

TREVER®|LITE Ion Exchange Resins

Loading Procedure for Water Treatment

This procedure covers initial loading of TREVERLITE ion exchange resins in columns to be used for water treatment applications such as softening, demineralisation and dealkalisation. This includes columns operated in coflow and counter current regeneration mode as well as packed bed systems with external regeneration systems. This procedure is not applicable for mixed bed units.

For obtaining optimum performance from TREVERLITE ion exchange resins it is important to load and commission them as well as operate them in the recommended method. Following procedure gives guidelines for the same.

PRELOADING PROCEDURE

1. Check and confirm that the correct grade of IER is being loaded, especially in situations where there are several columns that contain different type of IER.
2. Retain a 500 ml sample of resin for future reference.
3. Carry out internal inspection of the column and record details like internal diameter, height of column (HOS), type of distribution and collection systems, type and number of nozzles, position of sight glasses etc. This is important because once the column is loaded there is no way to check these aspects.
4. In case old resin is being replaced in an existing column, inspect the emptied column to ensure that debris and old resin is completely removed; ensure that there is no damage to internals of the column as well as to the distribution and collection systems. Also ensure that there are no blockages in the collection system. In case the column is rubber lined, check and ensure that the rubber lining is uniform and in good condition.
5. Pass water through the empty column at the intended service flow rate and measure empty column pressure drop.

LOADING PROCEDURE

Caution: Never use centrifugal pumps to load the resins, as it may damage the resin beads and result in fines generation, thereby increasing pressure drop across the bed. Resin may be loaded either manually through the top manhole or using a diaphragm pump using 2:1 ratio of water to resin. In case a pump is used, ensure that there is no contamination of resin through previously used pump. It is particularly important to ensure that an anion exchange resin bed does not get contaminated with even small traces of cation exchange resin.

Do not use raw water while loading the column, as it can introduce ionic impurities in the resin bed. Preferably use soft water while loading resin in a softener and use DM water while loading resins in a DM plant. If this is not feasible at least for anion columns use decationised or soft water.

1. Make markings on the outside of the column to correspond to support layer at the bottom of the column, height of the central distributor/collector and height of the top collector.
2. Carry out loading in 4 roughly equal parts. For example, if the total quantity to be loaded in a column is 4000 litres, load it in 4 steps of 1000 litres each.

3. Fill up half of the column with water.
4. Pour one part of the resin volume through the top manhole. The resin gradually settles in the water.
5. Open backwash valve and allow the water to rise at a flow rate of 5 to 15 m/h. The flow rate depends on type of resin and temperature of water (anion resins have lower density and hence need lower flow rate than cation resins).
6. Maintain this flow for 15-20 minutes. Check resin expansion through the sight glasses and top manhole, ensuring that there is no overflow of resin.
7. Shut off the backwash valve and allow the resin to settle.
8. Open the rinse outlet valve to drain off the water, keeping about 1 meter water above the resin level.
9. Repeat steps 4 to 8 with second, third and fourth part of the resin.
10. After all the resin is loaded, continue the backwash for about 30 minutes fully expanding the bed.
11. Gradually drain water from the column at a flow rate of around 5 m/h till only about 10 cm of water is left above the resin level.
12. Mark the resin level on the outside of the column and calculate the volume based on height and diameter of the column.
13. The resin bed is now ready for regeneration and use.

Operating conditions refer to the use of the product under normal operating conditions. They are based on experience in industrial applications. However, additional data are needed to calculate the resin volumes for ion exchange units. For more questions please contact our ion exchange experts.

Governmental regulations vary from country to country. Please seek advice from your local CHEMRA representative in order to determine the best resin choice and operating conditions.

Safety

Please note, that polymeric resins can swell significantly between the aqueous and pure solvent phases or when rewetted. Care should be taken. Glass columns and even steel columns can break. Wear glasses when using resin systems. To avoid high pressure build up, an operation in counter current or up-flow through the polymer bed shall be considered.

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Ion exchange polymers and adsorbents are generally of industrial grade and impure except otherwise stated by CHEMRA™. Chemicals and gases must be handled with care and by trained personal, regulatory requirements and safety standards must be met. Oxidative chemicals like nitric acid or peroxides can be explosive in combination with ion exchange polymers and adsorbents, others can be corrosive. Rewetted dry polymers develop heat and expand significantly. CHEMRA makes no warranties either expressed or implied as to the accuracy or appropriateness of this information and technical advice – whether given verbal, in writing or by way of trials – is given in good faith and expressly excludes any liability upon CHEMRA arising out of its use. Our recommendations cannot be seen as recommending the use of the product in violation of any patent or license. We recommend that the prospective users determine for themselves the suitability of CHEMRA materials and suggestions for any use prior to their adoption. Specifications might be subject to change without further notice. Materials safety data sheets and handling methods are available on request.

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