

Resin Sterilization with Hydrogen Peroxide

1. Backwash the column of resin in a normal manner. If the resin is cation type used in the hydrogen form, brine treat the bed with 10% NaCl at 10 lbs/cu.ft. to remove any reactive substances from the bed, and verify pH is above 6.5 before proceeding. For salt regenerated exchangers, it is not necessary but may be helpful to regenerate first, to purge any build up of suspended solids.
2. Next, add sufficient hydrogen peroxide to make up a solution volume of 0.25% H₂O₂ equal to the resin volume. In cases of extreme contamination, hydrogen peroxide concentrations up to 1% may be used without significant risk of damage to the resin. Be sure to completely vent the tank holding the resin. Hydrogen peroxide decomposes back into oxygen gas which can significantly raise the pressure inside a closed tank.
3. Pass the solution slowly through the resin so that it takes at least 30 minutes to introduce all the solution. When all the solution has been introduced but is still covering the resin bed, stop the drain and allow the resin to soak in the solution for a minimum of 1 hour.
4. For complete sterilization, the hydrogen peroxide should remain in contact with the resin for at least 1 hour. Contact times up to 8 hours may sometimes be beneficial. Longer contact times probably do not improve sterilization results. Recirculating the solution during this time will improve results. Periodic agitation of the bed by air or paddle will also help.
5. Finally, the resin should be rinsed free of the solution using a minimum of 75 gallons of water per cubic foot of resin, to remove any disinfection by products that may have formed prior to return to service. If the unit is not placed in service immediately following sterilization, it should be pre-rinsed with a minimum of 15 gallons per cubic foot of final rinse water just before it is placed back into service.

WARNING: Hydrogen peroxide by itself does not damage ion exchange resins even at concentrations approaching 10%. However, the presence of iron fouling (or other metals) causes hydrogen peroxide to decompose. The decomposition is exothermic and occurs more rapidly when temperatures are elevated. This can result in a run away reaction where the temperature approaches boiling and or reaches explosive composition. ResinTech strongly urges caution when using hydrogen peroxide. Keep concentrations at or below 1%. Make certain that tanks are vented. Do not leave tanks unattended when full of hydrogen peroxide solutions. Do not leave peroxide in contact with resin for longer than 1 hour. If resin is iron fouled, treatment to remove the iron should be performed before use of hydrogen peroxide.

Peroxides react with many plastic materials causing rapid degradation. ResinTech makes no recommendations about the suitability of various material of construction to tolerate peroxide solutions and assumes no liability for damage.

