



March 14, 2014

ECOWATER SYSTEMS  
ALAN GRAEBERT / MARGARET BICKING  
1890 WOODLANE DRIVE  
WOODBURY MN 55125

GENERAL ELECTRIC COMPANY  
c/o ECOWATER SYSTEMS LLC  
MARGARET BICKING  
1890 WOODLANE DRIVE  
WOODBURY MN 55125

Re: Description: WATER TREATMENT DEVICE - SOFTENER/CATION EXCHANGE  
Manufacturer: GENERAL ELECTRIC COMPANY  
Product Name: GENERAL ELECTRIC WATER SOFTENING SYSTEM  
Model Number(s): GXMH31H  
Product File No: 20140033

The specifications and/or plans for this plumbing product have been reviewed and determined to be in compliance with chapters SPS 382 through 384, Wisconsin Administrative Code, and Chapters 145 and 160, Wisconsin Statutes.

The Department hereby issues an approval based on the Wisconsin Statutes and the Wisconsin Administrative Code. This approval is valid until the end of March 2019.

This approval is contingent upon compliance with the following stipulation(s):

- This product has undergone sufficient testing to document the product's ability to reduce only those contaminants and/or substances as specified in this approval letter when the product is installed and maintained in strict accordance with the manufacturer's published instructions.
- Where the Department of Natural Resources (DNR) has jurisdiction, a written approval may be required prior to installation of this product in a water supply system to reduce the concentration of a contaminant that exceeds the primary drinking water standards contained in ch. NR 809, Wis. Admin. Code, the enforcement standards contained in ch. NR 140, Wis. Admin. Code, or for a water supply system that is subject to a written advisory opinion by the DNR. For more information contact the DNR Section of Private Water Systems, P.O. Box 7921, Madison, WI 53707, telephone (608) 267-9787.
- If this approved device is modified or additional assertions of function or performance are made, then this approval shall be considered null and void, unless the change is submitted to the department for review and the approval is reaffirmed.
- These cation exchange water softeners shall be sized, installed, programmed and maintained such that wastewater volumes, total dissolved solids and chloride discharges are minimized.
- At the time of installation, these devices shall be provided with an effective means to warn the users when they are not performing their function. This shall be accomplished by one of the following:
  1. sounding and alarm or flashing a light, each connected to an acceptable power source;
  2. providing a sampling kit for analysis of hardness or other appropriate contaminants; or
  3. providing a hardness monitor.

- The department does not recommend the use of water softeners for reducing dissolved iron concentrations in excess of 3.0 mg/l. This is because applying water softeners in this way sacrifices long-term water softener performance and efficiency. The use of water softeners for reducing dissolved iron concentrations exceeding 3.0 mg/l also generates excessive, and otherwise avoidable, quantities of chloride and dissolved solids which are subsequently discharged to ground and/or surface water supplies. Once present in ground and/or surface water supplies, chloride and dissolved solids tend to remain in the water resource and may travel great distances from the original point source. Presently, there are no economically viable methods to remove chloride and dissolved solids from water supplies because available technologies generate waste streams of their own, further concentrating the problem. It has been established by the Wisconsin Department of Natural Resources that chloride is chronically toxic to representative aquatic organisms, including forage and sport fish, at 395 mg/l, and acutely toxic at 757 mg/l.
- These devices are not approved for the reduction of bacterial, colloidal or organically bound forms of iron.

The water must be tested to speciate the iron present to determine if these devices can provide adequate treatment.

**WATER SOFTENING CAPABILITIES  
 PRODUCT FILE NUMBER 20140033  
 TABLE 1 OF 2**

Model Numbers	Capacity*						Max. Rated Service Flow
	Rating 1		Rating 2		Rating 3		
Metered	Grains	Pounds	Grains	Pounds	Grains	Pounds	gpm @ psig
GE							
GXMH31H	11,000	2.6	24,700	7.8	31,000	13.4	8.0 @ 6.5

Softener capacity ratings are based on grains of hardness, due to calcium and magnesium cations, removed (as calcium carbonate) while producing soft water between successive regenerations and are related to the pounds of salt required for each regeneration. The tests run to generate the hardness reduction data for table 1 were conducted in accordance with NSF Standard 44. **This device is efficiency rated (ER) at the lowest salt dosages displayed for each model (i.e. "Rating 1").**

These devices are approved for the reduction of dissolved iron, up to a maximum concentration of 3.0 mg/l. Each mg/l (ppm) of dissolved iron should be counted as 5.0 gpg when programming the hardness setting when programming the softener. The softener should not be operated in the ER mode if significant dissolved iron is present because this may lead to fouling of the resin bed.

**gpm** = gallons per minute

**1 grain per gallon (gpg)** = 17.1 milligrams per liter (mg/l)

**mg/l** = milligrams per liter, equivalent to ppm

**psig** = pounds per square inch – gauge

**1 grain** = 64.8 milligrams (mg)

Studies conducted on sulfonated poly-styrene di-vinyl benzene (SSDVBC) cation exchange media have documented that if hardness is reduced to less than 1.0 grain per gallon (17.1 mg/l), then barium and radium will also be effectively reduced. Thus, the capacity of these device for reducing barium and/or radium are based on the hardness reduction capacity ratings displayed above within the following ranges:

Contaminant	Influent Challenge Concentration (mg/l <sup>▲</sup> )	Maximum Allowable Product Water Concentration (mg/l <sup>▲</sup> )
Barium (Ba <sup>+2</sup> )	10.0 ± 10%	2.0
Radium (Ra <sub>226/228</sub> )	25.0 pCi/l	5.0 pCi/l

**▲** = unless otherwise indicated  
**pCi/l** = picocuries per liter

**mg/l** = milligrams per liter, equivalent to parts per million (ppm)  
**±** = plus or minus

**AESTHETIC CONTAMINANT REDUCTION CAPABILITIES**  
**PRODUCT FILE NUMBER 20140033**  
**TABLE 2 OF 2**

**Flow Rate:** 8.0 gallon per minute (gpm)  
**Capacity:** 570,000 gallons (gals.)

<b>Tested Contaminant</b>	<b>Influent Challenge (mg/l)*<sup>1</sup></b>
Chlorine (free)	2.0 ± 10%

**Other Conditions:** the contaminant reduction performance capabilities displayed for Table 2 of 2 were verified by testing conducted in accordance with NSF *International* Standard 42. To qualify for free chlorine reduction, the device must reduce the influent challenge concentrations by  $\geq 50\%$ ; meeting the free chlorine reduction requirements also qualifies the device for the reduction of aesthetic, organic, taste and odor reduction (e.g. geosmin, methylisoborneol); this does not include hydrogen sulfide.

<sup>1</sup> = milligrams per liter (mg/l) are equivalent to parts per million (ppm)  
± = plus or minus

$\geq$  = greater than or equal to  
\* = unless otherwise specified

The department is in no way endorsing this product or any advertising, and is not responsible for any situation which may result from its use.

Sincerely,

Glen W. Schlueter  
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Division of Industry Services  
Bureau of Technical Services  
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