & Paper, Petrochemical, Landfill/Leachate and Textile industries.



BioPAK® specifications

MBR Technologies model:	Unit	SBR-50	SBR-100	SBR-200	SBR-300	SBR-500
Rated flow	m ³ /day	50	100	200	300	500
Operating temperature	°C	5°C - 40°C	5°C - 40°C	5°C - 40°C	5°C - 40°C	5°C - 40°C
Power requirements	Phase/ kW	3 phase *	3 phase *	3 phase *	3 phase *	3 phase *
Typical MLSS	mg/L	2,000 - 8,000	2,000 - 8,000	2,000 - 8,000	2,000 - 8,000	2,000 - 8,000
Design Influent: BOD5	mg/L	300	300	300	300	300
COD	mg/L	600	600	600	600	600
TKN	mg/L	80	80	80	80	80
TSS	mg/L	450	450	450	450	450
TP	mg/L	15	15	15	15	15
pH		6.5 - 8.5	6.5 - 8.5	6.5 - 8.5	6.5 - 8.5	6.5 - 8.5
Expected effluent: BOD5	mg/L	< 10	< 10	< 10	< 10	< 10
N _{tot}	mg/L	< 20	< 20	< 20	< 20	< 20
TP	mg/L	< 10	< 10	< 10	< 10	< 10
TSS	mg/L	< 5	< 5	< 5	< 5	< 5
Turbidity	NTU	< 2	< 2	< 2	< 2	< 2
E.Coli	CFU/100mL	< 1	< 1	< 1	< 1	< 1
Inlet screening		YES	YES	YES	YES	YES
Screening aperture	mm	2.00	2.00	2.00	2.00	2.00
pH correction		Optional	Optional	Optional	Optional	Optional
Optional Tertiary treatment		Media/ Carbon	Media/ Carbon	Media/ Carbon	Media/ Carbon	Media/ Carbon
Aeration		Ejector or Diffusers	Ejector or Diffusers	Ejector or Diffusers	Ejector or Diffusers	Ejector or Diffusers
Control room		10' ISO **	20' ISO **	20' ISO **	20' ISO **	20' ISO **
Remote monitoring		YES	YES	YES	YES	YES
Auto waste off/sludge tanks		YES	YES	YES	YES	YES
Sludge filter press		Optional	Optional	Optional	Optional	Optional
Typical footprint	meters	10 x 10 ***	12 x 12 ***	15 x 15 ***	20 x 20 ***	30 x 30 ***



Disinfection

UV systems

Talk to us today about your UV disinfection requirement. We have UV systems available for Potable water, Effluent reuse, Sea water and other Industrial applications. Our UV range includes validated models with power consumptions from 40 watts to 12 kilo watts.



Chemical dosing systems

Chemical dosing systems available for all water and wastewater treatment applications. We also provide chemical storage tanks, bunding systems, safety showers, etc.



Monitoring

We offer a full range of reputable branded instruments and monitoring packages for measuring; Flow, Pressure, Dissolved Oxygen, TSS, Chlorine, Turbidity, pH, ORP, Conductivity and UV Intensity.





Dewatering Systems

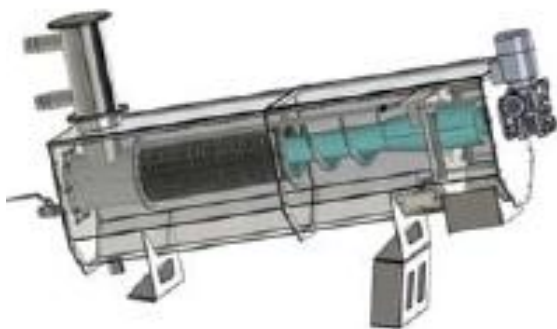
FP series – filter press

The fully automatic FP series filter press offers maximum dewatering and dry solids production. The filter press units feature a large filtration area within a compact foot print. They are available as a skidded package or even installed within a container. Filtration surface area's range from 1.4 – 310m².



ISP series - inclined sludge press

Our ISP series dewatering machines offer excellent sludge dryness and power consumption over other conventional dewatering systems. The inclined sludge press technology has significant advantages including low energy consumption, low wear and maintenance and high efficiency. The ISP units will handle inflow rates up to 8.0m³/hr.



Tanks

Our flat panel tanks are fully engineered to exceed the requirements for wind loading and water pressures in accordance with Australian Standards. Our tanks can be engineered to meet the requirements of structures in cyclonic areas.



Torpedo underground tanks

Manufactured from corrosion resistant materials these innovative products provide solutions for a vast range of applications. Torpedo tanks can be customised into many configurations; from raw water storage systems for residential properties through to a customised pumping, treatment and recycling system. The nature of fibreglass and polyethylene construction lets us design the exact fit for your project. Each system can be built in many different diameters, differing size configurations and with endless pipe, manhole and chamber options.

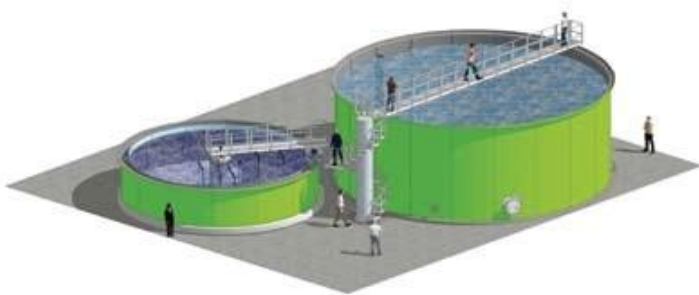


Fibreglass Tanks

Our Fibreglass panel tanks are an exceptionally good solution where installations involve corrosive liquids or harsh and corrosive environments such as near beach fronts or high intensity UV.

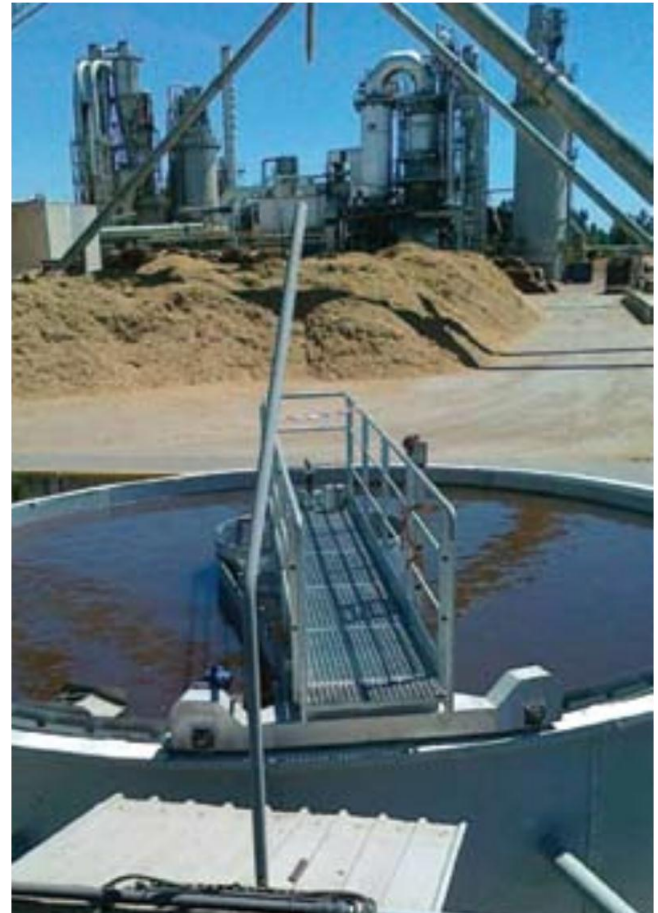
All Fibreglass panel tanks come supplied with a Gel coating similar to that used on marine equipment and boats. Standard volumes range from 14kL to 3.3ML.

Pipework, flanges and manholes can be custom fitted to suit customer requirements.



Clarifier Tanks

Our Fibreglass panel tanks can also be supplied with a decanter weir and bridge scraper system, all designed and engineered to meet the project specifications.












Floating Wetlands

Our Floating Treatment Media has proven itself a very efficient, low-cost way to enhance municipal wastewater treatment plants. You can retro-fit it to existing facilities with minimal cost or long-term overheads - or work the media into the design of new facilities with low operational costs.

It also offers a truly environmentally-sound and sustainable way of cleaning water - something increasingly important to councils and municipalities.



You can use it in any water environment requiring treatment, and it has a remarkably high effect on:

-  Anaerobic digestion
-  Odour mitigation
-  Nitrification processes
-  De-nitrification and polishing
-  Reduction in Bio-chemical oxygen demand
-  Removal of TSS
-  Reduction in faecal coliforms
-  Reduction in phosphorus
-  pH stabilisation

The biological processes occurring within the biomass of the Floating Treatment Media are the same as in activated sludge but have the added advantage of “Symbiosis” and increased microbial activity.



Contaminant	Removal Rates
BOD ₅	> 90%
Total suspended solids (TSS)	> 90%
Ammonia (NH ₄ N)	> 90%
Total nitrogen (TN)	> 90%
Total phosphorus (TP)	> 60%

Contaminant	Influent	Effluent	Removal Rates
BOD ₅ (g/m ³)	265	< 10	> 95%
Total suspended solids (TSS) (g/m ³)	265	< 10	> 95%
Ammonia (NH ₄ N) (g/m ³)	45	2 - 5	> 90%
Total nitrogen (TN) (g/m ³)	55	< 10	> 85%
Total phosphorus (TP) (g/m ³)	10	2 - 3	> 70%
F Coliforms (cfu/100ml)	7,000,000	≈ 100	

Filters

Mini basket filter

The Winnow™ MINI BASKET is compact stainless steel bodied filter module with a manually cleaned, basket type filter element. Typically used as an inlet screen for circulating pump protection, the Winnow™ MINI BASKET is supplied with a 316 stainless steel woven wire basket filter with a mesh rating of 3500µm. Simple proven design and durable stainless steel construction ensures many years of reliable operation.



Basket filter

The Winnow™ BASKET filter module features a heavy-duty stainless steel housing incorporating a manually cleaned, basket type filter element. The 316 stainless steel woven wire basket filter is available with mesh ratings from 110µm to 5000µm. Pressure gauges are fitted as standard and indicate when service is required. Simple proven design and durable stainless steel construction ensures many years of reliable operation.



Vortex separator

The Winnow™ VORTEX is a centrifugal accelerator separator particularly designed to treat water containing sands or suspended particles which have a higher specific gravity than the water. Often used as a pre-filtration stage before fine screening, the VORTEX will remove the bulk of larger particles and to reduce the load on the fine screen. The VORTEX is capable of removing up to 99% of sand and suspended solids larger than 75µm and up to 65% of particles larger than 50µm.



VTO filter

Winnow™ VTO is an automatic self-cleaning filter with a stainless steel housing for a long service life. VTO incorporates Winnows' rotating vacuum screen cleaning technology. A cleaning cycle, the vacuum head assembly rotated by a low voltage electric motor and moves along the length of screen to cover the entire screen surface area. The triple layer screen element is available with a range of mesh ratings between 25 and 810µm. Horizontal models (WVTM O) incorporate an extra coarse mesh pre-screening stage.



Big Matic filter

Winnow™ BIG MATIC is a heavy duty, automatic self-cleaning filter system desi for fine filtration and larger flow rates. Pleated polyester filtration element is available with filter ratings ranging between 1 and 53µm. During a cleaning cycle the BIG MATIC cartridges are rotated by a low voltage electric motor and are cleaned by a series of high pressure water jets. Filter housing is manufactured from corrosion resistant 316 grade stainless steel and is designed to be installed in tandem where large flows are required. The filter is supplied with automatic controls, valves, pressure gauges and support frame as standard equipment.



HYDRALINE SERIES

A fully automatic self-purging water filtration proven hydraulic turbine powered screen cleaning system. The self-contained design is driven by water inlet pressure only, making it idea for installation in the remotest locations where there is no power supply available and ultra-low maintenance and reliability is paramount.

Optional Electric Controllers are also available automatic cleaning intervals activated by b Pressure Differential and Time. Winnow™ WSM filter housings are manufactured from a dura Epoxy Coated Carbon Steel and the stainless steel screen is available with a range of filtration ratings between 100 and 1500 micron. Mod may be connected in tandem where increased capacity is required.



Filtration process

Water enters through the inlet connection and passes through the centre of the multilayer screen element. Water flows through the fine screen from the inside to outside and solids are retained on the screen surface. Filtered water flows out through the outlet connection. During filtration, drain purge valve remains shut.

Cleaning procedure

Filter cleaning cycle automatically starts when a pressure drop across the screen is identified. The hydraulic controller opens the drain purge valve and a relative negative pressure is created at the suction pad heads and within the hydraulic turbine causing the assembly to rotate the rotating suction heads spiral upwards and then downwards cleaning the entire screen area. Cleaning cycle is brief, flush water consumption is minimal and there is no interruption to the filtration flow during the cycle.



Technical data

MODEL	Inlet / Outlet	Flow	Min. Working Pressure	Max. Working Pressure	Screen Area	Max. Working Temp.
WSM 4"	4" BSP / DN100	140	2.5	10	4000	55
WSM 6"	6" BSP / DN150	140	2.5	10	4000	55
WSM 8"	8" BSP / DN200	400	2.5	10	8000	55

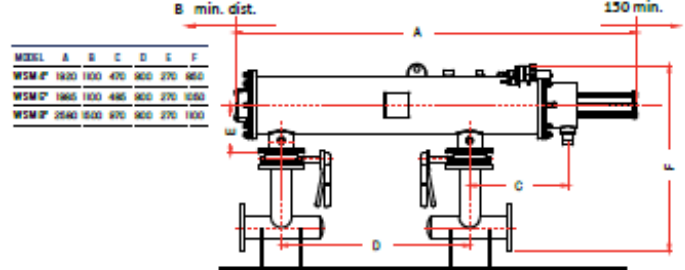
Flow rate based on 1.50 micron Screen.

Cleaning data

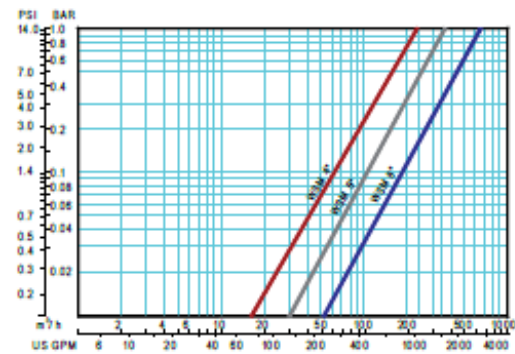
MODEL	Flush Valve	Flush Cycle Flow	Water Consumption	Min. Flow
WSM 4"	50mm / 2" S	10*	60	20
WSM 6"	50mm / 2" S	10*	60	20
WSM 8"	50mm / 2" S	10*	120	30

(*) Depending on working pressure.

Dimensions



Pressure loss



Custom Packages

Syngineering Water is part of the Syngineering Group of companies and it is the power of the Syngineering Group of companies that gives Syngineering Water a unique and powerful position in the market place. The Syngineering Group of companies combine to provide the engineering horse power, the project management determination, the construction resourcefulness, the operations eye for continuous improvement and the financial acumen behind Syngineering Water with mechanical, electrical, process, civil, management and structural engineers who work to deliver the right solution for the customer and long term partner.

As a result of the formidable team behind Syngineering Water covering every aspect of the project from concept through to compliance as we like to say at syngineering, we have developed a vast array of products to draw from in order to solve problems.



VSEP

How the VSEP Filtration System Operates

At the commencement of operation, the VSEP system is fed with a slurry and the concentrate valve is closed.

Permeate is produced and suspended solids in the feed are collected inside the VSEP filter pack.

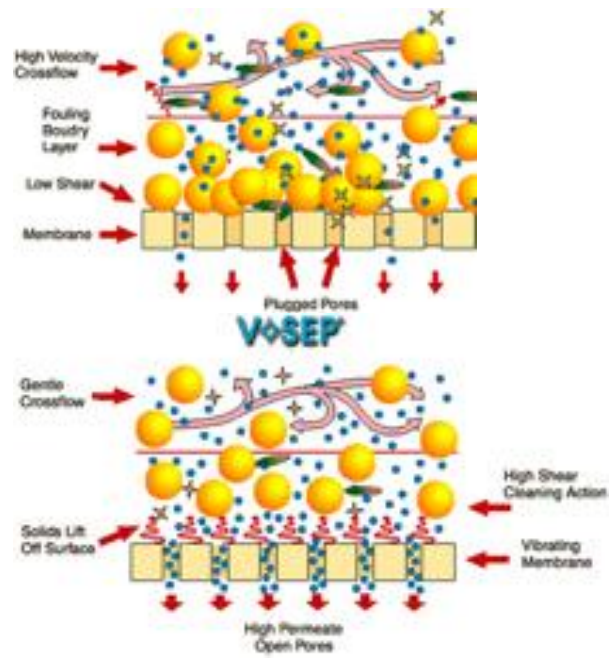
After a programmed time interval, valve one is opened to release the accumulated concentrated solids. The valve is then closed to allow the concentration of additional feed material. This cycle repeats indefinitely.

Membrane selection is the single most important factor that affects the quality of the separation. Other important factors that affect the system's performance are temperature, pressure, vibration amplitude, and residence time. All of these elements are optimized during testing and entered into the programmable logic controller (PLC) which controls the system.

The operating pressure is created by the feed pump. VSEP machines can routinely operate at pressures as high as 1,000 psig (68.95 BAR). While higher pressures often produce increased permeate flow rates, they also use more energy. Therefore, an operating pressure is used that optimizes the balance between flow rates and energy consumption.

In most cases, the filtration rate can be further improved by increasing the operating temperature. The temperature limit on a standard VSEP system is 79°C, significantly higher than competitive membrane technology. Even higher temperature constructions are also available.

The vibration amplitude and corresponding shear rate can also be varied which directly affects filtration rates. Shearing is produced by the torsion oscillation of the filter stack. Typically the stack oscillates with an amplitude of 1.9 to 3.2 cm peak to peak displacement at the rim of the stack. The oscillation frequency is approximately 53 Hz and produces a shear intensity of about 150,000 inverse seconds.



Feed residence time is set by the frequency of the opening and closing of the exit valve (valve one). The solids level in the feed increases as the feed material remains in the machine. Occasionally, a cleaner is added to the membrane stack and continued oscillation helps clean the membrane in minutes. This process can be automated and only consumes around 189 litres of cleaning solution thus reducing cleaner disposal problems inherent with other membrane systems.

Series i

Available in three sizes the original Series i remains a very popular product. All Series i systems are available fully automated and require very limited operator interaction.

Series i18

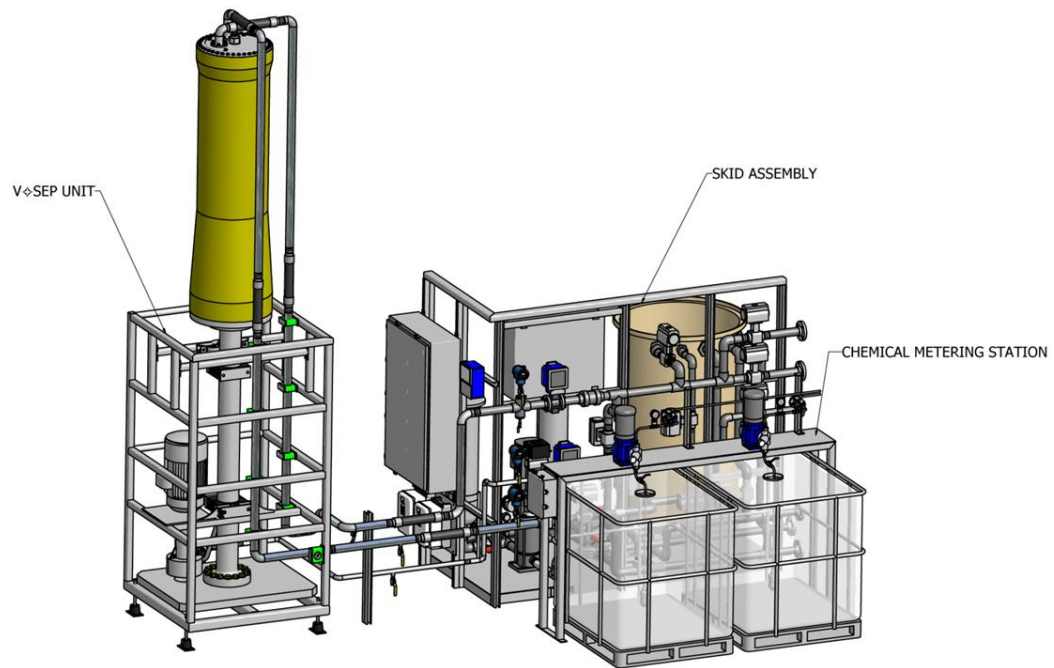
The smallest of the VSEP line, the i18 is perfectly suited for smaller flows. The available membrane area in the i18 filter pack ranges from 14m² to 27m².

Series i36

A perfect size for high solids applications and moderate flow rates, the i36 was the original workhorse of the Series i family. The available membrane area in the i36 filter pack ranges from 42m² to 56m².

Series i84

The most widely used VSEP with up to 130m² of membrane area in each filter pack, the i84 is the ideal module size to process larger flow rates. Many i84 system configurations are available – including use in tandem – to fit your needs.



Diatomics by AlgaEnviro

Managing Nutrients and Reducing Cyanobacteria in Water Treatment and Storage Systems

Managing nutrients in water is essential to ensure that microalgae and macrophyte plants do not become problematic in water treatment and water storage systems.

Letting nature manage these nutrients through the eco-system is by far the most cost-effective way of doing this. But too often people have assumed that 'Letting nature' manage the nutrients means 'do nothing'. Water bodies like the one below illustrate that to 'do nothing' won't work.



Natural and healthy ecosystems have a balance of all nutrients in them. When wastewater sites and farm storages get more nitrogen and phosphorus in them this balance is lost and then the problems start.

Diatomix is a non-toxic nano-silica nutrient mixture that has all the micronutrients required for re-establishing the balance. When restoring water ecosystem health or simply removing the problems associated with unhealthy water is needed then Diatomix is the answer.



Key Features

- Easy and safe to handle and use
- Fast acting –results can be in 24 hours
- Cost effective compared to filtration, weed removal, chemical treatments
- Creates stability and biological resilience within a system
- Optional automated, solar powered dosing system available

Applications

- Wastewater lagoons/wetlands
- Mine dams
- Farm dams and irrigation channels
- Aquaculture ponds
- Constructed water feature and wetland systems



Creating a healthy balance in water removes toxic blue-green algae issues, reduces floating weeds and bad odours. Setting up a Diatomix system is easy and makes long term economic sense for site managers and farmers.

Scraped Surface Heat Exchangers

Scraped surface evaporator reference
& outline information

Applications

Agricultural waste:

Pig manure, Cow manure, abattoirs, AD & Biogas plants: Digester feed concentration, Digestate, concentration,

Food industry waste:

Proteins, sugars, others

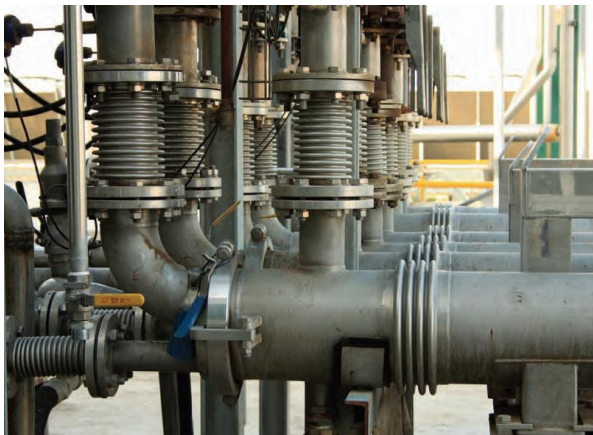
Industrial waste:

Pharmaceuticals, solvents, industrial waste water

Municipal waste water.

Leachate, Brines, others.

Evaporation is an effective way of reducing the impact of environmental waste. It is a thermal process where energy is invested to separate water volume. The evaporated water, when condensed, can be reused again. In environmental processing, the substance. Normal evaporators would have a limited operation time between stops for cleaning. HRS Heat Exchangers have overcome this problem by applying the scraped surface evaporator. Scraped surface means constant removal of fouling maintaining the evaporation capacity constant. The scraped surface evaporators can evaporate to very high levels of concentration.



Pilot Plants



Case Study 1 – Pig manure Evaporator

Feed : 2.5tonnes/hour
 Evaporation Capacity : 2tonnes/hour
 Nr Effects : 1
 Energy Source : CHP cooling water 85-70°C

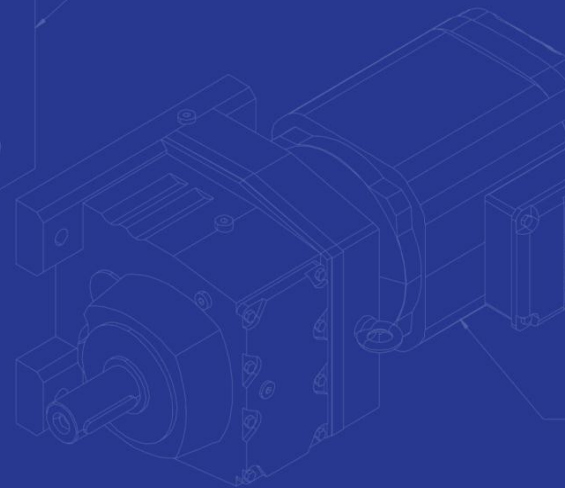
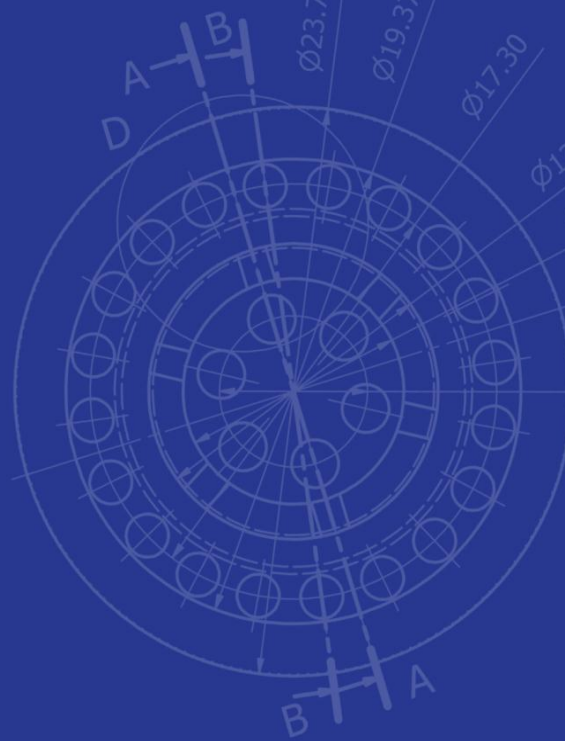
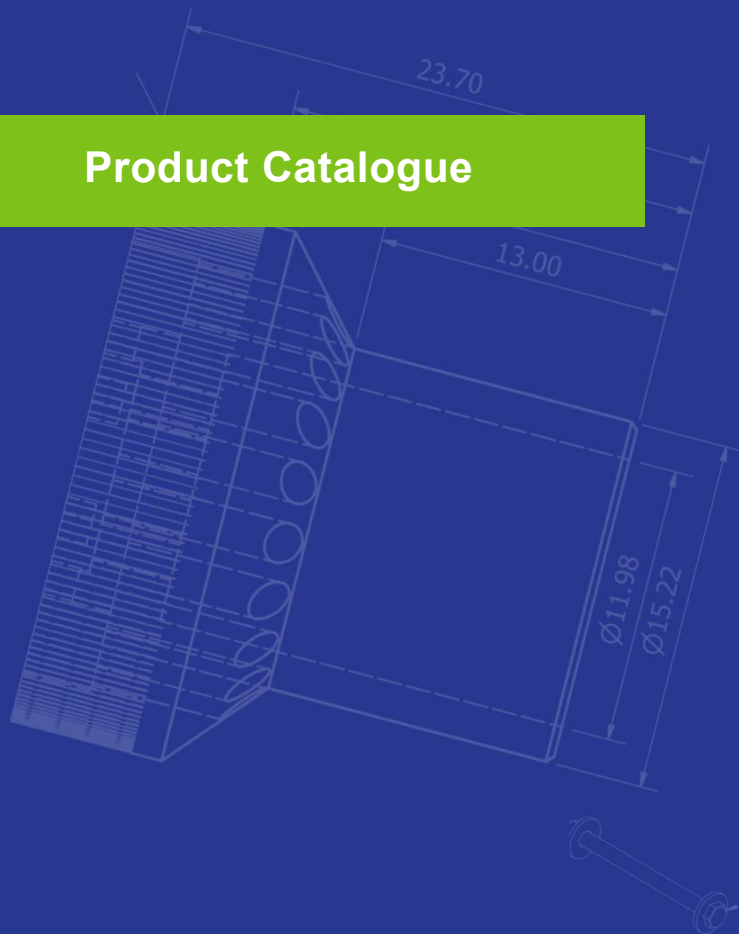


Case Study 2 – Brine Evaporator

Feed : 10m³/hour
 Evaporation Capacity : 7m³/hour
 Nr Effects : 2
 Energy Source : CHP exhaust gas



Product Catalogue



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