

TOTAL WATER SOLUTIONS CC

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UV DISINFECTION

Of all the available systems of water purification in the world today, the most COMPREHENSIVE, most EFFECTIVE, most SAFE and most RELIABLE is the Ultraviolet (UV) system of water disinfection. Chlorination and other chemical disinfection techniques, once assumed to be safe and harmless, are now known to have long term damaging effects on the human body. There are no residues left by Ultraviolet Light System, whose effectiveness has been improved with the development of more intense Ultraviolet Lamps.

GENERAL DESCRIPTION ULTRAVIOLET SYSTEMS

Ultraviolet rays are part of the light that comes from the sun. UV is known to be an effective disinfectant due to its strong germicidal (inactivating) ability. UV has been used commercially for many years in the pharmaceutical, cosmetic, beverage and electronic industries. It was used for drinking water disinfection in the early 1900's but was abandoned due to high operating cost, unreliable equipment, and the expanding popularity of disinfection by chlorination.

Recently, the safety of chlorination has been questioned and UV has experienced increased acceptance in both municipal and household systems. There are few large-scale UV water treatment plants in the United States although there are more than 2,000 such plants in Europe. Municipal systems use UV in conjunction with chlorine, thus reducing the amount of chlorine for disinfection.

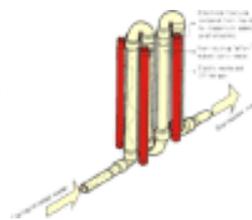
UV radiation has disinfection properties that inactivate bacteria, viruses, spores, cysts etc. UV is effective only if the light intensity reaches the organism in question, therefore nothing should be present in the water that shields the organism from radiation.

PRINCIPLES OF UV DISINFECTION

UV radiation has three wave length zones: UV- A, UV- B and UV- C. It is the short wave UV- C that has germicidal properties for disinfection. A low-pressure mercury lamp produces the UV light in the range of 254 Nanometers (nm). An nm is one billionth of a meter (10^{-9} meter). 254 nm is the most effective on microorganisms and hence it is perfect for germicidal activity. There are UV lamps that produce radiation in the range of 185 nm that are effective on micro organisms and will also reduce the Total Organic Carbon (TOC) content of the water.

In a typical UV system, approximately 95% of the radiation passes to a special quartz glass sleeve and into the untreated water. Used alone, UV radiation does not improve the taste, odour, or clarity of water. There is no residual disinfection in the water to inactivate bacteria that may be introduced after the water passes the UV chamber. The percentage of microorganisms destroyed depends on the intensity of the UV light and the contact time. If material builds up on the quartz sleeve (fouling), the light intensity and the effectiveness of UV is reduced.

Our unit has none of the disadvantages of earlier ultraviolet systems, because water flows through special quality Teflon[®] tubes, and eliminates fragile quartz tubes and all their disadvantages. A special **Flow Pattern** through the Teflon[®] tubes assures full exposure to the ultraviolet rays. Non wetting surface characteristics of Teflon[®] also eliminate any build up of contaminants that could block ultraviolet rays i.e. there is no fouling occurring in the system.



OUR SYSTEM provides a cost effective, simple solution to fluid quality problems. With a Teflon[®] based system, the fluid flows through Teflon[®] tubes with germicidal UV Lamps placed outside the tubes. Ultraviolet rays pass through the UV transmitting Teflon[®] tubes into the fluid and disinfects it.

Comparison table of different disinfection methods

Particulars	Chlorination	Ozone	Ultraviolet
Disinfection	Chemical	Chemical	Physical
Capital Investment	Medium	High	Low
Operating Cost	Medium	High	Low
Maintenance Cost	Medium	High	Low
Disinfection Performance	Very Good	Satisfactory	Excellent
Contact Time	30-45 minutes	6-10 minutes	2-6 seconds
Personnel Hazards	High	High	Low
Toxic Chemicals	Yes	Yes	No
Water Chemistry Change	Yes	Yes	No
Residual Effect	Yes	Yes	No

