

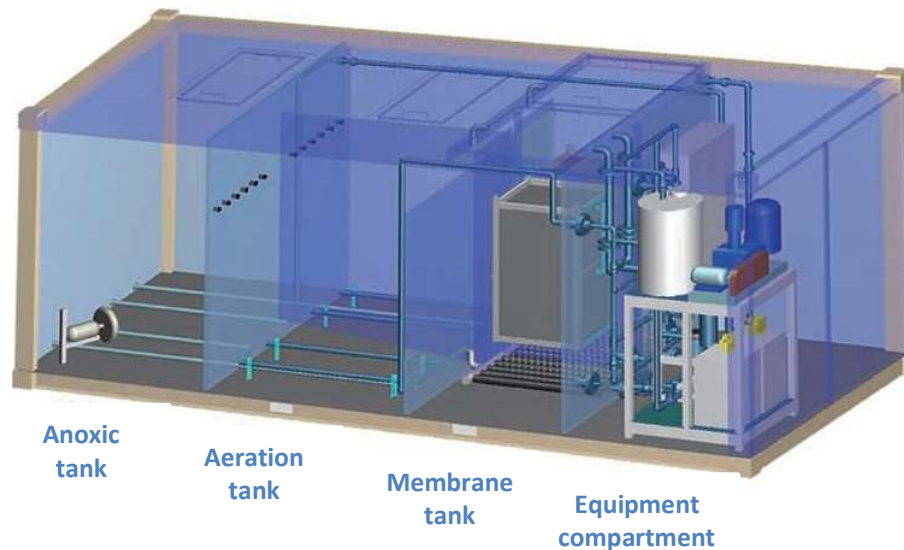


NANYANG TECHNOLOGY DEVELOPMENT PTE LTD

INTEGRATED MEMBRANE BIOREACTOR (MBR)

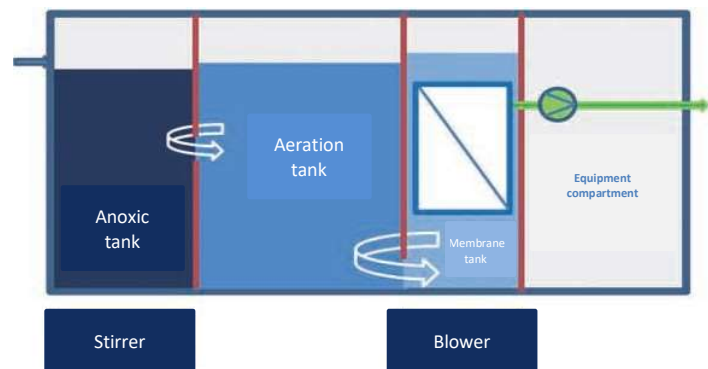


Integrated MBR system is easy to be transported and installed, which makes it convenient to be used for decentralized wastewater treatment plants. It produces effluent with good quality, enabling water recycling and ensuring environmental compliance.



Compare to conventional activated sludge process, the integrated MBR has lower operating costs due to the following reasons:

- Membrane flushing and scouring are in both direction, which reduces membrane scouring aeration energy by 50%
- Coupling of the membrane tank and the aeration tank reduces the aeration requirement in aeration tank
- Unique design of air scouring system in MBR tank enables mixed liquor flow in the anoxic, aeration and MBR tanks
- Backwash pump could be eliminated if flat-sheet membrane modules are used



Compared to conventional activated sludge process, integrated MBR has lower CAPEX due to the following reasons:

- Smaller aeration tank
- Elimination of settling tank and filter
- Elimination of sludge recirculation pump

Key Equipment of Integrated MBR



Equipment compartment

Integrated MBR has fully automated equipment and online sensors, which improves plant's reliability without operation personals. Operating data can be uploaded to remote computer, which enables remote monitoring and control.

Integrated MBR will be containerized if it is to be installed above ground.



Containerized integrated MBR for above-ground installation



Integrated biological system for underground installation



Equipment compartment for underground installation

Integrated MBR will be separated into underground biological system and above-ground equipment compartment for cold-climate areas to prevent freezing in the winter.

Applications of Integrated MBR

Isolated village

New development

Hospital
Hotel
Ship

Small and medium factories

Isolated power plants

Dimension of above-ground installations

Model number	Capacity (m ³ /d)	Dimension (m) L x W x H	Power (kw)	Weight (t)	Weight during operation (t)
LE-MBR-20	20	4.5x2.5x2.6	0.92	5.5	25
LE-MBR-50	50	6. x2.5x2.6	0.92	7.2	35
LE-MBR-75	75	7.7x2.5x2.6	1.3	8.8	37
LE-MBR-100	100	9.2x2.5x2.6	2.24	10	53
LE-MBR-150	150	12.5x2.5x2.6	2.24	13	67
LE-MBR-200	200	12.5x2.5x2.9	3.32	16	75
LE-MBR-250	250	13.8x2.5x2.9	3.32	18	87

Dimension of underground installations

Model number	Capacity (m ³ /d)	Dimension (m) φ x L	Power (kw)	Weight (t)	Weight during operation (t)
LE-MBR-20	20	2.5x4.5	0.92	6	35
LE-MBR-50	50	2.5x6.0	0.92	7.5	43
LE-MBR-75	75	2.5x8.0	1.3	9	55
LE-MBR-100	100	2.5x10	2.24	12	67
LE-MBR-150	150	3.2x8.0	2.24	14	90
LE-MBR-200	200	3.2x10	3.67	18	110
LE-MBR-250	250	3.2x12	3.67	20	120

Dimensions could be customized



NANYANG TECH



Steve Li
TEL: +65 9138 0201
EMAIL: Steve.Li@nanyangtech.com.sg



Francis Ooi
TEL: +65 8298 0725
EMAIL: Francis.Ooi@nanyangtech.com.sg



Yue Xiaodi
TEL: +65 9788 4765
EMAIL: Yue.Xiaodi@nanyangtech.com.sg