

*Transforming water
from
source to
resource*

Through Best in Class Membrane
Bio Reactor Treatment System



ABOUT US

Established in 2007, Om Sai Enterprise OSE, located in Vadodara, was incepted with a vision of transforming water from a mere source to resource that can be utilized across varied industries. In the span of half a decade, the company has risen to a level where it can boast of no competition in its field and has paved a way for itself on the path of progress. The core concept of OSE is Research & Development of new innovative technology, waste treatment and waste destruction, by developing of sustainable & cost effective technology for waste water treatment, recycling & reuse in comparison to conventional technology. OSE excels at clean & green technology. renewable energy projects like waste management, ETP & STP, and consultancy. OSE has developed expertise in designing special purpose renewable energy projects with all kinds of engineering inputs, customizable

according to the needs of the client. Backed by efficient companies in varied fields of environment projects execution, development, engineering, commencement and construction, OSE has managed to build an enviable list of projects and clientele and is planning to set its foot in the overseas market. The company also provides technology transfer services. The secret of OSE's success is its human resource asset that drives the business. The team at OSE includes one of the best & qualified environment consultant & EPC contractor companies along with the team that is technically sound and efficient, which believes in keeping updated with the latest trends and combines passion and dedication with experience from all walks of life, resulting into extraordinary outcomes.

ABOUT OSE- MBR STP



OSE-MBR STP are Membrane Bio Reactor based Sewage treatment and recycling plants. It is indigenously developed for meeting stringent treated water norms for sewage water and various other ETP's. It works on principle of biological digestion followed by specially designed submerged hollow fiber membrane filtration. Hollow fiber membranes have pore size of 0.1 – 0.06 micron which ensures removal of pathogens and bacteria in treated water. OSE-MBR STP is a combination of membranes, pumps and other electrical equipment's which makes itself unique in operation and having hassle free maintenance.

ABOUT MEMBRANE BIO REACTOR

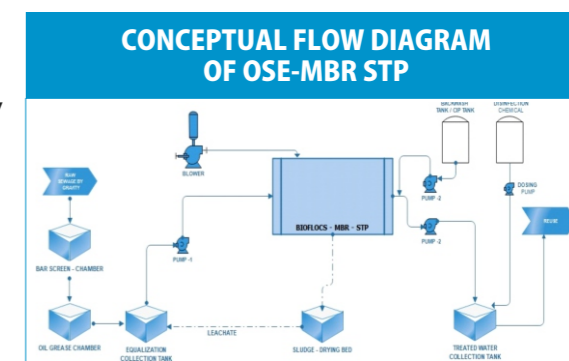
A membrane bioreactor connects membrane filtration to a biological active sludge system. The membranes thus replace the sedimentation basin in classic biological purification and help to separate the sludge from the effluent. This helps to ensure that all floating matter is retained, whereby sedimentation is no longer a restrictive factor for sludge concentration. A membrane reactor is thus able to process significantly higher sludge concentrations and lower reactor volumes, compared to conventional systems.

The membrane can either be placed next to the biological basin (= external or separate system), or in the basin (= internal or submerged). External systems involve continuous cross-flow circulation along the membranes. Both tubular and flat plate membranes are used to realise this. An internal system involves the effluent being extracted from the active sludge using

under-pressure. This normally involves the use of hollow fibres or flat plate membranes

BENEFITS OF MEMBRANE BIO REACTOR

- Occupies less space than conventional technology
- Being a combination of secondary and tertiary gives more better output in single step
- Better treated water quality results
- Consistent treated water quality result
- Lesser installation and commissioning time
- Completely automatic system allows less dependency on manpower
- MBR can handle high amount of MLSS than any other technology
- Removes pathogens, E-coli and other bacteria's





A Sustainable Innovative Membrane Bio Reactor Plant

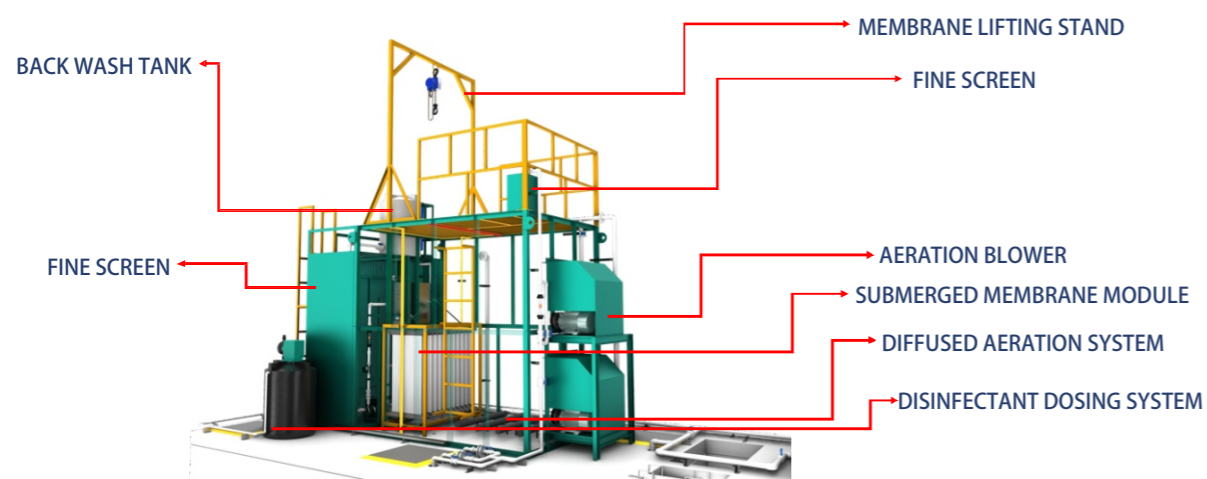


Sewage Treatment Plant

An Package Sewage Treatment and Recycling System For

- Industries
- Malls & It Parks
- Hotels & Resorts
- Apartments And Community

COMPONENTS OF SYSTEM



OSE - MBR MEMBRANE MODULES



OSE - MBR DUAL SIDED HIGHER CAPACITY MBR MODULES



SINGLE SIDED - SMALL CAPACITY MBR MODULES



OSE - MBR



ONSITE IMAGES OF ACTUAL INSTALLATIONS

TECHNICAL INFORMATION ON OSE MBR-MEMBRANE

PARAMETER	DESCRIPTION
MOC OF FIBER	REINFORCED PVDF
SQM AVAILABLE (SQM / MODULE)	10/20/30 SQM- AS PER REQUIREMENT
FILTRATION MODE	OUT TO IN
PH RANGE	2 - 12
TEMPERATURE RESISTANCE	Upto 40 deg C
APPLICATIONS	STP / ETP / CLEAN WATER / FILTRATION
BACKWASHABLE	YES
CIP	POSSIBLE WITH HYPO, CITRIC, HCL - As per recommendation of supplier
MLSS handling capacity	4000 - 10000 ppm
Diameter of fibers	0.9 / 2.1 - ID / OD



OSE MBR - STP
THE MOST COMPACT, MODULAR & COMPLETELY AUTOMATIC PACKAGED & CONTAINERISED SEWAGE RECYCLING SYSTEMS



TECHNOLOGY COMPARISON: OSE- MEMBRANE BIO REACTOR V/S ATTACHED GROWTH BIOFILM PROCESS (MBBR/FRB/SAFF ETC)



Parameter	OSE – Membrane Bio reactor (MBR)	Conventional Attached Growth Biofilm Process (MBBR /FRB/SAFF etc.)
Output water quality	<ul style="list-style-type: none"> For reuse application MBR based treatment approach give better result (lower COD/BOD) because solid liquid separation is based on fine pore submicron membrane. Nutrient removal is also better or at par in the MBR reactor due to higher MLSS. 	<ul style="list-style-type: none"> For reuse application MBBR based approach give limited result as the final solid liquid separation is based on gravity. If MBR equivalent output is required then conventional process would require extensive tertiary treatment and even Ultra Filtration of the treated water.
Nutrient removal	<ul style="list-style-type: none"> MBR systems due to their higher MLSS operation create a unique ecosystem which is very efficient in removal of nutrients likes nitrogen and phosphorus present in sewage water. 	<ul style="list-style-type: none"> If good nutrient removal is desired in conventional technology then special design is required as these technology are very in- efficient in nutrient removal. The advantage of MBR over conventional technology in nutrient removal has been verified by several studies.
Treatment stages	<ul style="list-style-type: none"> MBR based approach is only single composite treatment stage. Single treatment stage makes plant operation easier. 	<ul style="list-style-type: none"> There are generally three treatment stage: Primary, Secondary and Tertiary. Three stages of treatment complicates plant operation.
Foot print	<ul style="list-style-type: none"> MBR plant have smallest foot print. Because the treatment stages are composite in nature the plants are compact and their design highly flexible. Small foot print plant makes design of package plant very easy 	<ul style="list-style-type: none"> Conventional plant occupy nearly double the space that of MBR. The plant design is inflexible in nature. Design of package plant is difficult due to bulky nature of plant.
Sludge quantity	<ul style="list-style-type: none"> As MBR operate on higher MLSS content, the sludge generation is lower than conventional plants. Higher MLSS operation creates unique environment wherein the plants can be if desired operated in net zero sludge mode. Lower plant foot print helps plan sludge management well 	<ul style="list-style-type: none"> These technologies operate on a limited MLSS values which is 1/2 to 2/3 less than MBR. Lower MLSS leads to higher sludge generation. As the plant foot print is higher, there is limited space available for sludge handling.
Ease of Startup	<ul style="list-style-type: none"> Membrane based system have lower startup and stabilization time because go nearly 100% retention of bacterial mass within the bioreactor. 	<ul style="list-style-type: none"> Conventional Biofilms based process required longer duration for startup. They also require very close monitoring of the process and regular intervention.
Ease of operation	<ul style="list-style-type: none"> OSE MBR system are by default fully automatic system requiring minimal manual intervention. Pump operations, Membrane backwashing, air purging, sludge wasting and in-situ CIP happen in auto mode. 	<ul style="list-style-type: none"> Manufacturers of conventional plant generally charge extra for a fully automatic plant.
Scope of Future expansion	<ul style="list-style-type: none"> Treatment capacity of OSE MBR plants can be increased to accommodate increased flow of wastewater. Higher MLSS based operation gives good results at even lower HRT (Hydraulic Residence Time) 	<ul style="list-style-type: none"> Plants based on these technologies cannot be expanded as the HRT are higher and thus it cannot be increased easily.
Capital cost	<ul style="list-style-type: none"> Capital cost of MBR plants were higher in past due to higher membrane cost. But with reduction in membrane price during past few years, capital cost of packaged MBR plants have come at par with conventional systems 	<ul style="list-style-type: none"> Conventional plant has perceived advantage of lower cost, but when complete cost of plant ownership which includes civil and mechanical equipment cost is compared with MBR plant than its at par with MBR based system.

Advantages of the MBR Technology over conventional Technologies used in Sewage Treatment

Description	Activated Sludge Process	MBBR - Moving Bed Bioreactor	OSE- BIOZAP - MBR
Process Type	Suspended Growth	Attached Growth	Biological + Filtration
Area Footprint	Maximum	Moderate	Minimal
Treatment Efficiency (COD, BOD, TSS)	80- 90 % Reduction	90-95 % Reduction	97-99 % Reduction
Water quality & Consistency	Low quality & Consistency	Moderate quality & consistency	Excellent quality with High consistency
Required Level Of Manual Intervention	Medium	High	Low
Electro - Mechanical & Civil cost	High	High	Low-Moderate
Maintenance	Difficult	Difficult	Easy
Water Recovery	80-90 %	> 90 %	> 95 %
Enhancement of Treatment capacity	Low chances	Enhances by 5-10 %	Enhances by > 3 X
Sludge handling	Require Periodic Sludge Wasting Intern Frequent Sludge Handling Equipment Usage	Require Periodic Sludge Wasting Intern Frequent Sludge Handling Equipment Usage	Highly Stabilized Sludge Reduces Sludge Handling Equipment Footprint
Electrical Consumption	Medium	Medium	Moderate





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