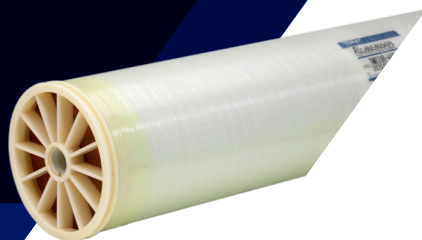


CASE STUDY

RO | NF | UF | MBR

Drinking Water Treatment
Thailand



TORAY

Innovation by Chemistry

Toray's Low-Fouling Reverse Osmosis Technology Keeps Replacement Costs Down at Wastewater Reuse Plants in Thailand

BACKGROUND

The Amata Corporation is an industrial real estate developer managing properties mostly in Thailand but also in Vietnam. Between two business parks in Chonburi and Rayong, Thailand, there are more than 500 factories and 1,100 manufacturers operating at these sites, some of which include Fortune 500 companies such as Toyota, Nestle, BASF, and Sony. The continuous supply of clean water is essential for sustaining these businesses and surrounding communities.

Amata Water, a fully-owned subsidiary of Amata Corporation Public Company Limited, manages the treatment and distribution of water. Amata Water operates under the mission of continually developing products and services for the tenants of Amata, while providing sufficient and sustainable water resources, purification systems, and wastewater treatment systems, with a particular aim toward environmental conservation.

The designated engineering firm and Build-Operate-Transfer (BOT) contractor for the water treatment plants (WTP) at both Rayong and Chonburi estates is TESCO (www.tescoenvigroup.com), who evaluated Toray's reverse osmosis (RO) membrane technologies to improve the water quality at the Amata estates.

PRODUCT SELECTION

TESCO conducted pilot tests of Toray's ROMEMBRA™ low-fouling reverse osmosis membrane elements alongside products by other leading RO membrane manufacturers. Since the feed water was tertiary wastewater containing various levels of organic and inorganic contaminants with high fouling potential, low-fouling membrane technology was preferred.

The pilot tests revealed that Toray's ROMEMBRA™ membrane did not require a clean-in-place (CIP) for an extended period (2–3 months for AMATA). This was one of the deciding factors for selecting Toray, including the prompt regional technical support that was available.

SOLUTION

For two-thirds of all wastewater, the WTP's at AMATA uses Sequencing Batch Reactors with Biological Aerated Filtration technology, while the remaining water is treated via conventional



Figure 1: Plant locations in Thailand

Table 1 — Quick Facts

Plant location	Rayong	Chonburi
Feed source	Tertiary wastewater	
Treatment	UF > RO	
Membrane model	TML20D-400	
Membrane type	Low-fouling polyamide	
Active area	37 m ² (400 ft ²)	
System capacity	9,360 m ³ /d	7,000 m ³ /d
Elements/train	6M	
End use	Industrial process and grey water	
Commissioned	Jan 2012	Dec 2015



Figure 2: RO permeate

activated sludge. Seventy percent of this tertiary wastewater is treated by ultrafiltration (UF) to reduce turbidity, followed by ROMEMBRA™ low-fouling RO membrane to reduce total dissolved solids (TDS) before being resupplied to nearby factories. The remaining thirty percent of the treated wastewater is used in the estates for irrigation of common areas and golf courses, and for cooling processes at the Amata B. Grimm power plants.

KEY RESULT

By using Toray's low-fouling polyamide composite membranes, the WTPs at the AMATA estates operated the RO systems for more than five years before requiring replacement of the RO elements. This low rate of replacement has considerably helped the end-user save operational and capital costs and is noted as one of the most successful wastewater reuse plants in Thailand.



Figure 3: RO skid

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