resin cleaning/separation services

description and use

SUEZ provides cleaning and separation services for ion exchange resins. Resin beds requiring emergency treatment can be sluiced directly into either the six, 100 ft^3 (3 m^3) vessels on SUEZ's MobileFlow* trailer or into one to four 85 ft^3 (2.4 m^3) vessels on MultiFlow* trailers for transport to the nearest SUEZ Service Center. The resin beads will then be transferred to either external regeneration or separation vessels for processing which includes air scrub, backwash, chemical introduction, deionized water rinse, and reloading into the MobileFlow or MultiFlow units for transport back to the job site. Turnaround time at the SUEZ Service Center is 24 to 72 hours, depending on quantity and type of resins received.

As an option, should time permit, the resins can be repackaged, and dewatered in drums or cargo bags for shipment back to the job site by common carrier. Resins can also be received from the job site in drums or cargo bags delivered by common carrier.

Prior to commencing such services, a sample of the resin to be treated should be sent to SUEZ's laboratory to determine feasibility and cost effectiveness. Many times, the normal degradation of strong base anion resins, which results in a permanent loss of ion exchange capacity, will negate the effectiveness of cleaning.

The standard cleaning procedures employed by SUEZ include a soak and recycle step to maximize contaminant removal. All separations of cross-fouled resins are done by flotation techniques. SUEZ uses its technical and practical expertise to provide cleaning/separation services which will return the resins to a level as low in contaminants as any other cleaning/separation technique. However, SUEZ will consider following a customer provided cleaning recipe, if desired.

The standard cleaning or separation services do not include a final regeneration step since some prefer not to store regenerated form resins. Should the end user prefer the return of regenerated resins, this is an optional treatment which is readily available.

general properties

SUEZ's Service Centers are equipped with individual cation, anion, and mixed bed regenerators. in the size range of 100-300 FT^3. In general, minimum volume for individual bed cation and anion resins is 100 FT^3, whereas 250 FT^3 is the minimum mixed bed requirement, if regeneration following cleaning is desired.

SUEZ's 250 FT^3 mixed bed regenerators have a fixed interface at a ratio of 1:2 cation to anion. For resins having higher cation to anion ratios, the excess cation is removed from the bottom of the mixed bed regenerator and regenerated separately in the cation regenerator.

brine cleaning procedure (organics)

Backwash/Air Scrub – All resins will be thoroughly backwashed and air scrubbed until the backwash effluent is relatively free of suspended material indicating that this procedure has removed all of the surface foulants possible. Up to six individual air scrub and backwash steps may be used during this step over a six-hour time period.

Brine/Caustic Treatment – All treatments are done at 120°F (49°C). Approximately 1.5 bed volumes of a 10% NaCl/2% NaOH solution are passed down flow over a 30-minute period. Next, the solution is circulated for 2-4 hours, followed by a minimum four-hour soak time. This solution is displaced with approximately one bed volume of fresh warm brine/caustic then displaced and rinsed with deionized water to less than 50 µS. Minimum rinse volumes will be 30 gals. /FT^3. Anion resin will be substantially in the chloride form.

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iron fouled cation resins

Backwash/Air Scrub – All resins will be thoroughly backwashed and air scrubbed until the backwash effluent is relatively free of suspended material indicating that this procedure has removed all of the surface foulants possible. Up to six individual air scrub and backwash steps may be used during this step over a six-hour time period.

Chemical Treatment – SUEZ utilizes one of three treatments for removal of iron from cation resins. The method is determined by the analysis of the resin relative to its physical condition and a subjective evaluation of the degree of contamination. Because cation resins are often 1/3 to 1/4 the cost of anion resins, cleaning is not always cost effective for cation resin.

Lightly Fouled – Treatment is with 24 lbs. HCl/FT^3. Approximately 10 lbs. HCl/FT^3 are passed down flow through the resin. This is followed by a 4-18-hour recirculation/soak step. Next, an additional 5 lbs. HCl/FT^3 are passed down flow, displaced with D.I. water. The resin is then backwashed followed by an additional 9 lbs. HCl/FT^3, displacement, and final rinse. The resin will be in the hydrogen form.

Moderately Fouled – Treatment is with 25 lbs. $NaCl/FT^3$ and a proprietary dosage of sodium hydrosulfite approximately 15 lbs. $NaCl/FT^3$ are passed down flow through the resin followed by displacement, then another backwash and air scrub. Next, the resin is treated with sodium hydrosulfite, displaced, and again treated with 10 lbs. $NaCl/FT^3$ followed by a final rinse. The resin will be in the sodium form.

Heavily Fouled – The resin is allowed to soak in a 20-25% HCl solution overnight. This procedure is effective but rarely used since resins which are this badly fouled with iron are probably very old and often sufficiently oxidized by chlorine (high moisture) to not physically withstand this treatment.

separation of cross fouled resins

Backwash/Air Scrub – All resins will be thoroughly backwashed and air scrubbed until the backwash effluent is relatively free of suspended material indicating that this procedure has removed all of the surface foulants possible. Up to six individual air scrub and backwash steps may be used during this step over a six-hour time period.

Separation – Generally this problem is due to cation contamination of individual bed anion resins. SUEZ uses flotation in approximately 20% caustic solution to obtain complete separation. A specially designed, open top, "resin separation" which contains bottom and liquid interface site windows is used. No other technique can insure as good a separation as this for individual bed cross-contamination problems.

This technique cannot separate mixed beds containing an inert layer into three individual components, but can separate them into cation and anion components with the inert layer in each. Resins will be in sodium form cation and hydroxide form anion.

guarantees

SUEZ cannot guarantee the performance of cleaned resins in the customers' equipment since we have no control over many items which control ion exchange performance. These include equipment design, operator expertise, regenerant dosages, quality of pretreatment, age, and type of resins, variations in source water, etc. However, we do commit to a good faith effort that the resins returned will have been treated as well as technically possible to remove contaminants, even if it means extended chemical dosage or time than set forth in the above procedures.

contact us

For more information visit
www.suezwatertechnologies.com.