

HOW THE RV SERIES SOFTENER WORKS

The RV Series softeners use "ION EXCHANGE" to remove the hardness minerals and certain other contaminants from the water. The RV Series softeners contain a bed of permanent softening material in the form of small granules or beads which are initially charged with sodium ions. As the hard water passes through the bed, the calcium and magnesium which cause water hardness are attracted to the softening material and held. At the same time, a chemically equivalent amount of sodium is released into the water.*

This ion exchange process occurs literally billions of times during the softening process. Eventually so much hardness accumulates that the initial supply of sodium is depleted and the bed of softening material is considered "exhausted." Water passing through the softener in this condition would retain much of its hardness, and recharging or regeneration is necessary.

To prepare the softener for further service, brine (solar or rock salt - **not pellets**) is flushed through the bed. This drives out the accumulated hardness and replaces it with sodium. After the hardness and excess brine are rinsed down the drain with fresh water, the renewed softening material is once again ready to remove hardness from the water.

This softening - regeneration cycle can be repeated almost indefinitely over many years of service in the RV.

Water softener capacities are given in terms of the number of grains of hardness they will remove between successive regenerations. (The capacity of the RV 1200 is 10,000 grains - RV 2400 is 24,000 grains - RV 3200 is 32,000 grains) The number of gallons softened between regenerations is calculated by dividing the rated capacity (in grains) by the number of grains of hardness in one gallon of water. The following table shows how this calculates.

Hardness of Water Supply in Grains Per Gallon	Rated Capacity of Softener in Grains of Hardness Removed		
	(RV1200) <u>10,000</u>	(RV 2400) <u>24,000</u>	(RV3200) <u>32,000</u>
5	2000 Gal.	4800 Gal.	6400 Gal.
10	1000 Gal.	2400 Gal.	3200 Gal.
15	667 Gal.	1600 Gal.	2133 Gal.
20	500 Gal.	1200 Gal.	1600 Gal.
30	333 Gal.	800 Gal.	1067 Gal.
50	200 Gal.	480 Gal.	640 Gal.

* See reverse side for more information on sodium in softened water

SODIUM IN SOFTENED WATER

Since sodium is added to water softened by the cation exchange process (mechanical water softening), the level of sodium in softened water may be of interest to persons on sodium restricted diets.

Table 1 shows the amount of sodium added to softened water of varying original hardness. The harder the water originally, the more sodium that is added.

Initial Water Hardness Grains per Gallon	Sodium added by Cation Exchange Softening of Water	
	Milligrams Na+/Gallon	Milligrams Na+/Quart
1	30	7.5
5	149	37
6	179	44
7	209	52
8	239	60
9	269	68
10	298	75
15	447	112
20	596	150
30	894	225
40	1,191	300

CONTRIBUTION OF SODIUM FROM WATER SOFTENING TO TOTAL SODIUM INTAKE

Assuming a daily intake of 5 grams (5,000 milligrams) of sodium in food and the consumption of 3 quarts of water (used for coffee, tea, food preparation, and drinking) the contribution of the sodium (Na+) in the water from the home water softening process compared to the total daily intake can be seen in the table 2.

Initial Water Hardness/ Grains per Gallon	Milligrams Na+ Per 3 qts. Softened Water	Milligrams Na+ from Food	Total Na+ Consumed Milligrams	% of Total from Softened Water
1	23	5,000	5,023	0.4%
5	112	5,000	5,112	2.2%
10	223	5,000	5,223	4.3%
15	335	5,000	5,335	6.5%
20	447	5,000	5,447	8.2%
30	670	5,000	5,670	12.5%
40	893	5,000	5,893	15.2%

SODIUM-RESTRICTED DIETS

Persons who must restrict their sodium intake to 500 milligrams per day should consume water that contains no more than 20 milligrams of sodium per quart. This is assuming that most people consume about three quarts of water per day from all sources (beverages, food preparation, and drinking). **Twenty** milligrams per quart X **Three** quarts equals **Sixty** milligrams total daily from water.

The 60 milligram level has been suggested since the basic 500 milligram therapeutic diet actually contains about 440 milligrams of sodium from food. This allows 60 milligrams of sodium from water.

If sodium (Na+) is restricted to 1000 milligrams per day, the upper limit for total sodium content of water is about 200 milligrams or about 66 milligrams per quart if three quarts are consumed.

See Table 3 for original hardness limits of softened water for different levels of water consumption.

If an ion exchange water softener is to be used in a home where a person is on sodium-restricted therapy and water hardness is great enough that excess sodium may be consumed by using softened water, a bypass can be installed to provide unsoftened water for drinking and cooking.

Total Sodium Level Permitted	Total Sodium Allowed From Water	Original Hardness Limits in Grains per Gallon (gpg) if Consumption of Softened Water is:		
		3 Qts.	2 Qts.	1 Qt.
500 mg.	60 mg.	2.6 gpg	4 gpg	8 gpg
1000 mg.	200 mg.	8.8 gpg	13 gpg	26 gpg

In some localities the sodium content of the municipal water supply and water from wells may also be higher in sodium than can be allowed.

Persons on sodium-restricted therapy can obtain advice from a physician or dietitian. The municipal water department will provide a detailed analysis of the water supply. Detailed analysis of well-water can also be obtained. Contact the municipal water department, the Public Health Service, a local water softening dealer, or the Cooperative Extension Service for the name and address of a laboratory which makes this analysis.