

QUALITY ENABLES.

Case study about Slovnaft refinery, Slovakia

QUALITY WORKS.

LANXESS
Energizing Chemistry

Efficient process water treatment with Lewabrane® RO B400 HR

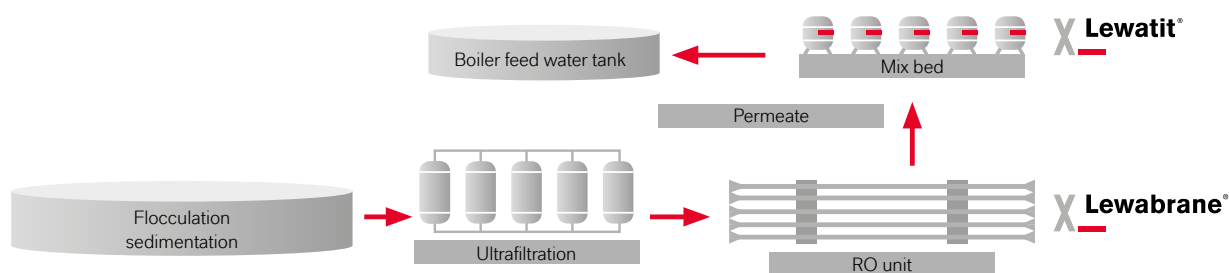
Application and system design

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 $\mu\text{S}/\text{cm}$) 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

We are happy to support your business. Please contact us for additional information: visit www.lpt.lanxess.com



Health and Safety Information: Appropriate literature has been assembled which provides information concerning the health and safety precautions that must be observed when handling the LANXESS products mentioned in this publication. For materials mentioned which are not LANXESS products, appropriate industrial hygiene and other safety precautions recommended by their manufacturers should be followed. Before working with any of these products, you must read and become familiar with the available information on their hazards, proper use and handling. This cannot be overemphasized. Information is available in several forms, e.g., material safety data sheets, product information and product labels. Consult your LANXESS representative in Germany or contact the Regulatory Affairs and Product Safety Department of LANXESS Deutschland GmbH or – for business in the USA – the LANXESS Corporation Product Safety and Regulatory Affairs Department in Pittsburgh, PA, USA.

Regulatory Compliance Information: Some of the end uses of the products described in this publication must comply with applicable regulations, such as the FDA, BFR, NSF, USDA, and CPSC. If you have any questions on the regulatory status of these products, contact – for business in the USA – the LANXESS Corporation Regulatory Affairs and Product Safety Department in Pittsburgh, PA, USA or for business outside US the Regulatory Affairs and Product Safety Department of LANXESS Deutschland GmbH in Germany.

The manner in which you use and the purpose to which you put and utilize our products, technical assistance and information (whether verbal, written or by way of production evaluations), including any suggested formulations and recommendations are beyond our control. Therefore, it is imperative that you test our products, technical assistance and information to determine to your own satisfaction whether they are suitable for your intended uses and applications. This application-specific analysis must at least include testing to determine suitability from a technical as well as health, safety, and environmental standpoint. Such testing has not necessarily been done by us. Unless we otherwise agree in writing, all products are sold strictly pursuant to the terms of our standard conditions of sale. All information and technical assistance is given without warranty or guarantee and is subject to change without notice. It is expressly understood and agreed that you assume and hereby expressly release us from all liability, in tort, contract or otherwise, incurred in connection with the use of our products, technical assistance, and information.

Any statement or recommendation not contained herein is unauthorized and shall not bind us. Nothing herein shall be construed as a recommendation to use any product in conflict with patents covering any material or its use. No license is implied or in fact granted under the claims of any patent.

All trademarks are trademarks of the LANXESS Group, unless otherwise specified. Status 03/2017