



**APPLICATION:** TOC Reduction, Chlorine Reduction, Ozone Destruction, Disinfection // **UV SERIES:** TrojanUVLogic™, Optima HX™, SCD HT™, ChloRid™, CSL™

Aquafine has the largest installed base of applications in the Life Sciences industry, meeting the demands of USP and WFI applications.

### UV Technology

Regulations place not only a responsibility on the process design engineers, but also on manufacturers of water treatment systems. Aquafine can supply your pre-treatment or process stream with consistent and reliable dosage levels needed to meet USP or WFI specifications.

Aquafine UV systems are engineered to focus the power of concentrated UV light utilizing one or several specially designed Aquafine Colorguard™ UV lamps, recognized in the industry for unsurpassed performance and reliability.

Environmental responsible UV technology for water treatment produces no harmful by-products, imparts no taste or color and disinfects water to meet the highest standards in a variety of applications.



### UV Technology for Life Sciences

For 60 years Aquafine has been successfully serving the diverse Life Sciences industry. Aquafine ultraviolet (UV) units are reliable, deliver consistent performance and have become the brand of choice of WFI (Water-For-Injection) & USP (United States Pharmacopoeia) systems. Our products and services are found in both the pre-treatment and process areas of the water system. While commonly found in disinfection and ozone destruction applications, our low-pressure (LP), low-pressure high-output (LPHO) and amalgam systems can be found in TOC (total organic carbon) reduction and chlorine/chloramine destruction applications as well. ChloRid®, for chlorine/chloramines destruction equipment, utilizes medium-pressure (MP) technology with a reduced footprint and provides dose and is cost efficient.

The use of UV technology for water treatment has several inherent advantages. Nothing is added by UV light to the water stream such as color, odor, flavor, chemicals or harmful by-products. UV technology is a fast, efficient, cost effective and environmentally responsible solution.

Aquafine offers validated systems, providing UV lamp and NIST traceable UV sensor validation with certificates, as well as Bioassay amalgam technology. All systems comply with cGMP and FDA requirements and sanitary connections conform to DIN and USDA 3A standards. Select models carry the marks of cULus, CE and ANSI/NSF and can be mounted horizontally or vertically, or in skid mounted systems, maximizing installation flexibility and preserving floor space.

With Life Sciences UV system designs unparalleled in performance, Aquafine is committed to providing superior quality and the latest advancements in UV technology.

## UV Applications in Life Sciences

### Disinfection

This is the most common application of UV light in water treatment. A pharmaceutical water system could have several locations where UV equipment would be installed. Some typical locations of installation would be post-carbon filter and pre-RO (reverse osmosis). When installed downstream of the carbon bed and/or directly upstream of the RO unit, a UV system can significantly reduce the microbial counts by destroying at least 99.9% of the bacteria present in the influent stream. Disinfection is also recommended for the process distribution loop and pre storage tank.

### TOC reduction

The USP 31 regulations require an upper limit of 500ppb for TOC for both USP Purified Water as well as for WFI. Aquafine uses a powerful 185nm wavelength appropriately sized and designed to meet this application.

### Ozone destruction

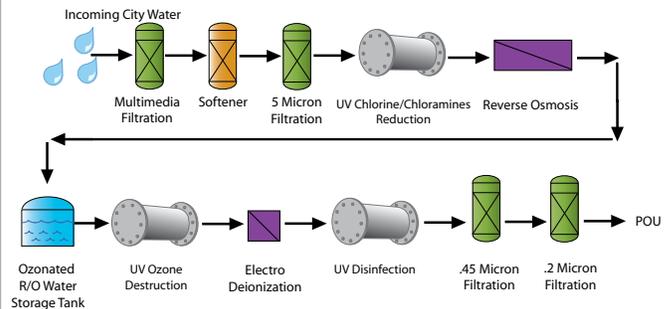
Ozone is commonly used in the pre-treatment area of a water system, as well as for sanitizing process and recirculating systems. Prior to the point-of-use, the residual ozone needs to be destroyed to ensure the process water is not compromised. Because it is a non-chemical, fast acting mechanism, UV technology is the preferred method for this application. After considering the appropriate variables, a properly sized UV unit can be guaranteed to destroy the ozone to non-detectable limits, ensuring the integrity of the process and the product. A dosage of 90 mJ/cm<sup>2</sup> is recommended for destruction of ozone residuals of 1.0ppm.

### Chlorine/chloramines destruction

While the addition of chlorine and chloramines to municipal water may control bacteria levels, they have undesirable effects on the degradation of membrane filtration or RO. But popular methods of removal such as carbon beds or chemical injection, have proven to be problematic. Sodium metabisulfite involves replacing one chemical with another and creates food for microorganisms, while carbon beds can be inefficient, vulnerable to channeling and provide breeding grounds for microorganisms. Aquafine pioneered the technology of chlorine and chloramines destruction utilizing UV light in the pre-membrane filtration or RO make-up water stream.

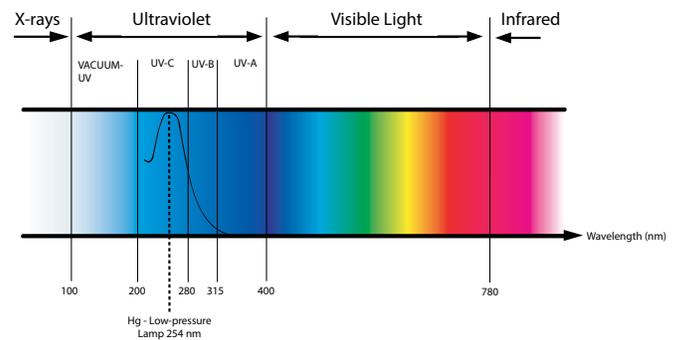
For questions regarding your application needs, please contact your local Authorized Distributor or Aquafine for more information.

## Life Sciences Water Treatment System



Ultraviolet (UV) light is a form of light that is invisible to the human eye. It occupies the portion of the electromagnetic spectrum between X-rays and visible light. A unique characteristic of UV light is that a specific range of its wavelengths, those between 200 and 300 nanometers (billionths of a meter), are categorized as germicidal – meaning they are capable of inactivating microorganisms, such as bacteria, viruses and protozoa.

## ELECTROMAGNETIC SPECTRUM



Aquafine is an ISO 9001:2008 certified company. Aquafine equipment performance is guaranteed with the use of genuine OEM replacement parts.

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