

QUALITY PURIFIES.



QUALITY WORKS.

LANXESS
Energizing Chemistry

Lewabrane® High Performance (HP) Brackish Water RO Elements

Key features

The Lewabrane® high performance (HP) elements consist of an enhanced brackish water membrane to serve applications where high rejection and energy efficiency are important. With an average salt rejection of 99.7% at 2,000 ppm NaCl at 15.5 bar (225 psi) and high permeability, it is a further development of the high cross-linked polyamide membrane, which LANXESS launched in 2012. The control of the degree of polyamide cross-linking during the production process provides a small effective “pore size” that results in high rejection of solutes, regardless of their charge. By optimization of the process, the flux could be improved without compromising permeate quality. Therefore, high rejection, even at changing feed parameters like pH or salinity, can be achieved at a high flux rate.

Applications

High rejection combined with high energy efficiency is useful in a number of industries. Especially if the RO process is designed in combination with another separation process like ion exchange. The benefit is based on the lower applied pressure and on the higher rejection, which leads to longer cycle times of the ion exchange units. Therefore, the typical applications are combined processes like the production of boiler feed water for power generation, zero liquid discharge processes (ZLD), or the production of ultrapure water. Yet, the product can also be used in innovative processes like the closed-circuit RO (CCRO process), in which the feed water composition changes with each cycle, the constant rejection is an important benefit of the HP type.

Product name	Permeate flow	Salt rejection	Membrane area	Feed spacer thickness	Dimensions (L/Ø/ID)
B400 HP	39.9 m ³ /day	99.7%	37.2 m ²	0.8 mm	1,016/201/29 mm
	10,500 gpd	99.7%	400 ft ²	31 mil	40/7.9/1.125 inch
B440 HP	43.9 m ³ /day	99.7%	40.9 m ²	0.7 mm	1,016/201/29 mm
	11,600 gpd	99.7%	440 ft ²	28 mil	40/7.9/1.125 inch

Elements are tested under the following conditions:

Applied pressure 15.5 bar (225 psi)
NaCl concentration 2,000 mg/l
Operating temperature 25 °C (77 °F)
pH 7 and recovery rate 15%

X Lewabrane®

High rejection of critical ions

Depending on the application, different species are rated as critical. For boiler feed water silica is critical, while wastewater applications focus on nitrate or organics. The Lewabrane® HP type ensures high rejection of these ions even at changing temperature and pH levels. To ensure that this is not only the rejection of sodium chloride which is measured, frequent tests in the laboratory are conducted in order to prove the rejection of solutes like nitrate and isopropyl alcohol (IPA). Typical rejection data are given in the following table.

	Nitrate	Silica	IPA	Boron
Typical rejection	98.5%	99.7%	95.0%	80.0%

The test conditions are the standard test conditions with 2,000 ppm NaCl and additional ions:

200 ppm nitrate, 5 ppm boron
50 ppm silica, and isopropyl alcohol at 1,000 mg/l (without NaCl)

The standard test conditions are pH 7, t = 25 °C, feed pressure 15.5 bar (225 psi), and a recovery rate of 15%.

Conclusion

Lewabrane® RO B400 HP and its companion product Lewabrane® RO B440 HP (with a 10% larger membrane area) are brackish water elements for most applications where permeate quality and energy efficiency are important. Using Lewabrane® HP elements in combination with monodisperse Lewatit® resins provides high quality produced water at low operational cost. We recommend using LewaPlus® design software to project the performance of the RO plant with HP membrane types.

Contact

LANXESS Deutschland GmbH
Liquid Purification Technologies
Kennedyplatz 1
50569 Cologne, Germany
Tel.: +49-221-8885-0
E-mail: lewabrane@lanxess.com

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



The following general disclaimer has been approved by the LANXESS Legal Department: 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 Health, Safety, Environment and Quality Department (HSEQ) of LANXESS Germany or - for business in the USA - the LANXESS Product Safety and Regulatory Affairs Department in Pittsburgh, PA. 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 your LANXESS Corporation representative, the LANXESS Regulatory Affairs Manager in Pittsburgh, PA or the Health, Safety, Environment and Quality Department (HSEQ) 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 01/2019.