

# CASE STUDY

RO | UF | MBR |

Pharmaceutical  
Lanzhou, China



## Toray MBR Modules Retrofit Conventional Activated Sludge Treatment System at a Bio-pharmaceutical Facility in China

### PROJECT BACKGROUND

In Lanzhou, China, an established biopharmaceutical company needed to upgrade its existing conventional activated sludge wastewater treatment system. With growing production demands and tightening of industry effluent discharge standards, the 2,000 m<sup>3</sup>/day treatment scheme could no longer handle increased wastewater flow and meet new discharge requirements. The plant was limited with space to add new equipment and had to look at a retrofit option with increased production capacity, high-quality effluent, all within the same system footprint.

### PRODUCT SELECTION

The end-user conducted extensive studies and field surveys for multiple membrane bioreactor (MBR) suppliers. In China, Toray's flat-sheet MBR technology successfully treated challenging wastewater feeds at other pharmaceutical sites (end user's sister facility in Sichuan) and a coal liquefaction site in Inner Mongolia.

Furthermore, Toray's MBR uses PVDF flat-sheet membranes with a nominal pore size of 0.08 μm. These pores are uniformly sized and densely distributed along the membrane surface, producing high permeability, durability against fouling and chemical cleaning, and overall simplified operation leading to reduced consumption of energy and labor associated with maintenance. The end-user selected Toray based on these product advantages, proven references, and expert technical and aftermarket support.



Figure 1: Tanks installed with Toray MBR modules at Lanzhou's bio-pharmaceutical facility

Table 1 — Quick Facts

Flow capacity	5,000 m <sup>3</sup> /d	
Membrane module	TMR140-400DW	
Start-up	October 2019	
Plant configuration	2 trains each with 12 modules	
Influent water quality	Suspended solids	<170 mg/L
	COD	<500 mg/L
	BOD	<200 mg/L
	NH <sub>3</sub> -N	<40 mg/L
Effluent water quality	Oil & Grease	<12 mg/L
	COD	<20 mg/L
	Turbidity	<1 NTU

Figure 2: New industrial wastewater treatment system design

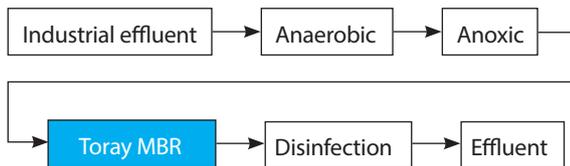




Figure 3: Installation of Toray MBR modules

#### SUMMARY

Toray's MBR modules ensure that the wastewater can meet increased production wastewater flow, exceed design expectations in effluent quality and future expansion plans. The newly integrated wastewater treatment system uses the same system footprint as the previous conventional activated sludge system. It now produces more than double the total capacity at 5,000 m<sup>3</sup>/day compared to the previous system capacity of 2,000 m<sup>3</sup>/day. This facility is known to be one of the largest MBR systems for treating pharmaceutical wastewater in China.

TORAY INDUSTRIES, INC.

Head Office: Nihonbashi Mitsui Tower 24<sup>th</sup> Floor, 1-1, Nihonbashi-Muromachi 2 chome, Chuo-ku, Tokyo, 103-8666, JAPAN

 [www.water.toray](http://www.water.toray)

 +81 3 3245-4542

 LinkedIn

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