

# Improving RO Membranes Efficiency with Thermax Customized Treatment Program

## Overview

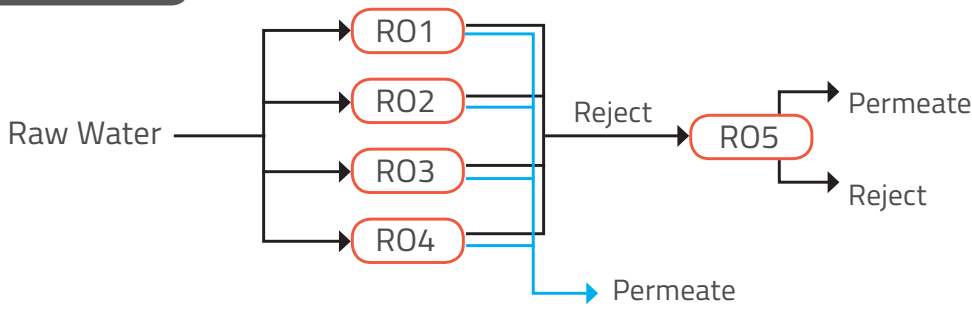
Thermax Chemicals is widely known for its technical expertise and offer customized solutions for RO membrane treatment across many industries. One of the major textile customer was facing challenge with respect to irregularities in operating cycles in their existing RO plant. Customer tried chemicals from various sources to solve the problem, but was unable to achieve desired results. Thermax technical team assessed the parameters resulting in irregularities, and helped the customer by increasing operating cycles and thereby improving overall performance of the system through our customized RO chemicals.



## Challenges

- Customer CIP (Cleaning In Place) process cycle was irregular for all first stage RO plants (No.1 to 4). Two out of four RO plants had short operating cycle of 10-12 days while the other two had operating cycle of 20-25 days resulting in frequent shutdowns. The cleaning effect was also not long lasting with the existing treatment program, thereby increasing maintenance costs for cleaning and chemicals consumption.
- Customer was facing high pressure drops across the RO membrane tubes frequently which was adversely affecting overall output and system performance.
- Despite online use of oxidizing biocide for incoming clarified water and non-oxidizing biocide for RO feed water, presence of organics and biofouling in the system were directly impacting the shelf life of RO membranes.

## System Details



RO Plant- 1 to 4	
Feed Flow Rate	265 m <sup>3</sup> /Hr
Permeate Flow Rate	212 m <sup>3</sup> /Hr
Recovery	80 %

RO Plant- 5	
Feed Flow Rate	100 m <sup>3</sup> /Hr
Permeate Flow Rate	50 m <sup>3</sup> /Hr
Recovery	50 %

## Thermax Solution

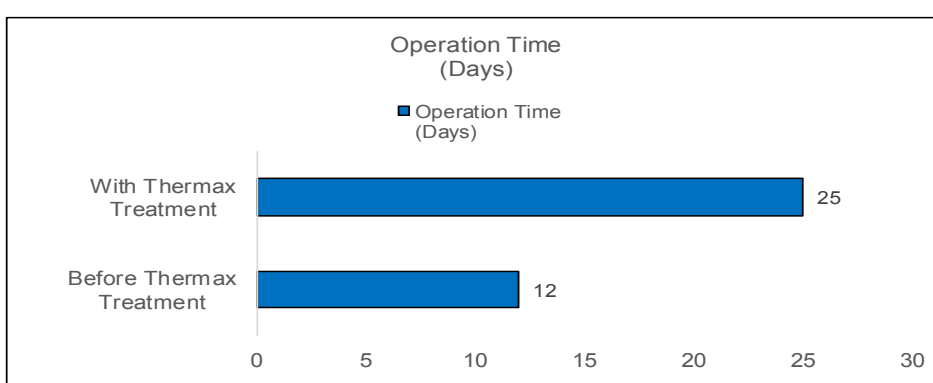
- Detailed analysis of RO feed water was done at Thermax lab to find out exact water chemistry.
- Based on analysed water parameters and other operational details, appropriate RO antiscalant was selected with the help of Thermax RO antiscalent software.
- Appropriate cleaning chemicals were recommended based on suspected scale compounds and foulants.
- Two different types of non-oxidising biocides were recommended to avoid immunity development in bacteria/slime. One biocide was recommended for online application while use of another biocide was for CIP. Dosing pattern was changed to achieve more sanitation effect.
- Thermax team supervised first CIP process at site and suggested some valuable changes in CIP processes. Accordingly, SOP was revised with respect to increase in dosing pump pressure & achievement of effective flow per tube / membrane.

Chemicals	Products	Dose
RO Antiscalant	Maxtreat-9118	3ppm
Biocide	Maxtreat-9651	2ppm
RO Cleaning Chemical (Acidic)	Maxtreat-9202	2%
RO Cleaning Chemical (Alkaline)	Maxtreat-9206	2%
RO Cleaning Chemical (Biocide)	Maxtreat-9601	2%

\*NSF listed antiscalents ensure the permeate water quality.

## Results

Using Thermax treatment, CIP was decreased by 100 % and operation cycle was achieved upto 20-25 days. Customer is highly satisfied with the service and technical support provided by Thermax team.



## Benefits

- Reduced cleaning frequency
- Increased shelf life of RO membranes
- Accelerated reverse osmosis capability of membranes
- Achieve desirable permeate water quality
- Increases output from RO plant

