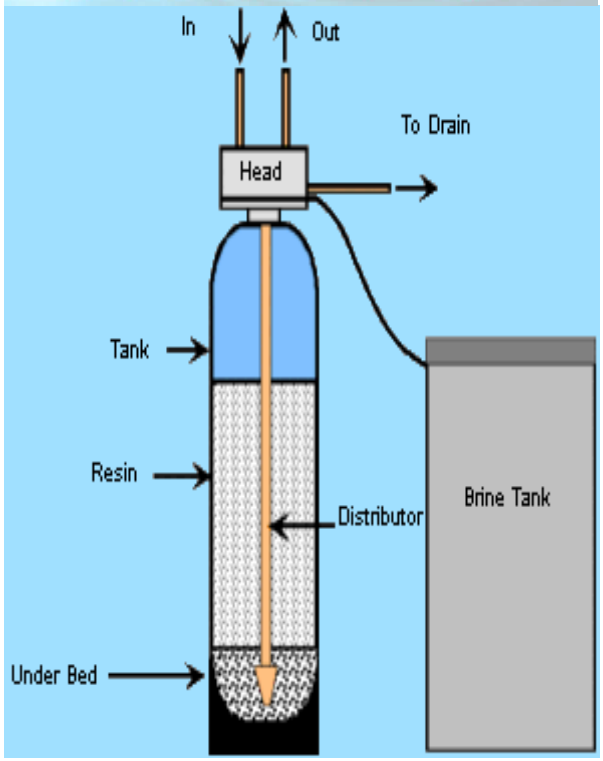

Water Softener Operation

(Material Data Sheet)

Anatomy and Operation of a Water Conditioner

Item	Purpose	Construction
Tank	Water pressurized vessel that holds the resin in place	Stainless steel
Head Cap & Fittings	Determines the frequency of backwash and controls the flow of water during service, backwash, brine cycle, brine refill and rinse cycle.	PVC Pipe
Distributor and Riser	Provides the return route to the head for the treated water	Plastic with a slotted basket at the bottom
Resin	Provides sites for the exchange of ions	Typically 10- 30 mesh
Underbed Gravel	Provides support for the media and a collection space for the treated water.	#20 or greater flint gravel
Brine Tank	Stores the salt that is used to regenerate the media	Plastic container with cover

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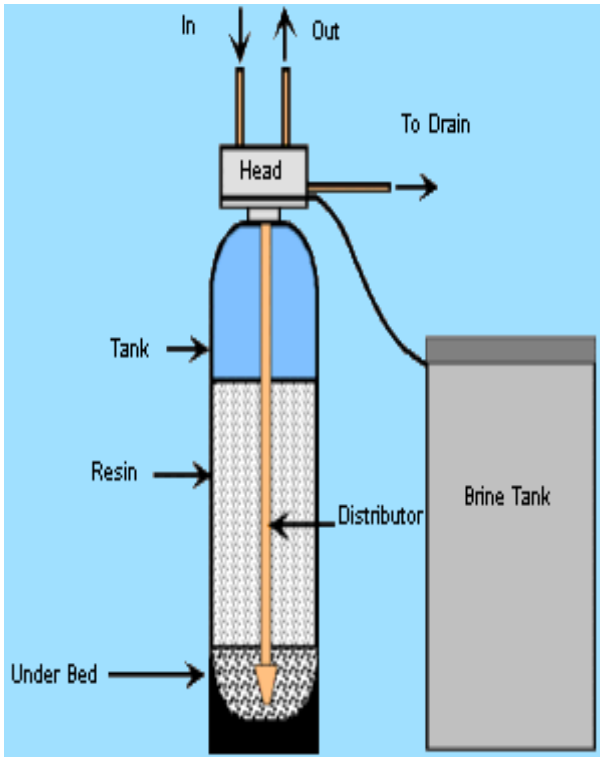
BODY guard

Centralize Water Softener

(Vir.10.7)

"Ensuring & Protecting Your Water for Outstanding Quality and Safety! We are your Bodyguard!"



Water Softener Operation

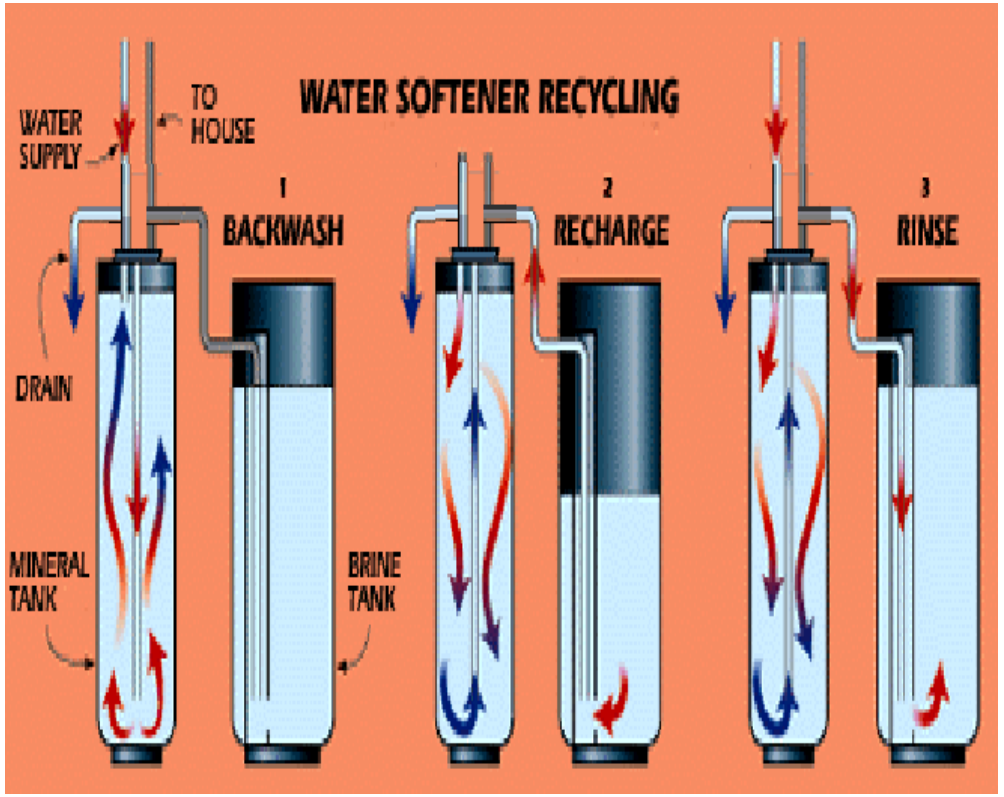
(Material Data Sheet)

Specifications:

Item V.10.07	Specifications & Purpose	Construction
Main Tank	• Pressure Tank, Vertical Disk head, Cylindrical Shell, Equip with tri media loading hole, lateral and under drain strainer. • Superior support against corrosion, electrolysis, & rust. • Pressure tank is made of Food Grade Fiber Glass Reinforced Plastic	Stainless steel
Working Pressure	25 Psi	
Tested Pressure	35 Psi	
Diameter Height	15 “ 34 “	
Thickness of Plate	5 mm	

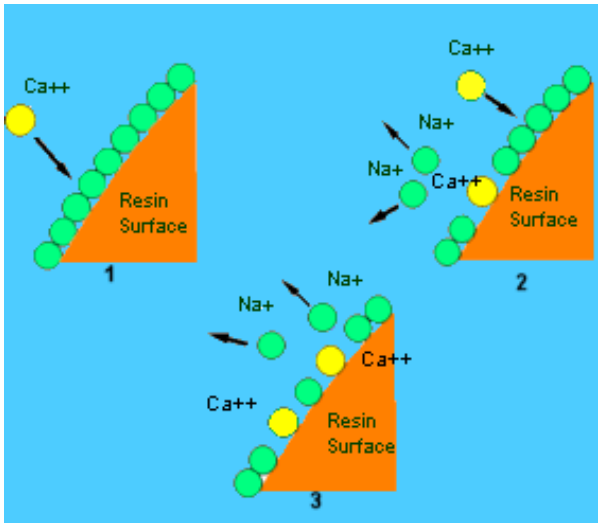
Item V.10.07	Approximate Regeneration Frequency
Exchange Capacity	6,000 gals. Per Cycle
Volume of Resin	1cuft. Or 28 liters of Strong Cat Ion Exchange Resin
Service Flow Rater	4 gpm
Backwash Flow rate	6 gpm
Brine Ejector With Tank	½ PVC
Main Connection	1” PVC pipes, valves and fittings
Volume of regenerant	8 lbs of salt / cuft. Of resin
Regeneration Frequency	Every After Collection of 6,000 gals.
Quality of Effluent	147 ppm CaC03 – Total Hardness: 0 – 70 ppm

To understand the operation of a water conditioner (softener), one must first understand the concept of ions. Many chemical elements form compounds that when dissolved in water separate and form electrically charged particles called ions. These ions are surrounded by water molecules. Because opposite charges attract each other, these ions move to and attach themselves to objects with charges opposite theirs.



A common compound that demonstrates this property is NaCl (Sodium Chloride or common table salt). The ions that are formed in water from this compound are Na+ and Cl-. The small +/- signs indicate these elements have formed ions and that their charges are either positive(+) or negative(-). Their are many elements that form ions when dissolved in water that have undesirable characteristics. Some common ones are:

Ion	Characteristics
Ca++(calcium), Mg++(magnesium)	Gives water the characteristics we call hard. It causes - damage to heating appliances and fixtures because of scaling, excessive soap usage, dry skin and premature deterioration of fabrics washed in water containing it.
Fe++ (iron)	When exposed to air turns red/orange and cause staining
Mn++(manganese)	When exposed to air turns black and causes staining

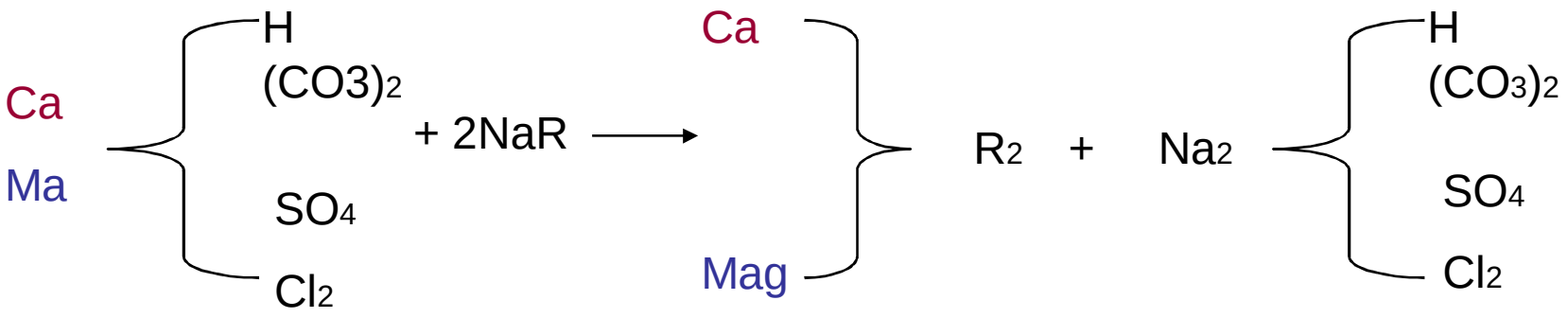


The water conditioner consists of two tanks- a resin tank and a brine (salt) tank. The resin tank is filled with a resin that consists of small plastic beads. This resin is called cation ("cat" "ion") resin. The beads have a permanent charge. The charge causes the beads to attract positively charged ions. The resin is placed into service with Na+ ions on the beads. When the hardness ions (Ca++ and Mg++) come in contact with the Na+, they remove the Na+ and take the Na+'s place on the beads. The Na+ is now dissolved in the water (see figure above). This sodium leaves the resin tank and is delivered to the tap with the water (see sodium and softening).

When most of the Na+ is removed from the resin beads the softener head starts the regeneration process. It sets the control to allow raw water to go to the house during regeneration. This is done so none of the salt used during regeneration can enter the house plumbing. The resin is then regenerated by drawing in a high concentration salt (NaCl) solution from the brine tank. This salt solution is washed over the depleted resin. The salt solution contains Na+ and Cl- ions. The Na+ is placed back onto the beads and the Ca++, Mg++ and Cl- are washed down the drain. The media is then rinsed with fresh water to remove all the remaining salt. More water is added to the brine tank to dissolve salt for the next regeneration. The head then sets the control to service and there is treated water again available at the house.

During the process, Calcium and Magnisium are removed from hardwater by cation (cat – ion) exchanger for sodium ions.

When the exchanger becomes almost changed to Calcium and Magnicium compounds, it is regenerated to restore the sodium ions with salt solutions, to have a ph between 6 and 8.



SOLUBLE **INSOLUBLE** **INSOLUBLE** **SOLUBLE**

When the ability of the cat ion exchanger bed to produce completely, softened water is exhausted the softener unit is temporarily cut off service, backwashed to cleanse and hydraulically regrade the bed, regenerated with a solution of common salt (NaCl). Which removes Ca. and Mag. In the form of their soluble chlorides and simultaneously restores the cat ion exchanger to its Na state.

Rinse free of these soluble by products and the excess salt and then returned to service ready to soften another equal volume of hard water.