TECHNICAL DATA SHEET

FLOURIDE REMOVAL

Excess fluorides, which occur naturally in some waters, can cause mottling of tooth enamel in children under the age of 10. Removal of fluorides down to a level of 1.2 to 2.4 ppm has been mandated by the EPA for potable water systems.

Fluorides are also present in waste waters as a result of glass manufacturing, electroplating, steel, aluminum, pesticides, and fertilizer manufacturing. Fluoride at these higher concentrations can be removed by bone char or by lime precipitation as calcium fluoride with effluents expected in the range of 10 to 20 ppm. This treated waste water can then be polished with an ion exchanger.

Fluoride is also effectively removed by **ResinTech SIR-900**. Capacities of up to 2 kgr./cu.ft. are achievable with the use of this media. The best removal is seen when the raw water pH is in the range of 5.5, where the attraction of the fluoride ions is the greatest and the interference of competing ions is the least. At the beginning of the service run the effluent pH will be high and the fluoride removal will be minimal. As the effluent pH drops the fluoride removal becomes more effective and the water is suitable for use. Regeneration of ResinTech SIR-900 requires an upflow and a downflow rinse of 1% sodium hydroxide followed by a bed neutralization step with low pH influent water.

Low concentrations of fluorides can be removed by ion exchange using a strong base anion resin. **ResinTech SBG2** is preferred for potable water applications to minimize the introduction of taste and odor to the potable water from the resin degradation products. It is recommended that the resin first be cycled several times through exhaustion and regeneration and/or hot water wash. Effluent levels in the range of less than 1 ppm can be expected from a typical fluoride influent. Regeneration of the anion resin is accomplished by the use of sodium chloride applied at a dosage of 5 lbs. per cu.ft. at 5% solution strength with a minimum contact time of 30 minutes. The operating capacity is 12 kgrs. per cubic foot, for all anions except silica and CO_2. For example:

Ion	ppm as $CaCO_3$
HCO_3	17.2
Cl	8
SO_4	25
F	1
Total	34.2 ppm

$\frac{34.2}{17.1}$ = 2 gr/gal.

$\frac{12{,}000 \text{ grains/cu.ft.}}{2 \text{ gr/gal.}}$ = 6000 gals/cu.ft.

Procedure for Regenerating
ResinTech SIR-900
This procedure assumes a standard bed depth of four to five feet.

1) First backwash the bed at 8-9 GPM/SQFT for approximately 10 minutes. This should expand the bed approximately 50%. Be careful not to backwash the material out of the vessel.

2) Regenerate the bed with 1% NaOH. Upflow regeneration at 2.5 GPM is preferred for best results. The caustic dose should be approximately 3 pounds per cubic foot and the contact time should be at least one hour.

3) Slow rinse one tank volume to displace the caustic.

4) Fast rinse with raw water that has been adjusted to a pH of approximately 2.5 downflow through the bed until the effluent water pH reaches 9.0 to 9.5.

5) Adjust the influent raw water to a pH of 4.0.

When the effluent water pH reaches 8.5 or less, it is safe to return to service. Adjust the influent raw water to a pH of 5.5. A pH of 5.5. should be maintained throughout the remainder of the service cycle.

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