

CASE STUDY

RO | UF | MBR | CHEMICALS

Wastewater Reuse
Nantong, China



Toray's UF and RO System Solves Strict Discharge Standards for Dyeing Wastewater

PROJECT OVERVIEW

Toray Sakai Weaving & Dyeing (Nantong) Co., Ltd. (TSD) in China is a leading factory where focusing on chemical fiber weaving and dyeing. At the site, 13,000 m³ of wastewater is generated per day. 8,200 m³/d water is discharged after treated by biological-chemical treatment. 4,800 m³/d is treated to COD ≤ 70 mg/L before being sent directly to the downstream wastewater reuse system using membrane technology. Through advanced treatment using Toray UF (HFU-2020AN) and Toray RO (TML20D-400), high-quality reclaimed water totaling 3,600 m³ is successfully produced.

BACKGROUND

The pressure of water treatment membrane facility installation comes from both government requirements and customer's requirements on water recovery.

In the Nantong Industrial Zone in China, wastewater discharge is subject to strict regulations, including BOD ≤ 50 mg/L, COD_{Cr} ≤ 200 mg/L, TSS ≤ 50 mg/L, Sb < 0.1 mg/L, TN < 30 mg/L, TP < 1.5 mg/L, and pH between 6 and 9. In addition, Weaving and dyeing industry facilities are required to recycle more than 40% of their wastewater. (* > 45% since 2025)

It was therefore essential to select a highly reliable and efficient treatment process capable of meeting all of these requirements. Due to the high reputation of Toray's brand and quality, and demonstration project in the industry, TSD decided to choose Toray's membrane.

PROJECT INFORMATION

- Customer: Toray Sakai Weaving & Dyeing (Nantong) Co., Ltd.
- Engineering: TSD
- Location: Nantong, China
- Capacity: 3,600 m³/d
- Operational Start: 2015
- Products: Toray UF (HFU-2020AN) /Toray RO (TML20D-400)



Figure 1: Toray Sakai Weaving & Dyeing (Nantong) Co., LTD



↑ Figure 2: Toray UF Unit (upper) and Toray RO Unit (lower)



← Figure 3: Dyed Products

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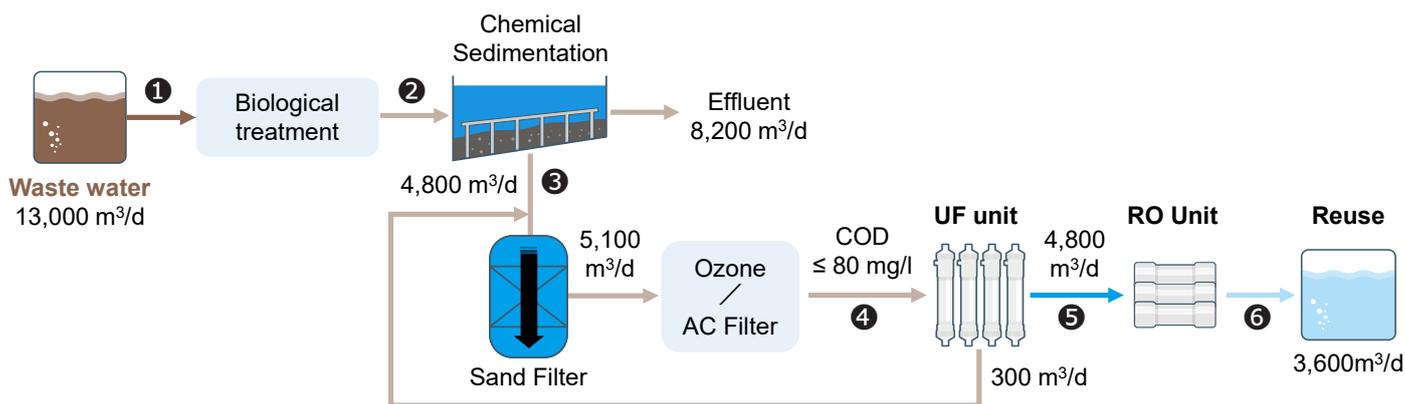


Figure 4: Wastewater Treatment System

Table 1 — Target Characteristics

	① Raw Wastewater	② After Biological Treatment	③ After Chemical Sedimentation	④ After AC Filter	⑤ After UF unit	⑥ After RO Unit (Permeate)
Water Temperature (°C)	32 - 35					
Capacity (m³/d)	13,000	13,000	4,800	5,100	4,800	3,600
TSS (mg/L)	> 500	< 100	< 30	5-20	-	-
Turbidity (NTU)	-	-	-	10-15	< 0.5	Not Detected
TOC (mg/L)	-	-	-	5- 25	-	<1
COD (mg/L)	1,200	200	< 100	45- 80	40- 75	< 5
Conductivity (μS/cm)	850	850	1,000	1,000	1,000	< 200
Color (Dilution level method)	< 2,000	< 500	< 400	< 200	< 200	< 5

CONCLUSION

UF membrane works well without replacement in nearly ten years, and RO membrane also works well within the warranty period and is replaced every 5 years. This system demonstrated high performance and achieved a very high level of customer satisfaction in the treatment of dyeing wastewater, which is considered one of the most difficult types of wastewater to treat due to its high pollution load and significant variations in composition.

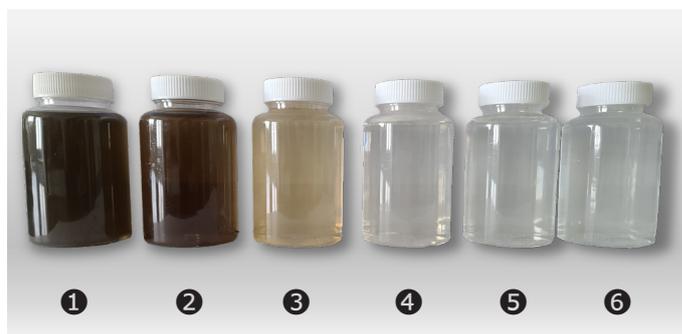


Figure 5: Changes in the color of treated water

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