

The general efficiency of a resin bed and the hydraulic characteristics depend on the way in which the resin is initially loaded into the column. Following the removal of any old resin, or prior to filling any new vessel, the following steps are recommended:

#### **PREPARING THE VESSEL**

Thoroughly hose down all internal surfaces to remove dirt deposits and any residual resin. Check the general condition of the column, including the internal collectors or distributors and the vessel lining. If there is a supporting layer, gravel or anthracite, measure to see that it is at the proper height and level. If it was disturbed during the resin removal process it must be reformed and re-leveled. It is a good idea to measure the exact level of the underdrain support system or sub-fill to indicate the bottom of the resin bed. Measure the distance from the bottom of the bed to a reference point near the top of the vessel. The edge of the manway is a convenient reference point.

Fill the vessel halfway with water, de-cat ionized or softened water is recommended for anion resin, and raw water or softened water for cation resin. Carefully add about 1/3 of the total of the resin charge into the vessel at a single time taking care not to damage internals. If the resin is in bags it can be easily dumped, one bag at a time, through the manway, if the resin is shipped in drums usually an eductor can be used to suck the resin out of the drums and into the vessel. Open the backwash water valve and allow a backwash to take place at between 3 to 6 gallons per minute per square foot. The backwash rate selected is subject to the type of resin and the backwash water temperature. Backwash for about 15 minutes and be careful to watch the level of resin through the open manhole from which the water is overflowing. After 15 minutes, stop the backwash flow and allow the resin to settle for at least one minute.

Drain the water in the vessel through the rinse outlet valve down to a level about 3 feet above the bed. Repeat the above operations when adding the rest of the resin 1/3 of the total charge at a time. When the last of the resin has been put into the vessel hold the final backwash for 30 minutes. After this final backwash allow the resin to settle and drain the water from the vessel again through the rinse outlet valve until the water level is several inches above the bed. Measure the distance from the reference point on the vessel to the top of the resin bed and calculate the bed height and subsequent volume from these measurements.

Add or subtract resin at this point to achieve the exact bed height and volume needed. You may want to perform the final backwash and bed height measurements several times and use the average of these measurements for the ultimate measure. This final backwash is very important to remove any resin fines or broken particles that may be present in the new resin. The fragments may appear to be lighter in color and sparkling on the top of the bed of the resin when you look down onto the bed through the open manway. Continue any backwashing until these fragments are removed.