



## **UV Purification**

Fresh water is one of our most valuable natural resources. Unfortunately, it is extremely difficult to know whether our water is contaminated.

This is because microorganisms naturally exist on all surfaces exposed to air, including water. Many of these microbes have the potential to cause disease. The term for these disease-carrying microbes is pathogens.

In order to destroy harmful pathogens, water must be disinfected. One process that aids in disinfection is Ultraviolet (UV) purification.

UV purification is a highly effective and acceptable means of disinfecting water to meet the microbiological requirements of the Public Health Service Drinking Water Standards.

### **How UV purification works**

Water enters the purifier's chamber. Once inside, it is exposed to UV light. The UV lamp used for this type of germicidal disinfection produces light at a wavelength of 253.7 nanometers (2,537 Angstrom units). At this wavelength, UV light destroys up to 99.9% of all bacteria, protozoa, viruses, molds, algae, and other microbes. This includes such waterborne diseases as: E.coli, hepatitis, cholera, dysentery, typhoid fever as well as many others.

The actual lamp(s) is housed in a quartz sleeve. This sleeve not only helps maintain maximum operating temperature, but also prevents the lamp from coming in contact with the water.

While in the chamber, the water receives doses of UV energy. To be effective, a minimum dosage of 16,000 microwatt second per square centimeter is applied.

Since the treatment does not change either physical or chemical properties, the water is ready for use when it leaves the purifying unit.

## **Advantages**

There are many advantages to this type of purification: no need for toxic and expensive chemicals, fast treatment, low maintenance, simple handling and extremely low cost operation.

This proven technology is not only extremely reliable, but is scalable to treat millions of gallons per day.

Once installed, the units will only need periodic cleaning and annual lamp replacement.

## **Applications**

UV disinfection has worked successfully in the following applications:

- Drinking water
- Septic systems
- Pool and spas
- Fish hatcheries
- Ranches for livestock
  - Hospitals
- Beverage and bottling
  - Laboratories
  - Food processing
- Wastewater plants
- Semiconductor and electronics

While UV purification is well suited for many residential, commercial, industrial and municipal water and wastewater treatment applications, it is important to know about the water quality and about the desired end results.

UV purifiers work best when the water temperature is between 35-110 degrees Fahrenheit. Extreme cold or heat will interfere with the purifier's performance.

One must also look for situations that inhibit UV light from penetrating the water. Turbidity --- the state of water when it is cloudy from having sediment stirred up --- will interfere with the transmission of UV energy and decrease the disinfection efficiency.

In cases where the water has high iron or manganese content, is cloudy or has other organic impurities, it may be necessary to pre-treat the water before it enters the UV disinfection stage. UV purification works well in conjunction with carbon filtration, reverse osmosis and with certain chemicals.

Once these issues have been addressed, UV disinfection will be effective in destroying microorganisms.