

CASE STUDY

RO | UF | MBR | CHEMICALS

Wastewater Reuse
Nantong, China



TORAY

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



CASE STUDY

RO | UF | MBR | CHEMICALS

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

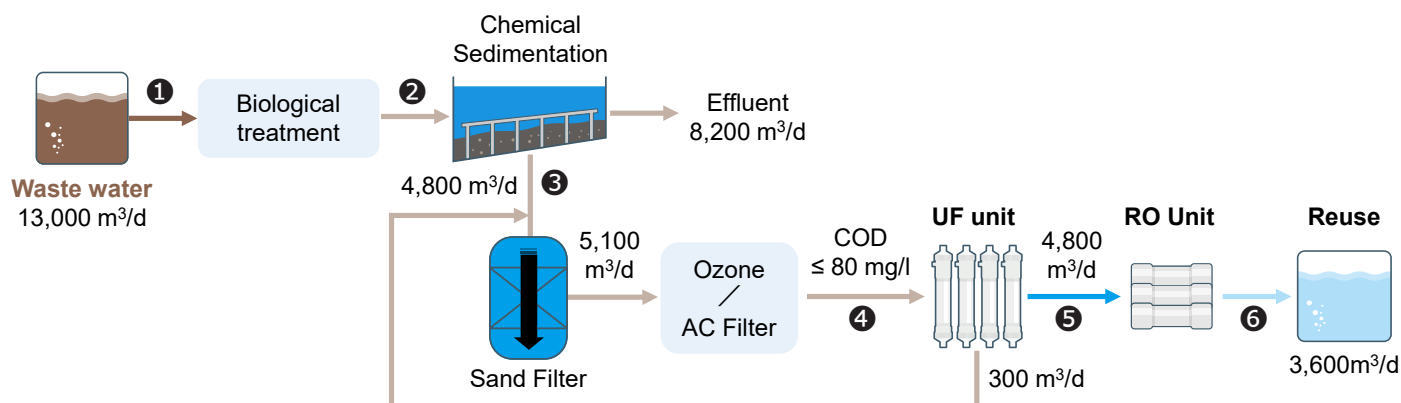


Figure 4: Wastewater Treatment System

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.

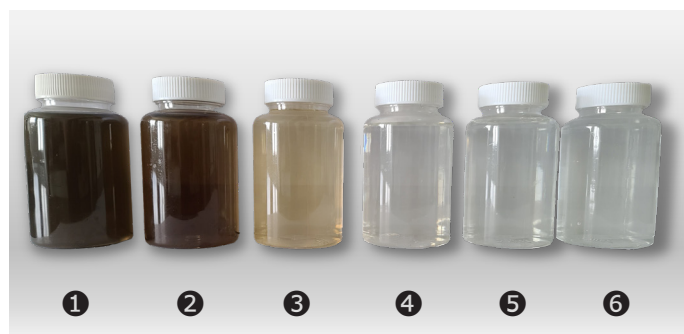


Figure 5: Changes in the color of treated water

TORAY ASIA PTE. LTD. (TAS)

111 Somerset Road, #14-22-#14-27, Singapore 238164
Republic of Singapore

+65-6226-0525 | www.water.toray | toraywater.toray.mb@mail.toray | [LinkedIn](#) | [YouTube](#)

TORAY

Innovation by Chemistry

Marks designated with a ™ or ® are trademarks of Toray Industries, Inc.

All information presented herein is believed reliable and in accordance with accepted engineering practices. Toray makes no warranties as to the completeness of this information. Users are responsible for evaluating individual product suitability for specific applications. Toray assumes no liability whatsoever for any special, indirect or consequential damages arising from the sale, resale or misuse of its products. © 2025 Toray Industries, Inc. Subject to change without notice.

CASE STUDY

RO | UF | MBR | CHEMICALS

Wastewater Reuse
Mansfield, United Kingdom



Toray RO Supports Quality and Sustainability in Textile Manufacturing by Purifying and Recycling Water



Figure 1 : Toray Textiles Europe Limited (TTEL)

PROJECT OVERVIEW

Toray Textiles Europe Limited, located in UK, is a leading manufacturing company supplying into apparel, medical, automotive, lamination, interiors, industrial & technical textile sectors. Water jet weaving technology is used to produce lightweight textiles and requires specific water quality to achieve efficient processing efficiency and product quality. This is achieved by recovering 65% of process water and blending with new raw borehole water before using Toray RO to successfully produce high quality recycled water.

BACKGROUND

At the inception of the weaving & dyeing factory design, a Toray RO membrane system was selected to ensure excellent water quality for the manufacturing process and to comply with ever tightening environmental regulation regarding water usage. The site is situated on top of an old coal mine from which the company extract borehole water for use in weaving and dyeing. As this borehole water contains calcium carbonate, iron, and organic matter, it required treatment to remove these impurities, making the membrane system an ideal technology to achieve required water specification.



Coaters / Laminators



Automotive



Medical / Surgical

Figure 2 : Textile Products of TTEL

Table 1 — Quick Facts

Client	Toray Textiles Europe Limited (TTEL)
Location	Mansfield, Nottinghamshire, United Kingdom
Operation start	1992
Production capacity	3,024 m ³ /d
Toray Product model	Toray RO SU-series
Application	Wastewater reuse in the textile industry

CASE STUDY

RO | UF | MBR | CHEMICALS

Toray RO Supports Quality and Sustainability in Textile Manufacturing by Purifying and Recycling Water

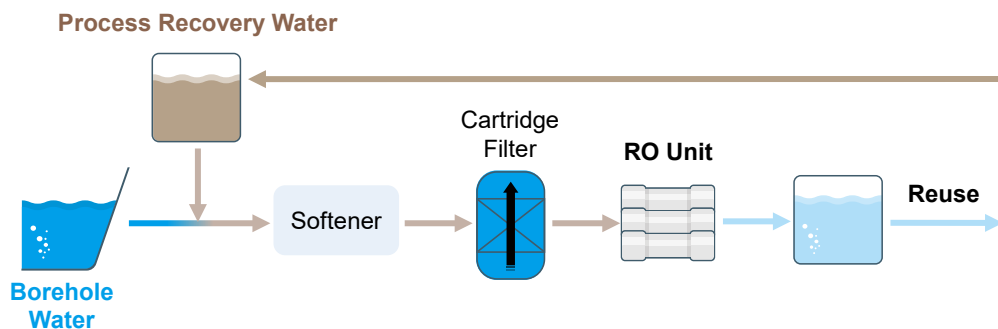


Figure 3 : Process Flow



Table 2 — Target Characteristics

	Raw Wastewater	RO Permeate
Water Temperature (°C)	14°C	
pH	7.65	6.80
Capacity (m ³ /d)	3,120	3,024
Hardness (ppm)	250	n / a
SDI	n / a	0.15
Conductivity (μS/cm)	720.0	7.4
Color	Clear	Clear



Figure 4 : RO Unit

RESULT

Thanks to TTEL's proper operation and maintenance, the Toray RO system has been running smoothly since its installation in 1992 without major issues in water quality or operational performance. The initial membranes were exchanged in 2001, and since then, the RO system has continued to deliver long-term reliability up to the present day.

CUSTOMER VOICE

We are highly satisfied with the quality and long-term durability of the Toray RO system and would recommend it to similar textile processing operations. Furthermore, the RO-treated recycled water can be reused not only in the water jet weaving process but also as boiler feedwater, supporting our sustainable business operations.

TORAY INDUSTRIES, INC.

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

+81-3-3245-4540 www.water.toray toraywater.toray.mb@mail.toray

[in](#) LinkedIn [YouTube](#)

Marks designated with a [™] or [®] are trademarks of Toray Industries, Inc.

All information presented herein is believed reliable and in accordance with accepted engineering practices. Toray makes no warranties as to the completeness of this information. Users are responsible for evaluating individual product suitability for specific applications. Toray assumes no liability whatsoever for any special, indirect or consequential damages arising from the sale, resale or misuse of its products. © 2025 Toray Industries, Inc. Subject to change without notice.

TORAY

Innovation by Chemistry