

# Cleaning Techniques for Electrodeionization Modules

OK, you now have the latest technology – electrodeionization (EDI), and your normalized operating data indicates that it needs to be cleaned. Exactly how do you do that?

Well, since EDI modules contain both membranes and ion exchange resins, cleaning techniques for both technologies need to be considered. Like RO membrane cleaning, we need to select the proper chemistry for the foulant. Like ion exchange resin cleaning, we need to take the foulant into account but consider the stability of the resin. We also need to consider where the fouling or scaling has occurred, whether in the dilute or concentrate chambers of the module.

The very first thing you need to do is to make sure the rectifier power is off and depressurize the system.

Since ion exchange resins are most stable in the salt (exhausted) form, at some point in cleaning and sanitizing an EDI system, the ion exchange resin may need to be completely exhausted. This is done using a sodium chloride solution made up of high purity salt, food grade (99.95% NaCl) or better. In fact, all of the chemicals used in cleaning an EDI system must be high purity grades to avoid depositing impurities in the modules during the cleaning process.

Cleaning chemistry is determined by where the fouling has occurred and what the foulant is:

- For cleaning scale from the concentrate chamber, use HCl. This is typically a shorter cycle because the resin does not need to be exhausted. \*HCl is also used for removing scale from the dilute chamber.
- For organic fouling, a brine/caustic solution may be used.
- For organic and inorganic fouling, HCl is used followed by a brine/caustic solution.
- For sanitizing, a peracetic acid/hydrogen peroxide solution may be used. Halane may also be used, but is not recommended for routine sanitizing.
- For scale and heavy biological fouling, HCl and the peracetic acid/hydrogen peroxide solutions are used in combination.
- For severe biological fouling a high pH step may be added, using caustic to elevate the pH.

Cleaning the EDI system is similar to cleaning RO systems in that the cleaning solution is mixed in the CIP tank and recirculated for a period of time, then rinsed with RO permeate quality or better water. Hydrochloric acid needs to be Technical grade; Sodium Hydroxide must be Purified, ACS grade or better. It is very important that you follow the module manufacturer's recommendations!

Remember, once you're done cleaning, the system needs to be regenerated to return to quality water. This can take up to 16 hours, so consider this when you schedule the cleaning.

EDI module cleaning is as much art as it is science. If you would like further information, recommendations, or assistance with cleaning your EDI system, contact your Process Solutions, Inc. sales representative. We'd be happy to help!