TECHNICAL DATA SHEET 2004

WATER DISINFECTION USING ULTRA VIOLET LIGHT

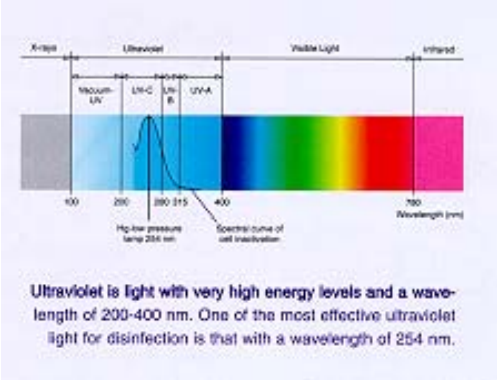
BEACON WATER TREATMENTS LIMITED

WATER DISINFECTION USING ULTRA VIOLET LIGHT

Approximately 100 years ago chlorine was first used to disinfect water, guarding against the spread of water borne disease. This led to the wide use of chemicals for water treatment. Present-day scientific research however, shows that these processes can have a harmful effect on health and the environment.

The main concern with chemical treatment is the formation of disinfection by-products that are left behind in the water. In particular, chlorine is suspected to increase the levels of carcinogenic substances as a result of reactions with organic material in the water.

During the early days of water treatment, scientists discovered that in nature the sun was responsible for natural control of bacteria in rivers and lakes.



Ultraviolet is light with very high energy levels and a wavelength of 200-400 nm. One of the most effective ultraviolet light for disinfection is that with a wavelength of 254 nm.

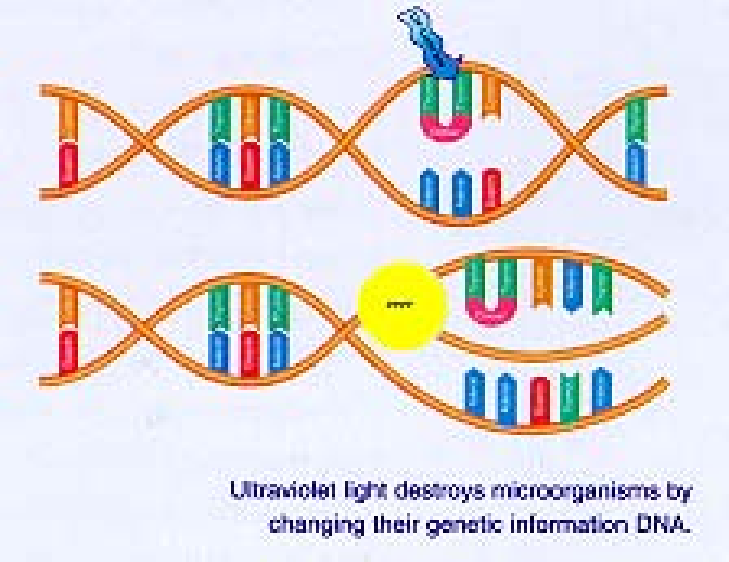
Ultra Violet Systems are designed to reproduce the power of the sun, producing ultra violet rays to destroy pathogenic micro-organisms within a matter of seconds.

HOW IT WORKS

Ultra Violet disinfection is a non-chemical treatment, destructive to all micro-organisms.

Ultra Violet light with a wavelength of 254 nm is the most effective range for disinfection, often referred to as the "Germicidal Range".

The Ultra Violet light penetrates the outer cell membrane of the organism, passing through the cell body, where it dissociates the DNA (deoxyribonucleic acid) structure of the organism, thus preventing further multiplication.


Ultraviolet light destroys microorganisms by changing their genetic information DNA.

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ADVANTAGES OF UV SYSTEMS

- **Simple Application -** UV Systems are supplied with standard fittings, either BSP or Flanged connections, depending on the system selected. (Hygienic fittings are also available on selected models – see specification)
- **Reliable Disinfection -** All systems are sized on their performance at the end of lamp life, thus ensuring complete disinfection during the service life of the lamps, typically 8,000 to 10,000 hours.
- **No formation of by-products -** UV disinfects the water without the addition of chemicals or other compounds.
- **Monitoring -** UV Systems have a wide range of monitoring options available. Please refer to technical specification for further details.
- **Lamps -** The Spectrotherm high intensity, low-pressure lamps have excellent temperature stability, thus giving extended quartz sleeve and lamp life. Lamp life 8,000 to 10,000 hours (depending on system selected).

TYPICAL APPLICATIONS

- **Drinking Water -** The most common application for UV Disinfection covering municipal, bottled, and private drinking waters.
- **Process Water -** The use of UV in process applications include the following:-
  - Beverage and food production.
  - Pharmaceutical and ultra pure water.
  - Manufacture of body care products
  - Ozone destruction in pharmaceutical and process water.
- **Building Services -**
  - Disinfection of drinking water at point of use.
  - Prevention of Legionella in warm water systems.
  - Storage tank disinfection including headspace.
- **Swimming Pool and Water Features**

For more information, please contact us at:

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UV DISINFECTION UNITS – SPECIFICATION

UV Model	Flow m^3/hr	Connections	Lamp Power Watts	Lamp Life Months	Chamber Material	Lamp Failure Hrs Run	UV Monitor	Wiper	Sanitary & FDA Validation	Stainless Steel Panel
Aquada 1	0.9	½" BSPM	16.5	12	304 SS	Optional	Optional	N/A	N/A	N/A
Aquada 2	2.25	¾" BSPM	40	12	304 SS	Optional	Optional	N/A	N/A	N/A
Aquada 4	4.0	¾" BSPM	40	12	304 SS	Optional	Optional	N/A	N/A	N/A
Aquada 7	7.1	1" BSPM	84	12	316 SS	Optional	Optional	N/A	N/A	N/A
Aquada 10	10	1 ½" BSPM	84	12	316 SS	Optional	Optional	N/A	N/A	N/A
WWMG-15	0.5	1" BSPM	15	12	316L SS	Standard	Optional	N/A	N/A	N/A
WWGK- 15	0.8	2" BSPM	15	12	316L SS	Standard	Optional	N/A	N/A	N/A
WWMG-30	1.0	1" BSPM	30	12	316L SS	Standard	Optional	N/A	N/A	N/A
WWGK-30	1.6	2" BSPM	30	12	316L SS	Standard	Optional	N/A	N/A	N/A
WWMG-55	1.8	1" BSPM	55	12	316L SS	Standard	Optional	N/A	N/A	N/A
WWGK-55	30	2" BSPM	55	12	316L SS	Standard	Optional	N/A	N/A	N/A
WWMG-75	2.7	2" BSPM	75	12	316L SS	Standard	Optional	N/A	N/A	N/A
WWGK-75	4.2	2" BSPM	75	12	316L SS	Standard	Optional	N/A	N/A	N/A

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WWL-15-2	0.5	1” BSPM *	15	12	316L SS	Standard	Optional	N/A	Optional	N/A
WWL-15-4	1.2	2” BSPM *	30	12	316L SS	Standard	Optional	N/A	Optional	Optional
WWL-30-2	1.0	1” BSPM *	30	12	316L SS	Standard	Optional	N/A	N/A	Optional
WWL-30-4	2.7	2” BSPM *	30	12	316L SS	Standard	Optional	N/A	Optional	Optional
WWL-55-2	1.8	1” BSPM *	55	12	316L SS	Standard	Optional	N/A	N/A	Optional
WWL-55-4	4.4	2” BSPM *	55	12	316L SS	Standard	Optional	N/A	Optional	Optional
WWL-75-4	6.5	2” BSPM *	75	12	316L SS	Standard	Optional	N/A	Optional	Optional
WWL-200-4	18	2” BSPM *	200	12	316L SS	Standard	Optional	N/A	Optional	Optional
WWL-200-6	30	3” BSPM *	200	12	316L SS	Standard	Optional	N/A	Optional	Optional
WWL-200-8	35	3” BSPM *	200	12	316L SS	Standard	Optional	N/A	Optional	Optional

* Available with Triclamp, ANSI, ISS etc Connections
Flow rates assume UV transmission of 95% $300J/m^2$