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

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WINDSOR WI 53598-9716

MARLO INCORPORATED
BOB HART
2227 SOUTH STREET
PO BOX 044170
RACINE WI 53404-7170

Re: Description: WATER TREATMENT DEVICE-REVERSE OSMOSIS
Manufacturer: MARLO INCORPORATED
Product Name: REVERSE OSMOSIS DRINKING WATER SYSTEM
Model Number(s): TFC-35 and TFC-35M
Product File No: 20040346

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 supercedes the approval issued on June 7, 2004 under product file number 20040232.

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;

(continued from previous page)

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

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 3 of this letter.

**HEALTH EFFECTING INORGANIC CONTAMINANT REDUCTION CAPABILITIES**
**PRODUCT FILE NUMBER 20040346**
**TABLE 1 OF 3**

**Product Water Production Rate:** 49.2 liters per day (lpd) [13.0 gallons per day gpd)]

| Tested Contaminant | Tested Influent Concentration (mg/l*)[1] |
|---|---|
| Arsenic ($As^{+5}$) | 0.30 ± 10% |
| Barium ($Ba^{+2}$) | 10.0 ± 10% |
| Cadmium ($Cd^{+2}$) | 0.03 ± 10% |
| Copper ($Cu^{+2}$) | 3.0 ± 10% |
| Fluoride ($F^{-1}$) | 8.0 ± 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 1 of 3 were generated by testing conducted in accordance with NSF/ANSI 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 fluoride reduction, the device must reduce the influent challenge concentrations such that all effluent concentrations are ≤ 1.5 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)
**≤** = less than or equal to
**±** = plus or minus
***** = unless otherwise indicated

**HEALTH EFFECTING BIOLOGICAL CONTAMINANT REDUCTION CAPABILITIES**
**PRODUCT FILE NUMBER 20040346**
**TABLE 2 OF 3**

**Product Water Production Rate:** 49.2 liters per day (lpd) [13.0 gallons per day gpd)]

| Tested Contaminant | Influent Challenge (#/ml) |
|---|---|
| Cysts/Oocysts[1] | ≥ $5.0 \times 10^4$ |

**Other Conditions:** the contaminant reduction performance capabilities displayed for Table 2 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

**AESTHETIC INORGANIC CONTAMINANT REDUCTION CAPABILITIES**
**PRODUCT FILE NUMBER 20040346**
**TABLE 3 OF 3**

**Product Water Production Rate:** 49.2 liters per day (lpd) [13.0 gallons per day gpd)]

| Tested Contaminant | Tested Influent Concentration (mg/l)[1] |
|---|---|
| Total Dissolved Solids (TDS) | 750 ± 40 |

**Other conditions:** the contaminant reduction capabilities displayed for table 3 of 3 were generated by testing conducted in accordance with NSF/ANSI Standard 58. To qualify, the device shall reduce the influent challenge concentrations by ≥ 75%.

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

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 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
Bureau of Integrated Services
Safety and Buildings Division
Department of Commerce
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