



## PRACTICAL GUIDE

### Start-Up Procedure of Catalyst

#### Loading and washing

In general, no special pretreatment of the catalyst is required prior to loading into the reactor. Once the catalyst has been loaded, however, the following steps can be used to minimize any initial production problems. Although these steps are provided as examples of a typical or recommended sequence of operations for startup, it is highly recommended that each end-user also consult with their process licensor for additional recommendations.

1. **[For new plants / reactors]** If the reactor is made from carbon steel (as opposed to stainless steel), physically remove the rust and particulates from the vessel. This can be done in several ways including scrubbing down by hand, or by use of a water jet (SP3 or SP6). Care should be taken that the removed particulates do not become embedded in bed supports or screens.
2. **[Optional]** Fill the reactor at least 1/4 full with fully deionized water. This acts as a cushion during loading of the resin and helps prevent bead breakage or damage to the retaining screens. The water also helps the resin settle and pack properly.
3. Load the resin into the reactor by dumping from the SuperSak or drums or by using an ejector to dispense from the drums. Mechanical loading is done with slurry of catalyst in water, with a ratio of 1 or 2 volumes of water per volume of catalyst. The exact method used will depend on the packaging of the catalyst and the physical facilities available at the plant.
4. Backwash the catalyst with deionized water to remove fines and acidic color bodies. The water backwash also helps classify the bed but this is not strictly necessary from an operational standpoint.

- Open the backwash valve and allow water to rise in the reactor at the rate of 6 to 15 m/h depending on the type of catalyst and water temperature. 60% minimum bed expansion is recommended for a good backwash.
- Maintain this upward flow for about 30 minutes.
- Shut off the backwash flow and allow the beads to settle
- Open the rinse outlet valve to drain the water partially. Close the valve when the water level is slightly above the catalyst surface (about 10-20 cm).

If the backwash is not possible, a downwash at 2 BV/h with about 4 bed volumes (BV) of deionized water is an alternative option. A sample of the water after the 4<sup>th</sup> BV is taken at the outlet of the reactor to check pH and color (visual inspection). Stop the downwash when the pH is above 2 and the water is colorless. Drain the water from the reactor until the water is about 10-20 cm above the catalyst bed.

5. Remove the free water by flushing with the reactant feed. Draining of the water is not recommended because of the potential introduction of air into the interstitial space in the resin bed that can lead to corrosion problems later on.
6. Once the water is displaced, the normal feed stream can be introduced and the inlet temperature increased to the desired operating temperature.

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