

ION EXCHANGE RESIN STORAGE CONDITIONS

NOT ABOVE 100 DEGREES F.

Epicor recommends that all ion exchange resins be stored below 100 degrees Fahrenheit. This will help to ensure that maximum ion exchange resin shelf life is obtained. Epicor has found that when resins are stored for long periods of time at high temperatures, there is an increase in the amount of warm water extractables that can be rinsed from the resin. These water extractables are organic compounds that are tightly bound to the matrix of the resin when it is first produced. Over time, these organic compounds can migrate to the surface of the resin and be rinsed off in warm/hot demineralized water.

As the resin continues to age, there is usually an increase in the amount of organics that can be rinsed / leached off the resin. This is often seen in the power plant as color throw, and, in some cases, as actual color changes in the resin itself. As a result, many utilities have a specification limit for the amount of water extractables and/or color throw from ion exchange resins. (Epicor also has its own product specification limit of 0.1% water extractables on all powdered and bead resin products.)

Although storage for short periods of time at 100°F. will not cause any immediate harm to ion exchange resins, it is not advisable to store the resins at high temperatures for long periods of time, (i.e. months). Increases in the storage temperature of the resins will also tend to increase the kinetics of the migration of these organics, which can result in the resin exceeding the water extractable limit prematurely. This is not unusual in that some types of resin will begin to physically degrade at elevated temperatures. For example, strong base anion gel resin, Type I, will begin to degrade at temperatures above 140°F.

NOT BELOW 32 DEGREES F.

Epicor has conducted extensive studies on the freezing-thawing of both bead and powdered ion exchange resins and have found that there are no significant adverse chemical or physical reactions associated with the freezing and thawing of the powdered resins.

The only potential problem that may be associated with the freezing of the powdered resin products would be a physical handling problem when removing the interior liner from the container. We have found that just several hours at room temperature is sufficient to alleviate this handling problem.

The more serious problems related to the freezing and thawing of ion exchange resins are based on whole bead resin tests. The whole bead resins will fracture and fragment when repeatedly frozen and thawed. This would result in an increase in the amount of fines present and a corresponding increase in differential pressure across the resin bed.

The powdered resins are manufactured so that there is little or no whole bead present and the majority of the particles are in the 200 to 400 mesh range. Any fracturing of particles this small will actually enhance the flocculation characteristics of the powders.

