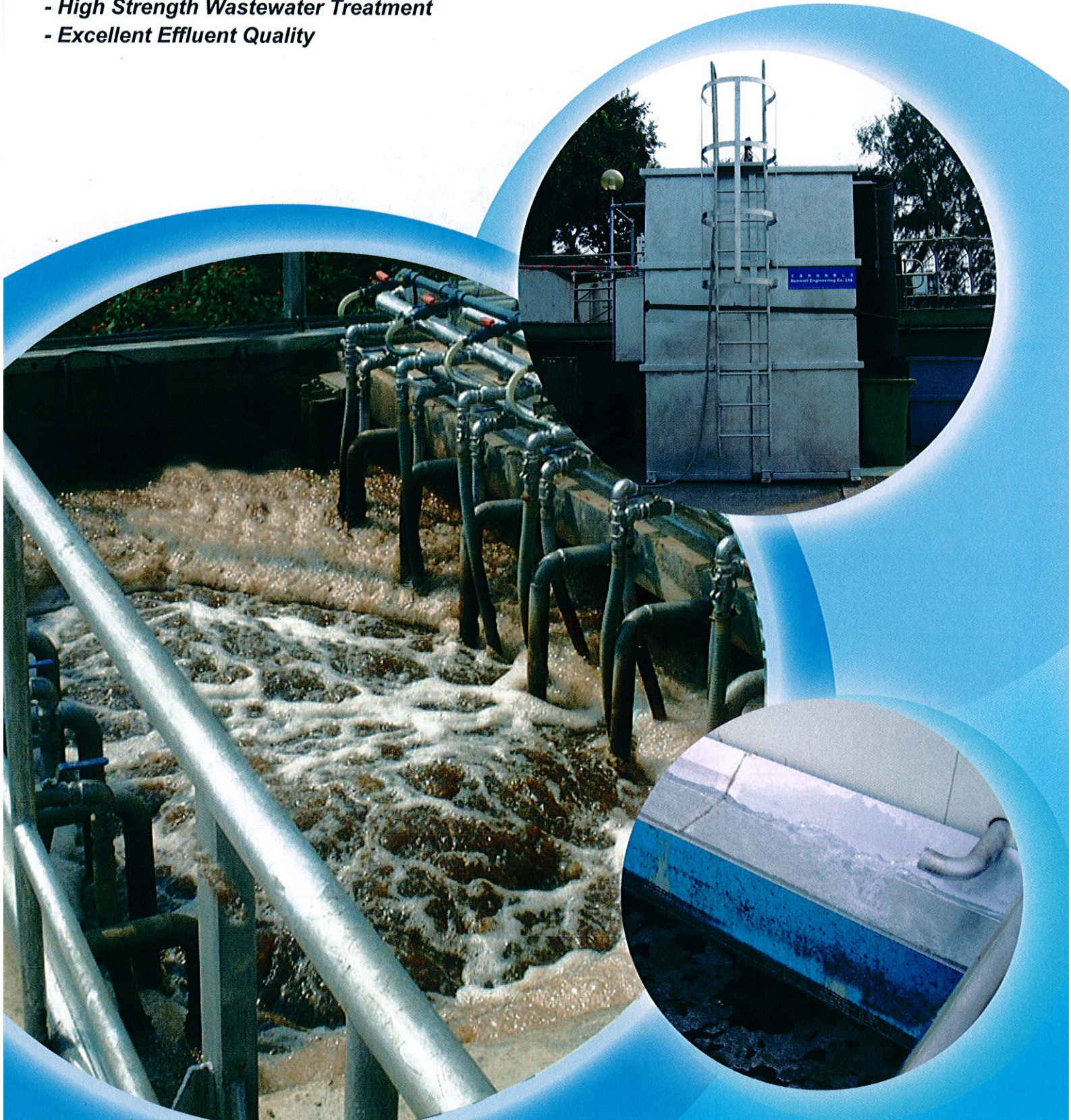
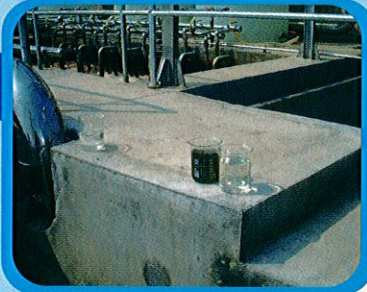


MBR

Membrane Bio-Reactor

- *Wastewater Reuse*
- *High Strength Wastewater Treatment*
- *Excellent Effluent Quality*





In conventional activated sludge processes, separation of treated water from the sludge is mainly achieved by sedimentation in secondary clarification tank. This requires a considerable amount of space and capital cost, and separation efficiency is low.

Using membrane to replace the secondary clarification tank, suspended solids can be completely removed from treated water, resulting in a high effluent quality. It not only concentrates slow-growing bacteria, but also retains large molecular organic compounds in reactor, thereby increasing contact time with the sludge. Thus, removal rate of COD, BOD, nitrogen and phosphorus will be greatly increased.



Advantages of MBR

- 1 High effluent quality**
 - Permeate - free of suspended solids
- 2 Small footprint, elimination of secondary clarification tank**
 - Only half of the area of conventional activated sludge process is required, and capital cost is reduced
 - Solve the problem of poor sedimentation in conventional activated sludge process; especially for winter
- 3 Long solid retention time, easy management**
 - Sludge wasting volume is greatly reduced
- 4 High biomass concentration and treatment efficiency**
 - Operate at biomass concentration of 10,000 - 20,000 mg/L, COD removal and denitrification occur simultaneously
- 5 Easy to install in the existing aeration tank to become a MBR system**
- 6 Easy for operation & maintenance**
- 7 Greatly reduce the volume of aeration tank**
- 8 Reduce fouling and increase water flux**

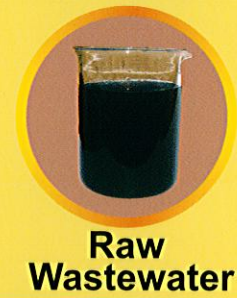
Case Studies

Wastewater Source	Parameters	Influent	Effluent	Removal Rate (%)
Food Processing	BOD (mg/L)	1590	1	99.9
	COD _{Cr} (mg/L)	2600	7	99.0
	SS/ (mg/L)	380	<1	100
Sauce Production	BOD (mg/L)	3630	5	99.9
	SS/ (mg/L)	380	<1	100
Landfill Leachate	COD _{Cr} (mg/L)	~10,000	60	99.4
	SS/ (mg/L)	<500	<1	100
Grey Water Recycling	BOD (mg/L)	<=200	<=10	95.0
	SS/ (mg/L)	<=200	< 1	100

Uses of MBR

- 1 Domestic wastewater treatment / Grey water recycling**
High treatment efficiency, high effluent quality
- 2 Industrial wastewater treatment**
Suitable for landfill leachate, high BOD food processing wastewater, livestock wastewater, chemical wastewater and pulp and paper wastewater
- 3 Water reuse or recycling**
Direct reuse or purified with reverse osmosis

MBR Membrane Bio-Reactor



Raw Wastewater



Screen / Grit Removal



Anoxic



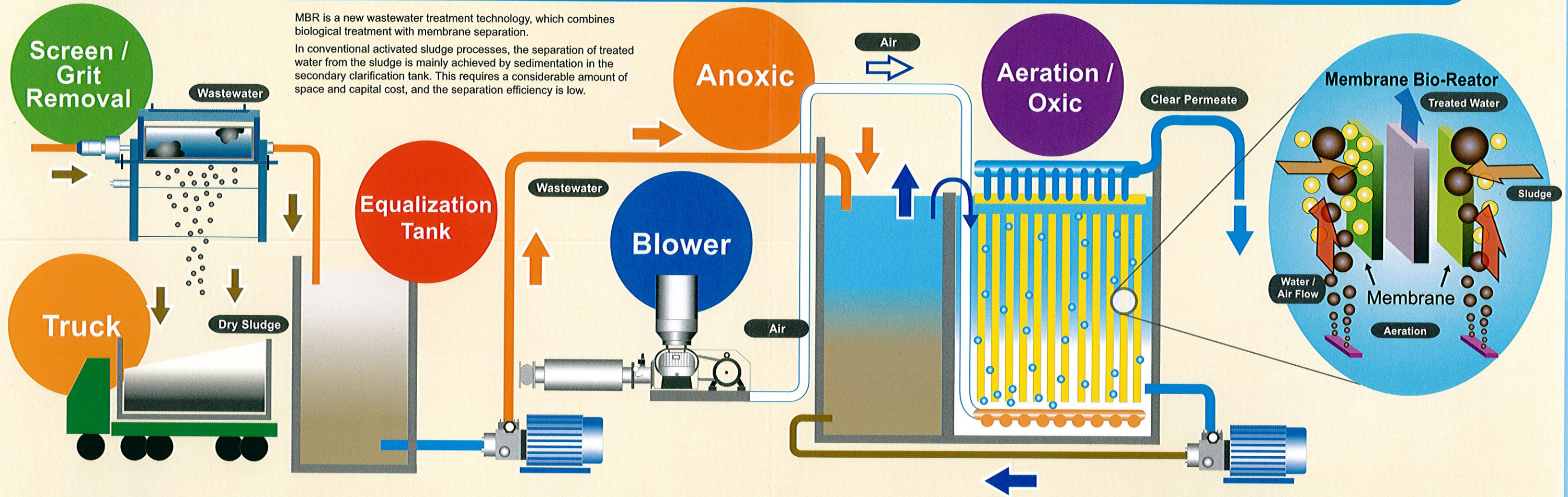
Aeration / Oxic



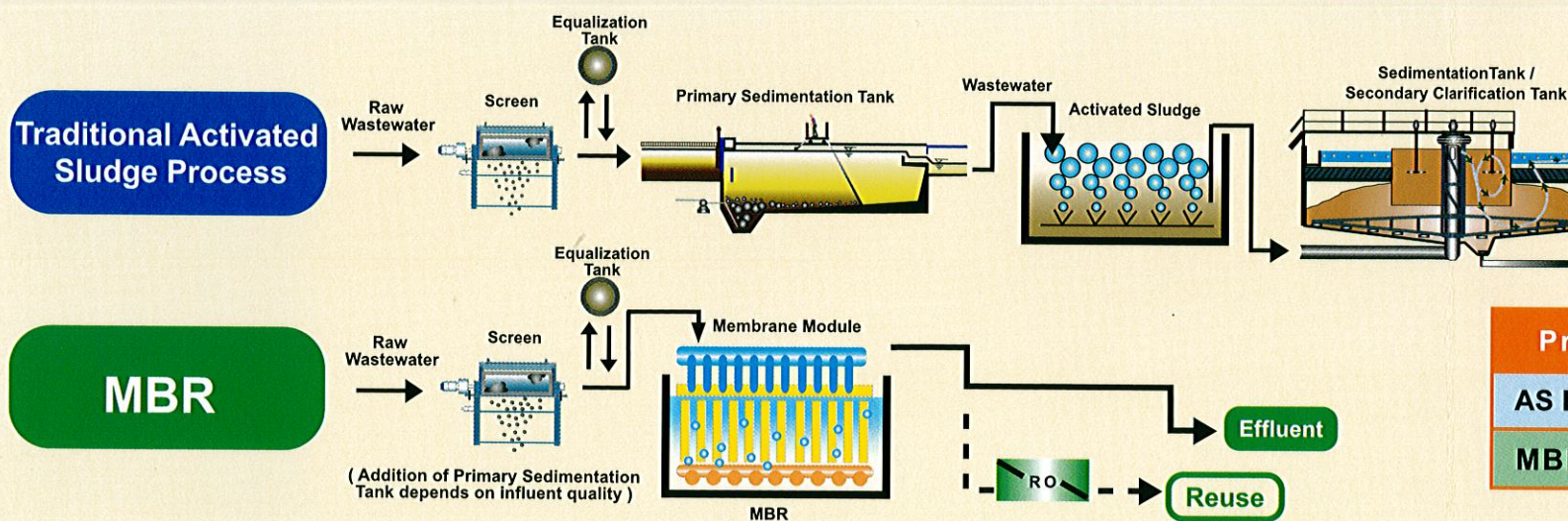
Dewatered Sludge



Clear Permeate



MBR and Traditional Activated Sludge Process Comparison



Comparison between MBR & Traditional AS Process

Process	Performance	Maintenance	Sludge Conc.	Energy Consumption	Space Saving	Bio Mass
AS Process	Fair	Fair	Low	High	Poor	Low
MBR	Excellent	Easy	High	Low	Good	High