

QUALITY ENABLES.

Case study about Slovnaft refinery, Slovakia

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Energizing Chemistry

Efficient process water treatment with Lewabrane® RO B400 HR

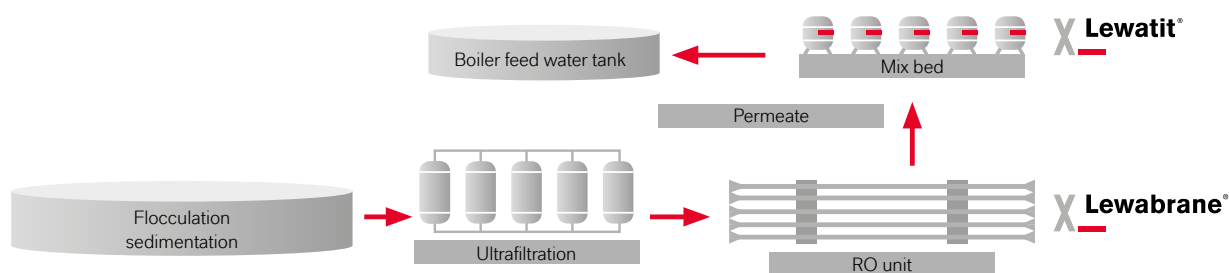
Application and system design

Lewabrane® RO B400 HR is used to produce water for a refinery in Bratislava, Slovakia. The water treatment plant is fed by surface water from the Danube river. The water is pre-treated by flocculation, followed by ultrafiltration (UF). The reverse osmosis (RO) system itself consists of five trains in three stages. After the RO, a mixed bed is used to produce demineralized water for boiler feed and other technological water demand in the refinery. The feed water quality varies in the range of 320–400 mg/l TDS (conductivity up to 580 µS/cm) and has seasonally dependant organic material content that may cause fouling.

At a glance

Industry	Refining industry
Application	Process water
Location	Slovakia (Central Europe)
Product	Lewabrane® RO B400 HR
Number of elements	630 pieces
Production capacity	16,200 m ³ /day
Water type	Surface water (Danube river)
Installation	December 2014

X Lewabrane®



Membrane performance

The operating company has defined performance requirements as follows: permeate conductivity (max. 15 $\mu\text{S}/\text{cm}$), permeate flow rate (up to 135 m^3/h) and recovery rate (up to 85%). Lewabrane® RO B400 HR replaced a competitive product that produced, after 4 years, a conductivity in the range of 40–50 $\mu\text{S}/\text{cm}$. Right after start-up, Lewabrane® confirmed the excellent salt rejection as projected with the LewaPlus® design program, providing permeate conductivity below 10 $\mu\text{S}/\text{cm}$ in all trains. After 4 months of operation, when pressure drop and permeate conductivity visibly increased, all RO trains were cleaned, restoring the initial parameters. It is worth highlighting that Lewabrane® membranes were cleaned after 4 months, while the previously used membranes required cleaning every 4–6 weeks, from the very beginning of their use.

Conclusion

Lewabrane® RO B400 HR membranes have fulfilled all requirements, especially providing very good permeate quality, with a rejection above the customer's expectations. After 6 months, stable permeate quality and permeate flux with lower cleaning frequency were confirmed. Thus, lower consumption of cleaning chemicals and reduced consumption of regenerate for the mixed bed could be realized.

Contact

LANXESS Deutschland GmbH
Liquid Purification Technologies
Kennedyplatz 1
50569 Cologne
Germany
Phone: +49 221 88850
E-mail: lewabrane@lanxess.com

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