

QUALITY ENABLES.



**Case study about wastewater treatment
in a chemical plant in Nagda, India**

QUALITY WORKS.

LANXESS
Energizing Chemistry

Efficient wastewater treatment A zero liquid discharge operation

Application and system design

This zero liquid discharge wastewater treatment plant is located inside the water treatment facility section of a major specialty chemicals producer. This wastewater plant processes treated sewage water via UF (ultrafiltration) pretreatment, cartridge filtration, and RO membrane desalination. The desalinated water is afterwards treated by degasification and ion exchange mixed beds installed with **Lewatit® MonoPlus S108 H** and **Lewatit® MonoPlus M 800** to prepare the boiler feed water. The installation is a two-stage system with a capacity of 38 m³/h. The feed water to the RO has a TDS in the range of 600–1100 mg/l. During two years operational time the permeate has an average TDS of 25 mg/l, and after the mix bed the requested quality of <0.1mg/l TDS and 0.02 mg/l silica is achieved. The concentrate is further treated by high-pressure RO and an evaporation step to achieve the zero liquid discharge operation.

At a glance

Industry	Chemical industry
Application	Wastewater treatment
Location	Nagda, India
Product	48 pieces Lewabrane® RO B400 FR 2000 l Lewatit® MonoPlus S 108 H 4000 l Lewatit® MonoPlus M 800
Production capacity	38 m ³ /hr
Water type	High content of salts and organics
Installation	April 2016

X Lewabrane®

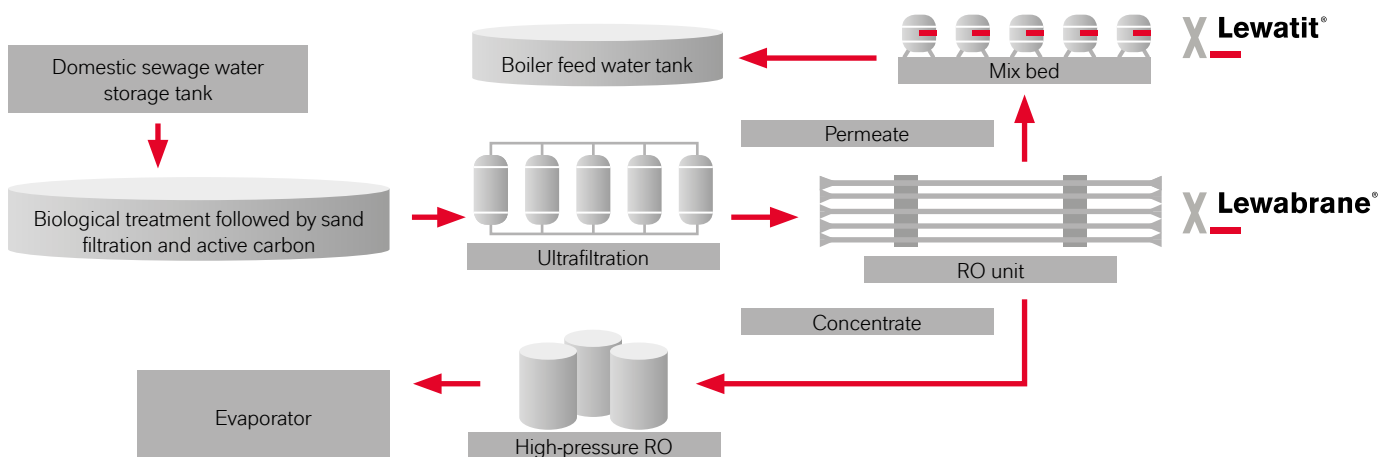
Membrane performance

The installation was originally designed around “ultralow energy” seawater elements. However projections with LewaPlus® design software showed that the requested permeate quality could be achieved with Lewabrane® RO B400 FR elements operating at lower pressure. After start-up, the predicted advantages of the Lewabrane® BWRO membranes were confirmed during routine daily operation. The RO feed pressure with Lewabrane® RO B400 FR was in average 10 bar the last two years and a system salt rejection of 97%, (similar to the rejection with the seawater RO elements). The new Lewabrane® elements also provided an increased silica rejection (of around 95%), which increased the cycle time between regenerations for the ion exchange system. After two years in operation, and although monthly cleaning is required, the rejection level is still in the order of 96.5%.

Conclusion

The results underline the advantages of a highly cross-linked membrane. The rejection is higher than low pressure seawater (SW) elements even after several years and frequent cleaning. The operational pressure could be reduced by around 20% compared to the previously installed element type. Apart from that, this process is an example of how the usage of ion exchange resins (IXR) and RO allows one to create a zero liquid discharge process.

Zero liquid discharge process at the Nagda plant



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

LANXESS
Energizing Chemistry

LANXESSDeutschlandGmbH
LiquidPurificationTechnologies
Kennedyplatz 1
50569 Cologne, Germany
Tel.: +49-221-8885-0
lewabrane@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, BIF, 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: 10/2019