SAFETY AND BUILDINGS DIVISION
Plumbing Product Review
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Wisconsin
Department of Commerce

Jim Doyle, Governor
Mary P. Burke, Secretary

September 21, 2005

ECOWATER SYSTEMS
SANDY GAMES
1890 WOODLANE DR
WOODBURY MN 55125

GENERAL ELECTRIC COMPANY
GE APPLIANCES
SANDY GAMES
APPLIANCE PARK AP35-1312
LOUISVILLE KY 40225

Re: Description: WATER TREATMENT DEVICE- SOFTENER
Manufacturer: GENERAL ELECTRIC COMPANY
Product Name: SMARTWATER WATER SOFTENING SYSTEM
Model Number(s): GXSH39E
Product File No: 20050665

The specifications and/or plans for this plumbing product have been reviewed and determined to be in compliance with chapters Comm 82 through 84, 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 September 2010.

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 manufacturers 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) 266-3415.

- 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.

Based on testing data submitted to and reviewed by the department, this approval recognizes that this plumbing product will reduce the concentration of contaminants as specified on pages 1 through 3 of this letter.

WATER SOFTENING CAPABILITIES
PRODUCT FILE NUMBER 20050665
TABLE 1 OF 2

Model Numbers	**Capacity***						
Metered	**Rating 1**		**Rating 2**		**Rating 3**		**Flow Rate**
SmartWater	**Grains**	**Pounds**	**Grains**	**Pounds**	**Grains**	**Pounds**	**gpm @ psig**
GXSH39E	11,700	2.3	30,800	8.5	39,000	14.7	10.0 @ 14

* The softener capacity rating is based on grains of hardness, due to calcium and magnesium cations, removed (as calcium carbonate) while producing soft water between successive regenerations and is 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. The tests run to support the dissolved iron reduction claim were conducted by WQA.

This device is also approved for the reduction of dissolved iron, up to a maximum concentration of 5.0 mg/l.

This device was tested under controlled laboratory, or field, conditions. The actual performance of this device for a specific end use installation will vary from the tested conditions based on local factors such as water pressure, water temperature and water chemistry.

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.

HEALTH EFFECTING INORGANIC CONTAMINANT REDUCTION CAPABILITIES
PRODUCT FILE NUMBER 20050665
TABLE 2 OF 2

Flow Rate: 37.9 liters per minute (lpm) @ 96.5 kilopascals (kPa)
[10.0 gallons per minute (gpm) @ 14 pounds per square inch gauge (psig)]
Capacity: see "other conditions" below the table

Tested Contaminant	**Tested Influent Concentration (mg/l)*[1]**
Barium [Ba^{+2} *(hardness surrogate)*]	10.0 ± 10%
Radium 226/228 (*hardness surrogate*)	25 pCi/l

Other conditions: the contaminant reduction capabilities displayed for table 2 of 2 were generated by testing conducted in accordance with NSF/ANSI Standard 44. 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), barium and radium will also be effectively reduced. Because 1.0 grain per gallon is also the end point for the capacity testing used to generate the capacity data in table 1 of 2 applies directly to barium and radium reduction as well, and, is ultimately a function of the actual onsite water hardness and salt setting of the individual softener.

1 = milligrams per liter (mg/l) are equivalent to parts per million (ppm)
≤ = less than or equal to
pCi/l = picocuries per liter
± = plus or minus
***** = unless otherwise indicated

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
Engineering Consultant-Plumbing Product Reviewer
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Safety and Buildings Division
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GWS:gws