

LANXESS becomes one-stop-source for water treatment solutions:

### **Membrane filtration elements from Bitterfeld complement Lewatit ion exchange resins**

**Leverkusen/Bitterfeld** – On September 16, 2011, specialty chemicals company LANXESS has inaugurated its new production plant for membrane filtration elements in Bitterfeld, Saxony-Anhalt, Germany. The state-of-the-art facility is additionally equipped with laboratories, logistics areas and offices in order to deliver ready-to-use elements for reverse osmosis (RO) purposes to customers worldwide.

After completion of extensive pilot and development phases regular production will commence in Bitterfeld in the 4<sup>th</sup> quarter of 2011. The first RO membrane elements will be available on the market in the beginning of 2012. It is expected that with increasing market demand and planned expansions in production scale, the number of employees in the new facility will reach 50 within the next two years, and ultimately rise up to 200 people. With this new facility LANXESS will increase its product portfolio for the water treatment.

The product line of membrane filtration elements will be marketed under the brand name Lewabrane. LANXESS will therefore become one of the very few companies in the market which can offer expertise and products for both ion exchange and membrane filtration, namely the Lewatit and Lewabrane product lines.

Both RO and ion exchange technologies are complementary to each other, and are quite often combined to obtain optimum purification results. “Based on our many decades of experience with ion exchange resins, we consider our step into membrane technology as highly important in order to provide our customers with even more comprehensive desalination solutions in the future”, explains Jean-Marc Vesselle, Global Head of the Ion Exchange Resins business unit at LANXESS.

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### **Water filtration technology on the advance**

Membranes can be employed as a barrier for suspended and even dissolved particles. Depending on the size of the particles which are to be removed when a solution passes the membrane under pressure, micro, ultra, and nano filtration (with descending size of particles) can be distinguished from reverse osmosis. Employing reverse osmosis, even individual molecules, or ions respectively, can be removed from the feed stream. In this respect, the effect of RO membranes is “desalination”. This is comparable to demineralization by ion exchange resins where LANXESS possesses market leading products, extensive application experience, and global market access.

Reverse osmosis is an especially fast-growing and highly attractive market segment in the field of water treatment. Important examples of RO membrane application are the treatment of brackish water for demineralization, and usage in power production. Another common industrial application is the demineralization and particle removal step in microchip manufacturing. In these applications, the RO membrane step is often combined with ion exchange to provide high purity water. In addition, other application areas, such as seawater and waste water desalination, are examples of highly attractive application areas. Membranes are usually specified by their rejection value, i.e. the percentage of salt which can be removed from the feed water, and a throughput value, or productivity, defining the flux or production of permeate water per unit area and time.

### **Membrane element manufacture – a multi-step process**

The production of the elements starts with the membrane itself, which is a so-called thin-film composite (TFC), consisting of several individual layers. A non-woven carrier (thickness: 90 -100 µm) made of polyester functions as a substrate for a polysulfone support layer (40 -60 µm) and the active filtration layer (0.1 µm). The latter consists of polyamide, and is applied in a highly complex coating process. These RO membranes are prepared as flat sheet membranes, and

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subsequently assembled by a highly automated winding machine into a spiral wound element (device) whose purpose is to supply feed solution to the membrane surface, and collect the permeate (filtrate). After final assembly, the RO elements have standard dimensions, e.g. a length of 40 inches (approx. 1 m) and 8 inches (approx. 20 cm) in diameter. The active membrane surface of such an element amounts to approx. 400 square feet (approx. 37 square meters). The RO membrane element will provide rejection values of up to 99.7 percent with high water flux. The flux will vary according to feed water source and pretreatment design of the system. The quality of each RO element is controlled and measured in an Element Testing Machine according to international testing methods and standards.

### **Technology and Engineering**

The Lewabrane element family will consist of both 8 inch and 4 inch diameter membrane elements. The product spectrum will be further extended in the near future to address additional customer needs. The membranes operate according to the so-called cross-flow principle (tangential flow filtration, TFF), i.e. the majority of the feed water is not pressed right into the membrane (dead-end filtration) but travels tangentially across the surface of the filter membrane. This operation mode minimizes fouling and thus leads to an increased operation time of the membrane before cleaning or maintenance is required.

In order to allow customers to make optimum use of the new LANXESS RO membrane filtration devices, it will provide custom engineering design software to optimize the performance of the Lewabrane membrane system. This new software has been prepared as a major extension to the current Lewatit ion exchange dimensioning software. The water treatment designer will be able to move seamlessly from RO design to ion exchange design all within the same design package. This software tool will be available in early 2012 at the same time as the Lewabrane market launch. "The enhanced software will enable us to translate the benefits of our comprehensive product portfolio for water treatment into value-

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creating advantages for our customers,” Jean-Marc Vesselle emphasizes.

The Ion Exchange Resins business unit has currently around 500 employees worldwide with approximately 300 in Germany. ION belongs to the Performance Chemicals segment of LANXESS, which achieved total sales in fiscal 2010 of EUR 1,97 million.

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LANXESS is a leading specialty chemicals company with sales of EUR 7.1 billion in 2010 and currently around 15,800 employees in 30 countries. The company is at present represented at 46 production sites worldwide. The core business of LANXESS is the development, manufacturing and marketing of plastics, rubber, intermediates and specialty chemicals.

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