



Water Purification Systems

PuraVida h2o products are multi-stage filtration and purification systems. These systems are designed to operate using municipal water supplies. The systems are capable of absorbing or rejecting nearly all contamination. In addition these Water Stations have UV illumination or Ozone sterilization systems within them providing a biological barrier. The Pura Vida h2o products provide increased protection against any contamination or biological threat that may be in the existing water supply, protecting the public while also reducing carbon footprint by providing an alternate for bottled water.

The multi-filtration process consists of the following stages:

- Sediment filter
- Solid Block Carbon filter
- Reverse Osmosis
- Ultraviolet Lamp

The process starts with a sediment filter used to reduce the solids that are not dissolved within the water. These filters are usually about 1 microns (the human hair is about 70 microns). The primary objective in this stage is to provide the lowest amount of particles that pass through so that the next stage, carbon filtration, can remove contamination.

The carbon filter acts in two ways, first it acts as a filter removing any remaining particles while the second stage removes contamination. The effectiveness of Carbon to absorb contamination is identified as an ultra-filtration filter which has a pore size of approximately 0.01 micron. The Center for Disease Control has provided guidelines based upon the filtration type and the size of the filter. This information has been attached for review and reference. Carbon is effective in providing clean pure water by absorbing over 97.5 % of most contaminants and is the first stage of a redundant purification process designed into these water stations.

The next step in the process is reverse osmosis. Reverse Osmosis is the most effective way to remove

contamination and biological threats. Reverse osmosis (RO) is a filtration method that removes many types of large molecules and ions from water by applying pressure to the water when it is on one side of a selective membrane. The result is that the solute is retained on the pressurized side of the membrane and the pure water is allowed to pass to the other side. The Pura Vida h2o Water Stations have large RO units which will reject any contaminants.

According to The Center for Disease Control the Reverse Osmosis Systems have a very high effectiveness in removing bacteria (for example, Campylobacter, Salmonella, Shigella, E. coli) It is very important to understand that the water systems that Pura Vida h2o utilize are redundant safe filtration systems that are effective in removing harmful contaminants and biological treats.

As a final stage, the Pura Vida h2o systems use either an active ozonation or UV light process to sanitize the water prior to dispensing. This removes any biological activity that may have been present after the purification process. According to the CDC these processes are effective in removing, protozoa, bacteria and removing viruses from the water.

Through a comprehensive consensus process, the NSF Joint Committee on Drinking Water Treatment Units has developed key standards for evaluation and certification of drinking water treatment units. These include:

NSF/ANSI Standard 42: Drinking Water Treatment Units - Aesthetic Effects

Overview: This standard covers point-of-use (POU) and point-of-entry (POE) systems designed to reduce specific aesthetic or non-health-related contaminants (chlorine, taste and odor, and particulates) that may be present in public or private drinking water.

NSF/ANSI Standard 53: Drinking Water Treatment Units - Health Effects

Overview: Standard 53 addresses point-of-use (POU) and point-of-entry (POE) systems designed to reduce specific health-related contaminants, such as *Cryptosporidium*, *Giardia*, lead, volatile organic chemicals (VOCs), MTBE (methyl tertiary-butyl ether), that may be present in public or private drinking water.

NSF/ANSI Standard 55: Ultraviolet Microbiological Water Treatment Systems

Overview: This standard establishes requirements for point-of-use (POU) and point-of-entry (POE) non-public water supply (non-PWS) ultraviolet systems and includes two optional classifications. Class A systems (40,000 uwsec/cm²) are designed to disinfect and/or remove microorganisms from contaminated water, including bacteria and viruses, to a safe level. Class B systems (16,000 uwsec/cm²) are designed for supplemental bactericidal treatment of public drinking water or other drinking water, which has been deemed acceptable by a local health agency.

Figure 1: Reduction claims for filters

The system conforms to ANSI/NSF 42 and 53 for the specific performance claims as verified and substantiated by test data. The system has been tested according to ANSI/NSF 42 and 53 for reduction of substances listed below. The concentration of the indicated substances in water entering the system was reduced to a concentration less than or equal to the permissible limit for water leaving the system, as specified in ANSI/NSF 42 and 53.

DATA SHEET REDUCTION CLAIMS

ANSI/NSF STANDARD 42

CARBON FILTER TESTED: Lead/Cyst

Substance	Influent challenge concentration	Avg. % Rej.	Reduction requirement
Chlorine	2.0 mg/L \pm 10%	\geq 97.5	\geq 50%
Particulate, Class I particles 0.5 μ m to $<$ 1 μ m	At least 10,000 particles/ml	99.6	\geq 85%

ANSI/NSF STANDARD 53

CARBON FILTER TESTED: Lead/Cyst

Substance	Influent challenge Concentration mg/L	Avg. % Rej.	Maximum permissible product water concentration mg/L
Turbidity	11 \pm 1 NTU	97.7	0.5 NTU
Lead	0.15 \pm 10%	$>$ 99	0.010
VOC	Refer to pages iv and v for individual contaminant performance data.		

Substance	Influent challenge concentration	Avg. % Rej.	Reduction Requirement
Cysts	Min. 50,000/L	99.99	99.95%
NOTE: Certification for Cysts reduction includes Cryptosporidium and Giardia lamblia.			

OUTPUT PERFORMANCE

RATED AT CONTAMINANT REDUCTION TEST PARAMETERS

SERVICE FLOW RATE AND CAPACITY
1.7 Liters/minute (0.45 gallon/minute) Actual rate varies according to water pressure.

NOTES:

- a) Testing was performed under standard laboratory conditions. System performance may vary according to local water conditions.
- b) Contaminants listed in this Data Sheet are not necessarily in your water.
- c) We recommend your water be tested to determine treatment requirements.
- d) Cooler electrical requirements are 115VAC \pm 10%, 1 phase, 60 Hertz for models without 'Y' on descriptor end. Model names ending in 'Y' require 220-240 Volt, 1 phase, 50/60 Hertz.

Figure 2: Volatile Organic Chemicals

VOLATILE ORGANIC CHEMICALS/VOC's

NOTE: Volatile Organic Chemicals (VOC's) are synthetic chemicals that readily vaporize at room temperature.

CARBON FILTERS TESTED: 1m Extruded carbon, Lead/Cyst

Substance	Influent challenge concentration mg/L	Maximum permissible product water concentration mg/L	Drinking water regulatory level ¹ (MCL/MAC) mg/L
Alachlor	0.050	0.001	0.002
Atrazine	0.100	0.003	0.003
Benzene	0.081	0.001	0.005
Carbofuran	0.190	0.001	0.040
Carbon Tetrachloride	0.078	0.0018	0.005
Chlorobenzene	0.077	0.001	0.100
Chloropicrin	0.015	0.0002	---
2,4-D	0.110	0.0017	0.070
Dibromochloropropane (DBCP)	0.052	0.00002	0.0002
o-Dichlorobenzene	0.080	0.001	0.600
p-Dichlorobenzene	0.040	0.001	0.075
1,2-Dichloroethane	0.088	0.0048	0.005
1,1-Dichloroethylene	0.083	0.001	0.007
Cis-1,2-Dichloroethylene	0.170	0.0005	0.070
Trans-1,2-Dichloroethylene	0.086	0.001	0.100
1,2-Dichloropropane	0.080	0.001	0.005
Cis-1,3-Dichloropropylene	0.079	0.001	---
Dinoseb	0.170	0.0002	0.007
Endrin	0.053	0.00059	0.002
Ethylbenzene	0.088	0.001	0.700
Ethylene Dibromide (EDB)	0.044	0.00002	0.00005
Haloacetonitriles (HAN):			
Bromochloroacetonitrile	0.0022	0.0005	
Dibromoacetonitrile	0.024	0.0006	---
Dichloroacetonitrile	0.0096	0.0002	
Trichloroacetonitrile	0.0015	0.0003	
Haloketones (HK):			
1,1-dichloro-2-propanone	0.0072	0.0001	---
1,1,1-trichloro-2-propanone	0.0082	0.0003	
Heptachlor	0.080	0.0004	0.0004
Heptachlor epoxide	0.0107	0.0002	0.0002
Hexachlorobutadiene	0.044	0.001	---
Hexachlorocyclopentadiene	0.060	0.000002	0.050
Lindane	0.055	0.00001	0.0002
Methoxychlor	0.050	0.0001	0.040
Pentachlorophenol	0.096	0.001	0.001
Simazine	0.120	0.004	0.004
Styrene	0.150	0.0005	0.100

Figure 3: Volatile Organic Chemicals - Continued

VOLATILE ORGANIC CHEMICALS/VOC's (continued)

Substance	Influent challenge concentration mg/L	Maximum permissible product water concentration mg/L	Drinking water regulatory level¹ (MCL/MAC) mg/L
1,1,2,2-tetrachloroethane	0.081	0.001	---
Tetrachloroethylene	0.081	0.001	0.005
Toluene	0.078	0.001	1.000
2,4,5-TP (silvex)	0.270	0.0016	0.050
Tribromoacetic acid	0.042	0.001	---
1,2,4-Trichlorobenzene	0.160	0.0005	0.070
1,1,1-Trichloroethane	0.084	0.0046	0.200
1,1,2-Trichloroethane	0.150	0.0005	0.005
Trichloroethylene	0.180	0.001	0.005
Trihalomethanes (includes): Chloroform (surrogate chemical) Bromoform Bromodichloromethane Chlorodibromomethane	0.300	0.015	0.080
Xylenes (total)	0.070	0.001	10

Notes

1. These harmonized values were agreed upon by representatives of USEPA and Health Canada for the purpose of evaluating products to the requirements of ANSI/NSF Standard 53.
2. Influent challenge levels are average influent concentrations determined in surrogate qualification testing.
3. Maximum permissible product water concentration was not observed but was set at the detection limit of the analysis.
4. Maximum permissible product water concentration is set at a value determined in surrogate qualification testing.
5. Maximum permissible product water level calculated at chloroform 95% breakthrough point as determined in surrogate qualification testing.
6. The surrogate test results for heptachlor epoxide demonstrated a 98% reduction. These data were used to calculate an upper occurrence concentration, which would produce a maximum product water level at the MCL.

TESTED AND CERTIFIED TO ANSI/NSF® 42 & 53 FOR SPECIFIC CONTAMINANT CLAIMS AS VERIFIED AND SUBSTANTIATED BY TEST DATA

Figure 4: Reverse Osmosis Performance

substances in water entering the system was reduced to a concentration less than or equal to the permissible limit for water leaving the system, as specified in ANSI/NSF 58.

MEMBRANE TYPE: Thin Film Composite

Substance	Influent challenge concentration mg/L	Avg. % Rej.	Maximum permissible product water concentration mg/L
Arsenic (pentavalent)	0.30 ± 10%	99.3	0.010
Barium	10.0 ± 10%	98	2.0
Cadmium	0.03 ± 10%	98	0.005
Chromium (hexavalent)	0.3 ± 10%	94	0.1
Lead	0.15 ± 10%	99.2	0.010
Radium 226/228	25 pCi/L ± 10%	80	5 pCi/L
Total dissolved solids	750 ± 40	96	187
Turbidity	11 NTU ± 1	>99.5	0.5 NTU

Substance	Influent challenge concentration	Avg. % Rej.	Reduction Requirement
Cysts	Minimum 50,000/ml	>99.99	99.95%

NOTE: Certification for Cyst Reduction includes Cryptosporidium and Giardia lamblia

NOTES:

1. Barium used as surrogate for Radium under NSF® protocols.
2. This system has been tested for the treatment of water containing pentavalent arsenic (also known as As(V), As(+5), or arsenate) at concentrations of 0.30 mg/L or less. This system reduces pentavalent arsenic, but may not remove other forms of arsenic. This system is to be used on water supplies containing a detectable free chlorine residual at the system inlet or on water supplies that have been demonstrated to contain only pentavalent arsenic. Treatment with chloramine (combined chlorine) is **not** sufficient to ensure complete conversion of trivalent arsenic to pentavalent arsenic. Please see the Arsenic Facts section below for further information.

COMMENTS:

- a) Testing was performed under standard laboratory conditions. System performance may vary according to local water conditions.
- b) Contaminants listed on this page are not necessarily in your water.
- c) This reverse osmosis system contains a replaceable component critical to the efficiency of the system. Replacement of the reverse osmosis component should be with one of identical specifications, as defined by the manufacturer, to assure the same efficiency and contaminate reduction performance.
- d) We recommend your water be tested to determine requirements.
- e) Cooler electrical requirements are 115VAC ±10%, 1 phase, 60 Hertz for models without 'Y' on descriptor end. Model names ending in 'Y' require 220-240 Volt, 1 phase, 50/60 Hertz.

Terms

Carbon Filtration

Activated carbon (AC) filtration is most effective in removing organic contaminants from water. Organic substances are composed of two basic elements, carbon and hydrogen. Because organic chemicals are often responsible for taste, odor, and color problems, AC filtration can generally be used to improve aesthetically objectionable water. AC filtration will also remove chlorine. AC filtration is recognized by the Water Quality Association as an acceptable method to maintain certain drinking water contaminants within the limits of the EPA National Drinking Water Standards.

Center for Disease Control Guidelines

Filtration

Filtration is a physical process that occurs when liquids, gases, dissolved or suspended matter adhere to the surface of, or in the pores of, an absorbent medium.

Filtration of contaminants depends highly on the amount of contaminant, size of the contaminant particle, and the charge of the contaminant particle. Depending on the household water needs, pretreatment before filtration may include the addition of coagulants and powdered activated carbon, adjustments in pH or chlorine concentration levels, and other pretreatment processes in order to protect the filter membrane surface.

Ultrafiltration

(Carbon Filter)

- An ultrafiltration filter has a pore size of approximately 0.01 micron (pore size ranges vary by filter from 0.001 micron to 0.05 micron; Molecular Weight Cut Off (MWCO) of 13,000 to 200,000 Daltons). Ultrafiltration filters remove particles based on size, weight, and charge;
- Ultrafiltration has a very high effectiveness in removing protozoa (for example, Cryptosporidium, Giardia);
- Ultrafiltration has a very high effectiveness in removing bacteria (for example, Campylobacter, Salmonella, Shigella, E. coli);
- Ultrafiltration has a moderate effectiveness in removing viruses (for example, Enteric, Hepatitis A, Norovirus, Rotavirus);
- Ultrafiltration has a low effectiveness in removing chemicals.

Reverse Osmosis Systems

Reverse Osmosis Systems use a process that reverses the flow of water in a natural process of osmosis so that water passes from a more concentrated solution to a more dilute solution through a semi-permeable membrane. Pre- and post-filters are often incorporated along with the reverse osmosis membrane itself.

- A reverse osmosis filter has a pore size of approximately 0.0001 micron.

- Reverse Osmosis Systems have a very high effectiveness in removing protozoa (for example, Cryptosporidium, Giardia);
 - Reverse Osmosis Systems have a very high effectiveness in removing bacteria (for example, Campylobacter, Salmonella, Shigella, E. coli);
 - Reverse Osmosis Systems have a very high effectiveness in removing viruses (for example, Enteric, Hepatitis A, Norovirus, Rotavirus);
 - Reverse Osmosis Systems will remove common chemical contaminants (metal ions, aqueous salts), including sodium, chloride, copper, chromium, and lead; may reduce arsenic, fluoride, radium, sulfate, calcium, magnesium, potassium, nitrate, and phosphorous.
- Ultraviolet Treatment Systems (with pre-filtration)

Ultraviolet Treatment Systems (with pre-filtration)

- Ultraviolet Treatment with pre-filtration is a treatment process that uses ultraviolet light to disinfect water or reduce the amount of bacteria present.
- Ultraviolet Treatment Systems have a very high effectiveness in removing protozoa (for example, Cryptosporidium, Giardia);
- Ultraviolet Treatment Systems have a very high effectiveness in removing bacteria (for example, Campylobacter, Salmonella, Shigella, E. coli);
- Ultraviolet Treatment Systems have a high effectiveness in removing viruses (for example, Enteric, Hepatitis A, Norovirus, Rotavirus);
- Ultraviolet Treatment Systems are not effective in removing chemicals.