

The following information was published by Water Technology, May, 2003
in an article by Aquafine Corp. titled, "Eliminating residual
chlorine/chloramines using UV radiation.

Understanding UL Light

Ultraviolet energy is found in electromagnetic spectrum between visible light and X-rays. The UV region of the electromagnetic spectrum encompasses a range from 400 nanometer (nm) through 100 nanometer and is further sub-divided into four smaller regions:

UV-A (Long-wave UV)	315 – 400 nm
UV-B (Medium-wave UV)	280 – 315 nm
UV-C (Short-wave UV)	200 – 280 nm
Vacuum UV	100 – 200 nm

Two different UV wavelengths are employed in water treatment – the 254 nm and the 185 nm.

The 254 nm ($1 \text{ nm} = 10^{-9} \text{ m} = 10 \text{ \AA}$) UV light – also called the germicidal light due to its unique ability to destroy microorganisms – is employed in disinfection and ozone destruction applications. It penetrates the outer cell wall of the microorganism, passes through the cell body, reaches the DNA (deoxyribonucleic acid) and alters the genetic material.

The microorganisms are destroyed in a non-chemical manner.

The 254 nm UV light can also destroy residual ozone present in a water stream.

The 185 nm UV light used in TOC reduction application decomposes the organic molecules. The 185 nm light carries more energy than the 254 nm light, and it generates hydroxyl (OH) free radicals from water molecules.