Before a column is filled with resin, it is important to check:

- The general condition of the column: bottom collector, top and intermediate distributors, column lining, support layer if any.
- The general condition of the resin charge if the bed is just being topped up.

It is advisable to paint marks outside of the vessel corresponding to the support layer (or the bottom plate in case of a nozzle plate collector), the height of the central distributor or collector, and the height of the top distributor. Cation resin can be loaded using feed water, but anion resins should be loaded using decationised, demineralised or softened water. The resin is usually loaded manually into the units. It can also be loaded mechanically, but only using an ejector or a type of pump that cannot damage the resin. Mechanical loading is done with a slurry of resin in water, with a ratio of 1 or 2 volumes of water per volume of resin.

LOADING PROCEDURE

The loading process should be carried out in three or four roughly equal resin fractions. The procedure described here applies to conventional resin columns, but the general principles are also valid, with some modifications, for Amberpack and other packed bed systems.

The column must first be filled to half its volume with water.

- Pour about one third of the resin charge into the column.
- Open the backwash valve and allow water to rise in the column at the rate of 6 to 15 m/h, depending on the type of resin and water temperature. Anion resins, having a lower density, are backwashed at a lower flow rate than cation resins.
- Maintain this upward flow for about 15 minutes. The resin level can be checked through the open manhole, from which the water overflows.
- Shut off the backwash flow and allow the resin to settle.
- Open the rinse outlet valve to drain the water partially. Close the valve when the water level is about 1 metre above the resin.
- Repeat the previous operations with the second and last thirds of the resin charge.
- When the complete charge of resin has been loaded, continue the backwash for 30 minutes to fully expand the bed.

After loading, the number of empty bags and drums should be counted as a safety measure to make sure that the correct type and amount of resin has been loaded.
BACKWASH OPERATION

The backwash operation is important to remove from the resin bed any particles or debris that may have been produced during the loading process.

After the backwash is complete, drain the water from the column at a rate of about 6 m/h until the water is about 10 cm above the resin surface.

Mark the resin level on the outside of the vessel, and calculate the resin volume.
Shut the manhole.

The resin is now ready for regeneration, for purification or for operation.

The above illustration is for a conventional, down-flow loading unit. In case of Amberpack™ or other packed bed systems, the resin must be backwashed with exactly the same care, using the special backwash column usually supplied with such equipment. Filling the resin into the ion exchange column, in this case, is combined with backwashing.

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Ion exchange resins and polymeric adsorbents, as produced, contain by-products resulting from the manufacturing process. The user must determine the extent to which organic by-products must be removed for any particular use and establish techniques to assure that the appropriate level of purity is achieved for that use. The user must ensure compliance with all prudent safety standards and regulatory requirements governing the application. Except where specifically otherwise stated, Rohm and Haas Company does not recommend its ion exchange resins or polymeric adsorbents, as supplied, as being suitable or appropriately pure for any particular use. Consult your Rohm and Haas technical representative for further information. Acidic and basic regenerant solutions are corrosive and should be handled in a manner that will prevent eye and skin contact. Nitric acid and other strong oxidising agents can cause explosive type reactions when mixed with Ion Exchange resins. Proper design of process equipment to prevent rapid buildup of pressure is necessary if use of an oxidising agent such as nitric acid is contemplated. Before using strong oxidising agents in contact with Ion Exchange Resins, consult sources knowledgeable in the handling of these materials.

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