SAFETY AND BUILDINGS DIVISION
Plumbing Product Review
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Wisconsin
Department of Commerce

Jim Doyle, Governor
Cory L. Nettles, Secretary

August 4, 2004

ECODYNE WATER SYSTEMS
MARGARET L. BICKING
PO BOX 64420
ST. PAUL MN 55164-0420

Re: Description: WATER TREATMENT DEVICE-REVERSE OSMOSIS
Manufacturer: ECODYNE WATER SYSTEMS
Product Name: WHIRLPOOL REVERSE OSMOSIS WATER FILTRATION SYSTEM
Model Number(s): WHER 18
Product File No: 20040181

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 August 2009.

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.

- For buildings not served by a municipal water supply, Department of Natural Resources (DNR) 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 these approved devices are 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.

- The system shall be provided with an in-line total dissolved solids (TDS) monitor, or other acceptable means, to warn the user when the system is not performing it's functions. Acceptable alternatives to an in-line TDS monitor include:

  1. terminating the discharge of treated water;

  2. sounding an alarm which is connected to acceptable power source;

  3. flashing a light connected to an acceptable power source;

  4. providing the user with an obvious, readily interpretable, indication of the system's ability to perform (e.g. decreasing the flow rate of treated water by 50% or more for systems making mechanical filtration claims);

  5. providing a sampling service by the manufacturer, either directly or through an authorized dealer, a minimum of once every six months;

(continued from previous page)

6. providing a sampling kit for analysis of TDS or other appropriate contaminants; or

7. providing a TDS monitor to measure the product water quality.

Whichever means of performance verification is selected, it shall be clearly described in the owner's manual for this device, and approved for use along with the device.

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 4 of this letter.

AESTHETIC CONTAMINANT REDUCTION CAPABILITIES
PRODUCT FILE NUMBER 20040181
TABLE 1 OF 3

Daily Production Rate: 84.0 liters per day (lpd) [22.0 gallons per day (gpd)]

Tested Contaminant	Average Influent Challenge (mg/l)[1]
Ammonia (NH_3^+)	2.5
Bicarbonate (HCO_3^-)	280
Bromide (Br^-)	11
Chlorine (free)	2.0 ± 10%
Chloride (Cl^-)	770
Magnesium (Mg^{+2})	31
Sodium (Na^+)	340
Sulfate (SO_4^{-2})	780
Tannin ($C_{76}H_{52}O_4$)	2.9
Total Dissolved Solids (NaCl surrogate)	750 ± 40
Zinc (Zn^{+2})	15.0

Other Conditions: the contaminant reduction performance capabilities displayed for Table 1 of 3 were verified by testing conducted in accordance with the testing *methodology* contained in NSF *International* Standard 58, with the exception of free chlorine and total dissolved solids which were fully tested and reported under NSF Standard 58. To qualify for free chlorine reduction, the device must reduce the influent challenge concentrations by ≥ 50%. To qualify for total dissolved solids (TDS) reduction, the device must reduce the influent challenge concentrations by ≥ 75%. The other contaminants displayed for Table 1 of 3 are not covered under NSF Standard 58; for ammonia the average effluent concentration was 0.24 mg/l (90% reduction), for bicarbonate the average effluent concentration was 10 mg/l (96% reduction), for bromide the average effluent concentration was 1.3 mg/l (89% reduction), for chloride that average effluent concentration was 60 mg/l (92% reduction), for magnesium the average effluent concentration was < 1.0 mg/l (97% reduction), for sodium the average effluent concentration was 40 mg/l (88% reduction), for sulfate the average effluent concentration was 12 mg/l (98% reduction), for tannin the average effluent concentration was 0.1 mg/l (97% reduction) and for zinc the average effluent concentration was 0.3 (98% reduction).

1 = milligrams per liter (mg/l) are equivalent to parts per million (ppm)
≥ = greater than or equal to
< = less than
± = plus or minus

HEALTH EFFECTING INORGANIC CONTAMINANT REDUCTION CAPABILITIES
PRODUCT FILE NUMBER 20040181
TABLE 2 OF 3

Daily Production Rate: 84.0 liters per day (lpd) [22.0 gallons per day (gpd)]

Tested Contaminant	Tested Influent Concentration (mg/l*)[1]
Arsenic (As^{+5})	0.30 ± 10%
Asbestos fibers (> 10μm in length)	$1 \times 10^7 – 1 \times 10^8$ F/l
Barium (Ba^{+2})	10.0 ± 10%
Cadmium (Cd^{+2})	0.03 ± 10%
Copper (Cu^{+2})†	3.0 ± 10%
Hexavalent Chromium (Cr^{+6})	0.15 ± 10%
Lead (Pb^{+2})	0.15 ± 10%
Nitrate (NO_3^-)	27.0 ± 10%
Nitrite (NO_2^-)	3.0 ± 10%
Radium 226/228 (*barium surrogate*)	25 pCi/L
Selenium (Se^{+4} and Se^{+6})	0.10 ± 10%
Trivalent chromium (Cr^{+3})	0.15 ± 10%

Other conditions: the contaminant reduction capabilities displayed for table 2 of 3 were generated by testing conducted in accordance with NSF *International* Standard 58. To qualify for arsenic reduction, the device must reduce the influent challenge concentrations such that all effluent concentrations are ≤ 0.010 mg/l. To qualify for barium reduction, the device must reduce the influent challenge water concentrations such that all effluent concentrations are ≤ 2.0 mg/l. To qualify for cadmium reduction, the device must reduce the influent challenge concentrations such that all effluent concentrations are ≤ 0.005 mg/l. To qualify for copper reduction, the device must reduce the influent challenge water concentrations such that all effluent concentrations are ≤ 1.3 mg/l. To qualify for chromium reduction (i.e. trivalent or hexavalent), the device must reduce the influent challenge concentrations such that all effluent concentrations are ≤ 0.1 mg/l. To qualify for lead reduction, the device must reduce the influent challenge concentrations such that all effluent concentrations are ≤ 0.010 mg/l. To qualify for nitrate/nitrite reduction, the device must reduce the influent challenge water concentrations, such that all effluent concentrations are ≤ 10.0 mg/l (as N), also, no more than 1.0 mg/l (as N) shall be in the form of nitrite. To qualify for radium reduction, the device must reduce the influent barium challenge concentrations such that all effluent concentrations are ≤ 2.0 mg/l (barium is used as a surrogate based on it's relationship with radium on the periodic table and the difficulty in using radium for routine testing). To qualify for selenium reduction, the device must reduce the influent challenge concentrations such that all effluent concentrations are ≤ 0.05 mg/l.

1 = milligrams per liter (mg/l) are equivalent to parts per million (ppm)
± = plus or minus
> = great than
≤ = less than or equal to
* = unless otherwise indicated
μm = micrometers
F/l = fibers per liter

HEALTH EFFECTING BIOLOGICAL CONTAMINANT REDUCTION CAPABILITIES
PRODUCT FILE NUMBER 20040181
TABLE 3 OF 3

Daily Production Rate: 84.0 liters per day (lpd) [22.2 gallons per day (gpd)]

Tested Contaminant	Influent Challenge (#/ml)
Cysts/Oocysts[1]	≥ 5.0×10^4

Other Conditions: the contaminant reduction performance capabilities displayed for Table 3 of 3 were verified by testing conducted in accordance with NSF *International* Standard 58. To qualify for cyst/oocyst reduction, the device must reduce the influent challenge concentrations by ≥ 99.95% at each sample point.

1 = the specific organisms covered under this testing protocol include cryptosporidium parvum, entamoeba histolytica, giardia lamblia and toxoplasma gondii
≥ = greater than or equal to
#/ml = particles per milliliter

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 is in no way endorsing this product or any advertising, and is not responsible for any situation that 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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