ELEMENT

REMOVAL

Removal and Preservation of Reverse Osmosis Elements

Lewabrane®

LANXESS
Energizing Chemistry

Index

1. Preservation and removal of Lewabrane® RO elements

1.1 Shut-down procedure

In general, we recommend that users follow the recommendation of the OEM for your RO membrane system. When this instruction is not available please use the following recommendation for the shut-down procedure.

General recommendations:

Use product or treated feed water for flushing the RO elements at low pressure and venting the system. A flushing with treated water for approximately one hour is recommended

Be diligent, and prevent air from entering the system (when the pressure tubes are filled with RO elements).

Depending on the system design, please take care to control the back-pressure on the permeate side. This back pressure should be never above 70 kPa (0.7bar or 10.15 psi)

Keep the RO elements wet during the storage period.

If the storage duration is longer than 7 days, flush the system with clean water and compatible preservatives to avoid biological growth in the system.

Make sure to control the temperature and pH during storage, and renew the preservatives latest after one month.

1.2 Storage and preservation of new elements

Please follow the storage conditions on the Lewabrane® Data sheets. These conditions are recommended to prevent biological growth on the membrane surface, and to avoid losses in flow and rejection performance of the RO elements.

1.2.1 Storage of new elements

New elements are preserved in 1% sodium bisulfite solution, and placed inside a sealed oxygen barrier bag. The cardboard box prevents exposure to direct sunlight, however, Lanxess still recommends storage under roof, in a closed building.

The temperature during storage should not exceed 35°C (95°F). A constant temperature at 25°C (75°F) is recommended. Freezing as well as exposure to direct sunlight of the RO elements should be avoided.

Open the cardboard package boxes just before the RO elements are to be installed.

An extended storage of elements without operation, for more than one year can lead to performance deterioration, below the designed values. Therefore, a storage period of less than one year is strongly recommended.

The RO elements may come on pallets. Do not stack more than one pallet on top of one other.

1.2.2 Storage in the RO system

If the RO system idle period is shorter than 7 days, the system can be shut down (see shut-down procedure) and the RO elements stored in the feed water solution. After 7 days the system should be flushed with sufficient volume of water to replace all water from the previous flush. An effort should be made to remove any air trapped in the membrane unit.

When the storage duration is longer than 7 days, a compatible preservatives must be added. Please contact your RO system supplier for appropriate recommendations.

Before long term shut-down the RO elements in the system should be cleaned to remove contamination and foulants from the RO system.

The RO system should be flushed with a solution of approved biocide. LANXESS recommends a 5000 -10000 ppm (0.5 – 1%) of sodium bisulfite solution. It is recommended to ensure that the RO elements are wetted by the sodium-bisulfite solution. The air, trapped in the system, should be flushed out, to prevent oxidation of sodium bisulfite. To remove air from the RO system, circulate the flushing solution for approximately one hour. Since sodium bisulfite is reacting with air, after circulation of the sodium bisulfite solution, close all valves on the RO system to avoid any exposure of the preservative solution to air. To control the decomposition of the sodium bisulfite, the pH should be monitored frequently (at least every 15 days). A decrease of the pH to 3 indicates that the sodium bisulfte is consumed and the solution should be renewed with fresh solution.

To restart the RO system, flush the system at low pressure for at least one hour to remove the preservative from the feed side, and flush an additional 10 minutes at high pressure to clean the permeate side.

1.2.3 Storage and preservation of used elements after removal

When the Lewabrane® elements are removed form pressure vessels for storage or shipping, the RO elements must be treated with preservative solution.

A solution of 5000-10000 ppm (0.5 - 1.0%) of sodium bisulfite should be prepared using high quality water, preferably RO permeate. Soak the RO elements for one hour in this solution. Then, take the RO elements out of the solution, drain them, place them in an oxygen barrier bag, and seal the bag.

Label the package bag with the packing date.

Store the RO elements as described for new elements. Check the pH of the solution at least every three months. If the pH is below 3, the solution should be renewed.

1.3 Removal and returning of used Lewabrane® RO elements

1.3.1 Removal of elements

During the operational period (while online), the diameter of the RO elements may slightly swell so that the removal of the RO elements may become more difficult than during the installation step. Please take this into consideration during the planning for the removal of the RO elements.

Disconnect the permeate ports, and depending on the pressure vessel manufacturer, also disconnect the brine and feed fittings.

If the RO elements of several pressure vessels are removed at the same time, please tag the removed RO elements, for return to the same position in the RO system.

Remove both end plates of the pressure vessel. Push the elements from the feed side until it is possible to handle the element at the downstream side. Pull out the RO element from the downstream side carefully, and remove the interconnector of the next element.

Repeat the last two steps. If more than two elements are installed, it is recommended to use a plastic pipe or something similar to push the RO elements through the pressure vessel. In the case of a re-installation or a shipment of the elements is planned, LANXESS recommends to place the RO elements into oxygen- barrier bags as described above in this Technical Service Bulletin.

1.3.2 Transport and returning of elements for inspection

Before sending elements for inspection to LANXESS, contact your sales representative, or visit our web site (www.lewabrane.com).

“Return Material Authorization” form (RMA) must be filled out, and sent to LANXESS.

Please prepare the RO elements as described in the chapter “Storage and preservation of used elements after removal”.

Please insure that the oxygen barrier bag is properly closed, the elements are labeled and the preservative solution is named (identified via CAS number) on the accompanying RMA document.

If available use the original Lewabrane® boxes for transport protection during the return shipment.

Send the RO elements to the address provided on the RMA Form. After LANXESS has received the RO element, an inspection number will be provided to allow follow up on the evaluation progress.

1.3.3 Disposal of used RO elements

The legislation for the disposal of used elements varies in different countries, and is dependent on the process water quality.

In most cases RO elements which were used to recycle water or to polish process water can be disposed in landfill or as municipal waste.

Please insure following items:

- The element should be cleaned and the preservative solution should be removed.
- There should not be any harmful or hazardous chemicals on or in the RO element (that is, no hazardous chemicals should have been introduced to the RO elements during the operational period), either during service or cleaning protocols.

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