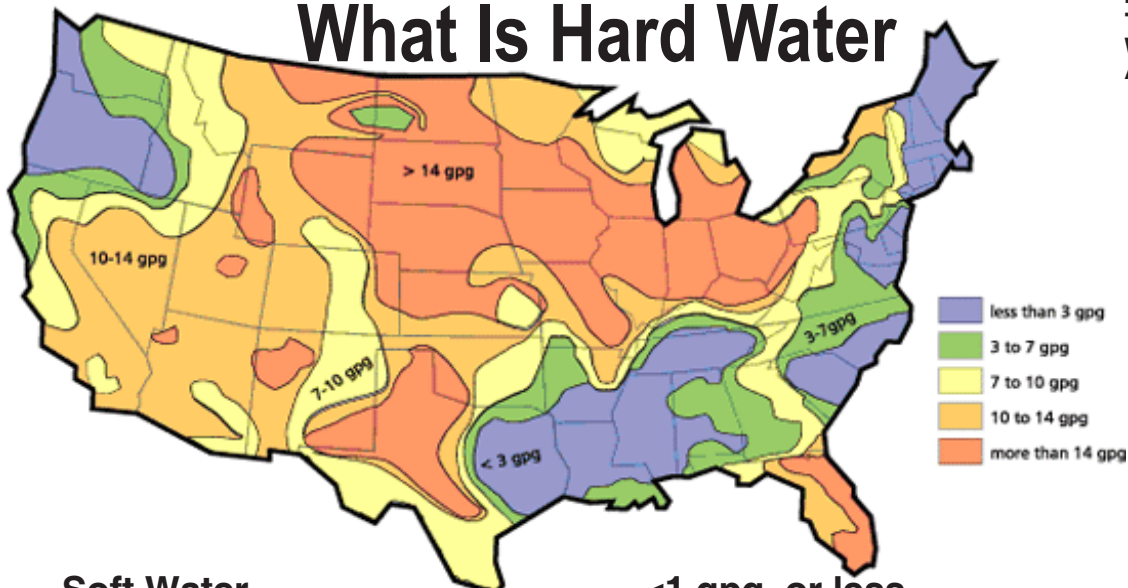


What Is Hard Water



Soft Water
Moderately Hard
Hard
Very Hard
Extremely Hard

<1 gpg or less
1 - 3.5 gpg
3.5 - 7 gpg
7 - 10.5 gpg
> 10.5 gpg and above

Hard Water Effects On Plumbing

Water lines filled with deposits



Clogged Drain Lines



86% Of All Water Heater Failures Are Due To Hard Water

Water Quality Association Independent Study (released April 14 2010)

Gas Water Heaters:

Each five grains per gallon of water hardness causes an 8% loss in efficiency and 8% increase in cost when using 100 gallons of hot water per day in gas storage tank water heater. (On 30 gpd hard water, that is 48% loss of efficiency in water heaters)

Tankless Heaters:

Tankless heaters operated on soft water maintained the original factory efficiency rating over a 15 year life span. The study found that tankless water heaters completely failed to function because of scale plugging in the down stream plumbing after only 1.6 years of equivalent hot water use. Soft water saves 34% of cost compared to operating on 20 gpg.



Water Heater



Tankless Water Heater

The Restriction and Reduction of Flow Rate and Pressure Loss is the Reason Most Water Softeners “Do Not Meet Plumbing Code”

•The First and Foremost Plumbing Code Requirement is “Certification”

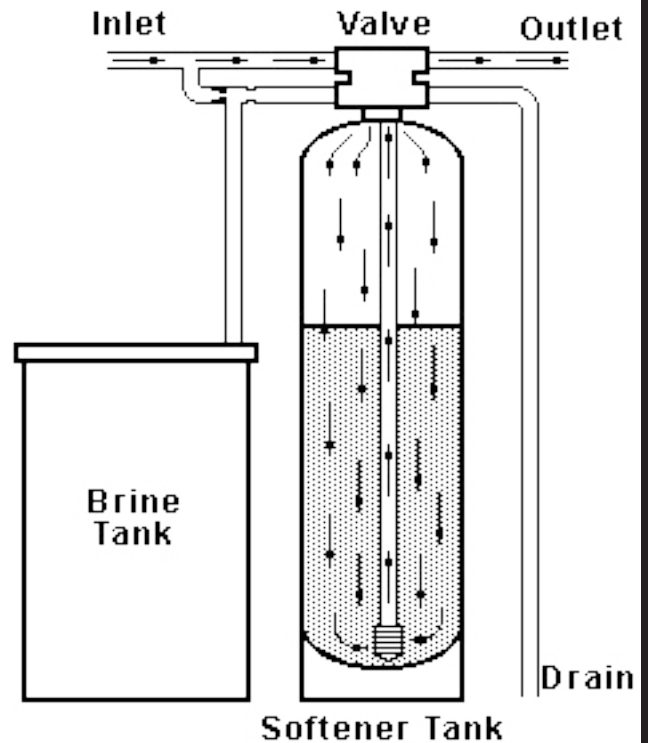
•All Water Softeners Must Be NSF 44 Certified.

Reference: IPC. 105.32 303.4 611.4



•Chapter 6 Requires All Equipment to Meet the Flow Rate and Pressure Loss Demand for the Application.

•Without Certification it is **“NOT POSSIBLE”** to determine if the equipment has the proper engineered sizing to meet the requirements of the intended application.



Quick Reference Guide for Fixture Unit Count And Water Softener Sizing. Fixtures and Load Values Assigned in Fixture Tables E103.3

Table 1

Bathroom Group	3.6
Kitchen Sink	1.4
Dishwashing Machine	1.4
Washing Machine	1.4
Shower	1.4
Lavatory	0.7
Water Closet	2.2
Bathtub	1.4

Table 2

Size	Fixture Units	Flow Rate (GPM)	Meter	Main Water Line
1 Bath	7.8	12.8	3/4"	3/4"
2 Bath	11.4	15.4	3/4"	1"
2 1/2 Bath	14.3	17.0	3/4"	1"
3 Bath	15.0	17.5	1"	1"
3 1/2 Bath	17.3	18.4	1"	1"
4 Bath	18.6	19.0	1"	1"
4 1/2 Bath	20.9	19.7	1"	1"
5 Bath	22.2	21.5	1"	1"

This example is intended for quick reference only, refer to actual code for verification

Chart is Based on International Plumbing Code 2000-2012.

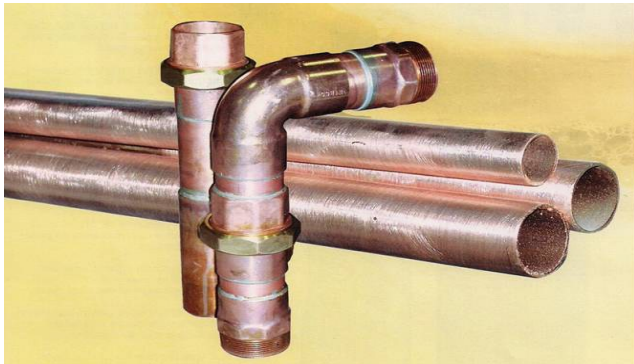
Reference: Table (E103.3)
Example provided by: National Home Builders Association
Reference: Plumbing Code Requirements and Sizing Guide for Residential Water Softeners, Second Edition.

Table 2 was created by NG Sales (Tony Marlin), as an aid and quick reference guide to common fixture counts, however actual fixture counts may vary with addition or subtraction of fixtures.

Criteria used for creating Chart:
Water Line sizing was done with 50 to 60 PSI with a developed length of 40 to 50 feet
Single Laundry
Single Kitchen sink with dishwasher
3 fixtures per Bath
Hose bibs not used in fixture water load.

Morrison ExSteam Engineered Water Softeners

Size your Softeners by the Size of the Main Water Line



3/4 Pipe 48,000

1" Pipe 70,000

1.25 Pipe 90,000

48,000 Grain

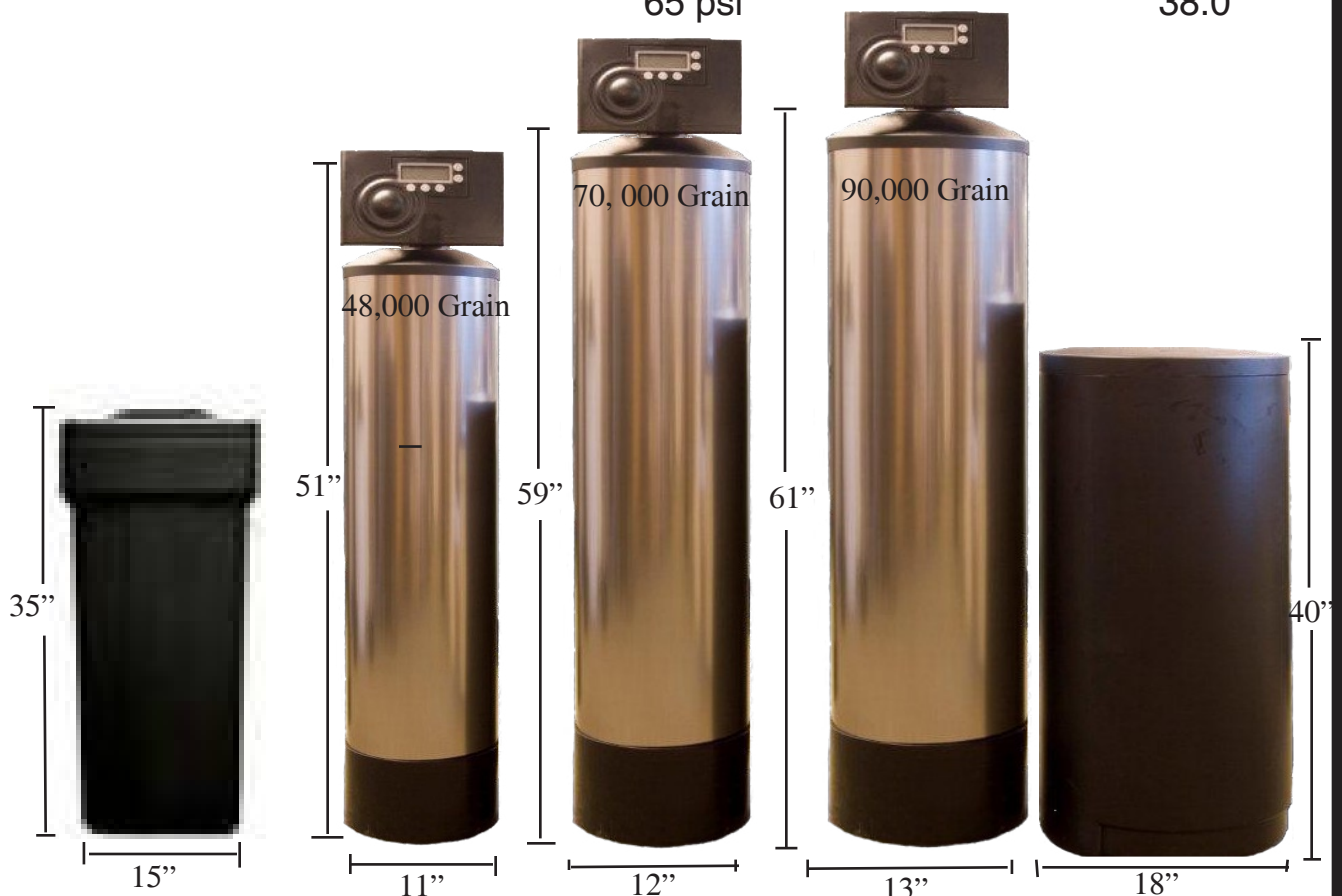
<i>Water Pressure</i>	<i>Flow Rate</i>
35 psi	13.3
45 psi	15.2
55 psi	16.4
65 psi	17.6

70,000 Grain

35 Psi	16.4
45 psi	20.1
55 psi	23.4
65 psi	24.5

90,000 Grain

35 psi	24.6
45 psi	28.4
55 psi	33.7
65 psi	38.0





MORRISON

EXSTREAM SERIES

WATER SOFTENING

Water Softener Savings Chart

	Monthly Cost*	Annual Cost*	% SAVED	Monthly Savings	Annual Savings
Plumbing and Appliances Replacement and repairs.	\$10.00	\$120.00	75%	\$7.50	\$90.00
Cooking and Coffee Tea, Sugar and Canning	\$9.83	\$118.00	25%	\$2.46	\$29.50
Clothing and Linens	\$50.00	\$600.00	30%	\$15.00	\$180.00
Energy Consumption (.06 KWH) Heat loss due to scale	\$26.67	\$320.00	20%	\$5.33	\$64.00
Soaps and Cleaning Aids Laundry, cleaning, dish washing, bathing, complexion, shaving, shampoo and rinse *10 or more hours of cleaning per month	\$86.00	\$1,032.00	80%	\$68.80	\$825.60
Totals	\$182.50	\$2190.00		\$99.09	\$1189.10

*Based on an average family of four with 10 gpg water hardness.

Compiled from the following sources: U.S. Department of Commerce, U.S. Department of Labor, National Industrial Conference Board, Water Conditioning Research Council, National Restaurant Association, American Laundry Institute, Orange County California Research Study, U.S. Bureau of Standards, University of Illinois, University of New Mexico.



Morrison ExStream Equipment is Manufactured and Warranted By Nugen Pure Water Systems.
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