

Membrane elements from LANXESS for seawater desalination:

Successful practice tests in Egypt

Cologne – Specialty chemicals company LANXESS showcased its new Lewabrane RO S product line at this year's Singapore International Water Week (SIWW) in early June 2014. The family of products currently encompasses three grades of spiral-wound membrane elements for reverse osmosis (RO), which were specially developed for seawater desalination. Alexander Scheffler, director of Membrane Business in the LANXESS Liquid Purification Technologies business unit, says: "Seawater makes up some 97 percent of all the water on earth. The desalination of seawater for use in farming and in drinking water production is therefore a very attractive alternative. Energy-efficient, eco-friendly desalination technologies like reverse osmosis play a major role in this field. For this and many other areas of water treatment, Lewabrane membrane elements are ideal in combination with our Lewatit range of ion exchange resins."

Practice tests passed with flying colors

Prior to official market introduction, the new membrane elements were tested for several months in desalination plants on the Red Sea in Egypt. Engineer Claus Mertes, Managing Director of Deutsche MeerwasserEntsalzung (DME) GmbH, a Duisburg-based company contracted by LANXESS to conduct the tests, presented the results at the SIWW in his presentation, "SWRO Membrane Performance – Pilot Plant Test Egypt." He reported that the new Lewabrane RO S elements meet or exceed the relevant industrial standards in continuous operation (24/7) under real conditions. They show high salt rejection even under fluctuating temperatures, salt contents and pH values, meaning that they deliver permeate in consistently high quality.

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For example, Lewabrane RO S400 HR elements have been undergoing testing in Sharm El-Sheik, Egypt, since March 2014 in a commercial, industrial-scale desalination plant, and an extensive set of conclusive data has been collected during this time. Under otherwise comparable conditions and in compliance with all required process parameters, an excellent water quality was achieved at a high permeate flow, for example.

Lewabrane RO S product range

Three different elements with high rejection rates (HR) are currently available: Lewabrane RO S400 HR, S440 HR and S085 HR 4040. The first two are 1,016 mm (40 in.) long with a diameter of 201 mm (8 in.), and have a membrane area of 400 and 440 square feet, suitable for use in all standard RO facilities. The third grade has a diameter of 101 mm (4 in.) and is suitable for smaller systems.

Lewabrane RO element	Dimensions* [mm]	Permeate flow [m ³ /day]	Salt rejection [%]	Membrane area [m ²]	Feed spacer thickness [mm]
S400 HR	1,016/201/29	24.6	99.8	37.2	0.8
S440 HR	1,016/201/29	27.3	99.8	40.9	0.7
S085 HR 4040	1,016/101/19	5.2	99.8	7.9	0.8

* L/OD/ID - length of the element/outside diameter of the element/inside diameter of the permeate channel

Test conditions: applied pressure 55.2 bar, NaCl concentration 32,000 mg/l, 25 °C, pH 8, recovery rate 8%

The high crosslinking of the polyamide layer lends the membranes substantially higher mechanical and chemical stability. Their key characteristics include:

- High salt rejection,
- High flow rate and thus productivity,
- Stable salt rejection throughout operating lifetime,
- Improved rejection of organic compounds.

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Comprehensive system design possible

In addition to its premium products for water treatment, LANXESS offers LewaPlus, a comprehensive software tool in several languages for designing membrane and ion exchange systems. The program supports both Lewabrane RO membranes as well as Lewatit ion exchange resins, meaning that it enables seamless modeling of both technologies in a single software application. Specifically for seawater treatment, it offers different energy recovery alternatives, such as turbochargers or isobaric processes, and over 5,000 possible configurations, including split pass processes, booster pump and concentrate recirculation in different process stages.

Further Information can be found at www.lewabrane.com.

LANXESS is a leading specialty chemicals company with sales of EUR 8.3 billion in 2013 and roughly 17,000 employees in 31 countries. The company is currently represented at 52 production sites worldwide. The core business of LANXESS is the development, manufacturing and marketing of plastics, rubber, intermediates and specialty chemicals. LANXESS is a member of the leading sustainability indices Dow Jones Sustainability Index (DJSI World and DJSI Europe) and FTSE4Good as well as CDP's Climate Disclosure Leadership Index (CDLI).

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Information for editors:

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