

# Application Example of MBR

## Zhengzhou Dennis Commercial Plaza Grey-water Project

Located in Zhengzhou, Henan Province of China, Zhengzhou Dennis Commercial Plaza is a large scale commercial shopping center combined by Department stores, Hypermarkets, Convenience stores, Hotels and Logistics centers. All this time, it have discharged the waste water directly to the municipal pipe.

In 2015, to respond to the call of water pollution control and water resources development national policy, realize the Urban Wastewater Resource Utilization, Zhengzhou Dennis Commercial Plaza decide to build a water treatment project to reuse of recycled water.

### Project situation:

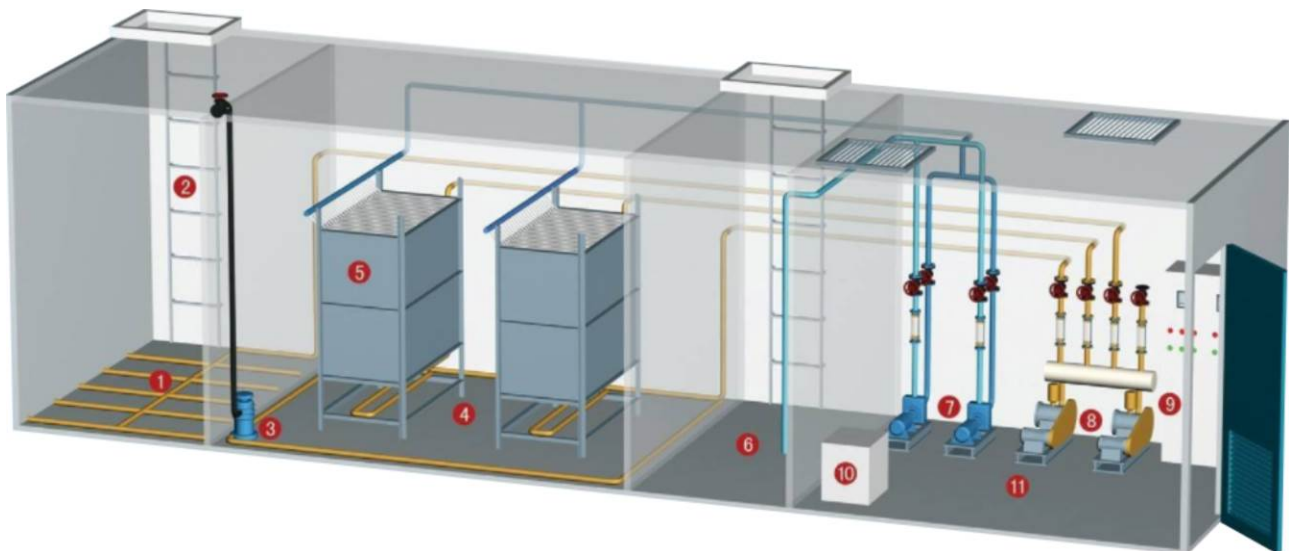
**Raw water source:** Waste water from hotel toilet and bath.

**Water quantity:** 720m<sup>3</sup>/day.

**Treatment requirement:** To reach the *Miscellaneous Urban Water Quality Standard GB/T18920-2002*.

Based on the project situation and outlet water requirement, Dennis Commercial Plaza chooses the integrated MBR treatment system LS720, the main technology is MBR membrane bioreactor which has simple process flow, easy for operation and management, operation stable and have good treatment effect.

### Process flow diagram



### Basic Components

- 1.Pre-Treatment Tank    2.Inner Ladder    3.Sludge Pump    4.Reaction Tank    5.MBR Membrane Module  
6.Recycled Tank    7.Lift Pump    8.Air Distributor    9.PLC System    10.Disinfection Device    11.Control Room

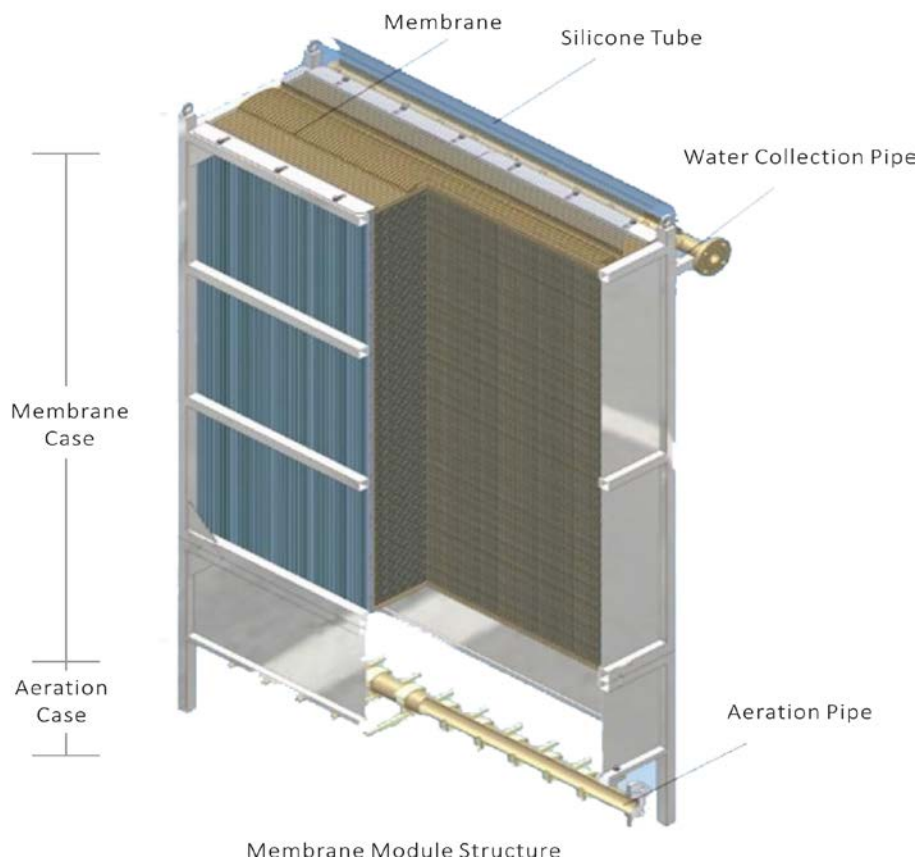
### Technical data of LS720

Item		LS720
Volume of anoxic tank (m <sup>3</sup> )		90(concrete structure)
Volume of MBR tank (m <sup>3</sup> )		150
Volume of sludge tank (m <sup>3</sup> )		50(concrete structure)
Volume of fresh water disinfection tank (m <sup>3</sup> )		30
φ 150(pp) float ball packing(m <sup>3</sup> ) of anoxic tank		27
Air blower	Air capacity (m <sup>3</sup> /min)	11.75
	Air pressure (kPa)	39.2
	Power (Kw)	15
	Rotation speed (rpm)	860
Lift pump	Flow rate (m <sup>3</sup> /h)	40
	Head (m)	16
	Power (Kw)	3
Suction pump	Flow rate (m <sup>3</sup> /h)	40
	Head (m)	22
	Power (Kw)	5.5
Power of GF600mechanical bar screen (Kw)		1.1
Unit weight of equipment (kg)		23100
Total weight of equipment (kg)		23570
Operating weight (kg)		181700
Total Installed power of the system (Kw)		54.85
Operating power (Kw)		26.5
Floor area of the system (m <sup>2</sup> )		335

Based on the water quantity, volume of MBR tank, etc. Dennis Commercial Plaza chooses 18 unit of RF-100-100 PVDF flat sheet membrane module. Compared with traditional curtain membrane system, the water treatment products can adapt higher sludge concentration ( 6000-15000mg/L), and not

easy to get clay up and reduce the effective membrane area, the outlet water is stable, have longer service life, and easy to operation and replace.

### Membrane module structure



### Technical data of RF-100-100

Item	RF-100-100
Effective area(m <sup>2</sup> )	100
Size: L*W*H(m)	1.7*0.7*2.0
Numbers of membrane(pcs)	100
Production rate(m <sup>3</sup> /day)	40-70
Weight(kg)	480
Material of stand	304 stainless steel
Material of aerator pipe	ABS and UPVC
Material of collector pipe	ABS

### Water Quality Data

Item	Raw water	Standard requirement	Outlet water quality
Turbidity (NTU)	60	≤5	≤1

SS (mg/L)	1500	$\leq 1000$	$\leq 1$
BOD <sub>5</sub> (mg/L)	250	$\leq 10$	$\leq 8$
N-NH <sub>3</sub> (mg/L)	40	$\leq 10$	$\leq 5$

Compared with traditional biological contact oxidation, the membrane bioreactor technology saved the land space of secondary sedimentation tank and aerobic treatment tank, greatly reduced the area of structure, suit for the reconstruction of Dennis Commercial Plaza.

And the outlet water quality suit the Miscellaneous Urban Water Quality Standard requirement, the water can be used for flush the toilet, flush the garage road, landscape irrigation, etc.

After installed the membrane bioreactor system, it can reduce about 1500USD water charges for Dennis Commercial Plaza.

### Pictures of Zhengzhou Dennis Commercial Plaza Water Treatment System

