



# DOWEX Ion Exchange Resins

## Recommendations for Loading an Internally Regenerated Mixed Bed with DOWEX\* Ion Exchange Resins

This procedure offers guidelines for loading and startup of a mixed bed with ion exchange resins. These procedures are specifically designed for equipment which is internally regenerated, with an interface collector between the cation and anion layers.

1. Before loading the resins, make a detailed inspection of the empty vessel:
  - Remove all debris of previous resins or foreign material.
  - Clean up distributors and collector, and inspect all laterals for damage or plugging.
  - Inspect the rubber lining for integrity, and perform a spark test, if possible.
  - Whenever possible check the pressure loss of the empty vessel at nominal flow rate (case of in-situ regeneration) and observe the flow patterns for uniformity.
2. Loading of the resins:
  - Fill vessel with sufficient water (~ 1/3 vessel height) to allow settling and avoid resin damage.
  - Load cation resin to around 5 cm (2 inch) below final desired level.
  - Backwash cation at 12-15 m/hr (5-6 gpm/ft<sup>2</sup>) for 30 minutes.
  - Settle and drain bed to 5-10 cm (2-4 inches) above resin surface and fill remaining cation resins up to the level of the central collector (if in H<sup>+</sup> form) or 3-5 cm (1-2 inches) below if in Na<sup>+</sup> form. Carry out a second backwash for 10 minutes and settle. Ensure that the resin surface is even and at the correct level.
  - With 1 meter (3 feet) of water above the cation resin, load anion resin. Backwash at 5 m/hr (2 gpm/ft<sup>2</sup>) for 5 minutes.
  - If anion resin is in Cl<sup>-</sup> form or cation resin is in Na<sup>+</sup> form, carry out double regeneration on both resin components.
  - Rinse resins with flow from top and bottom, with removal of rinse water through the central collector, for 30 minutes.
  - Reduce water level to around 5 cm (2 inches) above the resin bed and air mix for 15-20 minutes.
3. Start-up operation:
  - Start run and monitor rinse down until the specified conductivity, silica, and TOC levels are achieved.

NOTE: If the required water quality is not reached, resin clumping may still be present. To eliminate this, the mixed bed should be run for minimum 5 hours and then a further 15 minute air mix should be carried out at the end of the service run before backwashing to optimize resin mixing.

DO NOT TRY TO SEPARATE NEW OR FRESHLY REGENERATED RESINS

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## Ion Exchange Resins

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**Warning:** Oxidizing agents such as nitric acid attack organic ion exchange resins under certain conditions. This could lead to anything from slight resin degradation to a violent exothermic reaction (explosion). Before using strong oxidizing agents, consult sources knowledgeable in handling such materials.

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