



Jim Doyle, Governor
Cory L. Nettles, Secretary

September 10, 2004

THE VORTEX CORPORATION
MICHELLE HUNNELL
400 PRESCOTT LAKES PKWY
PRESCOTT AZ 86301

Re: Description: WATER TREATMENT DEVICE-ACTIVATED CARBON
Manufacturer: THE VORTEX CORPORATION
Product Name: VORTEX WATER MACHINE
Model Number(s): UC-3 USING THE UC3-PB1 CARTRIDGE AND UC3-UVL LAMP
Product File No: 20040409

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 2009.

This approval supercedes the approval issued on April 11, 2002 under product file number 20010458.

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 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.

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 and tables 1 of 4 through 4 of 4.

**AESTHETIC CONTAMINANT REDUCTION CAPABILITIES
 PRODUCT FILE NUMBER 20040409
 TABLE 1 OF 4**

Flow Rate: 1.9 liters per minute (lpm) [0.5 gallon per minute (gpm)]
Capacity: 1,893 liters (l) [500 gallons (gals.)]

Tested Contaminant	Influent Challenge (mg/l) ¹
Chlorine (free)	2.0 ± 10%

Other Conditions: the contaminant reduction performance capabilities displayed for Table 1 of 4 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 ≥ 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.

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

**HEALTH EFFECTING INORGANIC CONTAMINANT REDUCTION CAPABILITIES
 PRODUCT FILE NUMBER 20040409
 TABLE 2 OF 4**

Flow Rate: 1.9 lpm (0.5 gpm)
Capacity: 1,893 l (500 gals.)

Tested Contaminant	Influent Challenge (mg/l) ¹
Lead (Pb ⁺²) ²	0.15 ± 10%

Other Conditions: the contaminant reduction performance capabilities displayed for Table 2 of 4 was verified by testing conducted in accordance with NSF *International* Standard 53. To qualify for Lead reduction, the device must reduce the influent challenge concentrations so that all effluent concentrations are ≤ 0.010 mg/l.

1 = milligrams per liter (mg/l) are equivalent to parts per million (ppm)
 2 = metals are tested at pH 6.5 and pH 8.5
 ≤ = less than or equal to
 ± = plus or minus

**HEALTH EFFECTING BIOLOGICAL CONTAMINANT REDUCTION CAPABILITIES
 PRODUCT FILE NUMBER 20040409
 TABLE 3 OF 4**

Flow Rate: 1.9 lpm (0.5 gpm)
Capacity: dependent on the type and quantity of particulate matter present in the influent water; the need for maintenance may be indicated by a significant decrease in flow rate.

Tested Contaminant	Influent Challenge (#/ml)
Cysts/Oocysts ¹	≥ 5.0 x 10 ⁴

Other Conditions: the contaminant reduction performance capabilities displayed for Table 3 of 4 were verified by testing conducted in accordance with NSF *International* Standard 53. 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
 #/ml = particles per milliliter
 ≥ = greater than or equal to

**AESTHETIC BIOLOGICAL CONTAMINANT REDUCTION CAPABILITIES
PRODUCT FILE NUMBER 20040409
TABLE 4 OF 4**

Flow Rate: 1.9 lpm (0.5 gpm)

Lamp Replacement Interval: 8,000 hours, 10,000 on/off cycles, which ever occurs first.

Tested Contaminant	Influent Challenge (cells/ml)
Saccharomyces cerevisiae (ATCC# 18824)	1.0×10^4 to 1.0×10^5

Other Conditions: the contaminant reduction performance capabilities displayed for Table 4 of 4 were verified by testing conducted in accordance with NSF *International* Standard 55. To qualify for NSF Standard 55, Class B designation, the geometric mean of all *S. cerevisiae* counts on influent samples minus the geometric mean of counts on all effluent samples shall demonstrate a log reduction \geq the reduction caused by a U.V. dose of 16 mJ was achieved, as calibrated in accordance with annex B of NSF Standard 55. This device is approved for the supplemental bactericidal treatment of either treated and disinfected public drinking water, or other drinking water that has been tested and deemed acceptable for human consumption by the state or local health agency having jurisdiction. This device is designed to reduce naturally occurring non-pathogenic or nuisance bacteria only. This device is not intended for the treatment of microbiologically unsafe water or water of unknown quality. This device will provide a U.V. dose of 16 mJ at 70% of the U.V. lamps normal output.

cells/ml = particles per milliliter

\geq = greater than or equal to

mJ = millijoules

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
Bureau of Integrated Services
Safety and Buildings Division
Department of Commerce
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GWS:gws