WHITEPAPER: UV DISINFECTION FOR

Schools, Colleges & Daycare

SINCE 1963 ATLANTIC ULTRAVIOLET CORPORATION®

A Breeding Ground for Germs

Since classrooms are occupied by children in a small, enclosed space, they create conditions conducive to the spread of viruses and bacterial infections. When students touch their faces, they also pick up germs that they spread to surfaces and objects. In particular, *Norovirus* can live on surfaces for up to two weeks, and as a result, disrupt classroom attendance.[1] Whether preschool, kindergarten, elementary, high school, or college—each group is susceptible to certain types of infections.

Improving Inadequate Ventilation

School administrators have recognized the need for proper ventilation, upgraded HVAC systems, and HEPA filters to help prevent pathogens from spreading.[2] Although ASHRAE has published guidelines for ventilation in school buildings,[3] many schools don't meet these requirements because of older buildings or budget cuts.[4] As a result, it recommends that these educational facilities adopt one of two methods of UVGI: upper room systems or in-duct HVAC systems.[5]

Disinfection of air and surfaces with germicidal light is a well-established technology with demonstrated effectiveness against many pathogens.

ASHRAE, Reducing Infectious Disease Transmission with UVGI[6]

Documented UV-C Success

In 1937, Harvard engineer William F. Wells conducted an experiment, equipping schools in Philadelphia with upper-room UVGI fixtures.[7] Room air was treated as it circulated through natural convection and passed over the fixtures—introducing disinfected air throughout the school day. Incidents of measles infection greatly diminished among the students (13.3% infection rate). In comparison, classrooms not equipped with ultraviolet units experienced a 53.6% infection rate.

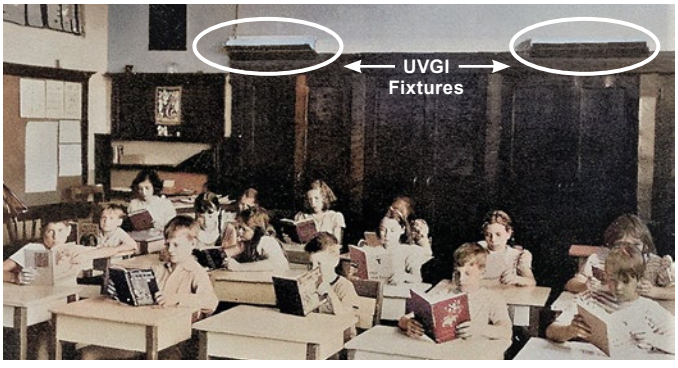

Figure 1: Upper Room UV Fixtures in Philadelphia Classroom

Educational facilities for children and students are focal points for disease transmission and as such they are ideally suited to UV applications that inhibit the transmission of contagious diseases.

W. Kowalski, Ultraviolet Germicidal Irradiation Handbook

UV-C Wavelength and Doses

UV-C rays at 254 nanometers demonstrate the maximum germicidal effectiveness against harmful microbes, discouraging the spread of bacteria, viruses, and fungi in the air, on surfaces, and in water. See the light spectrum segment below.

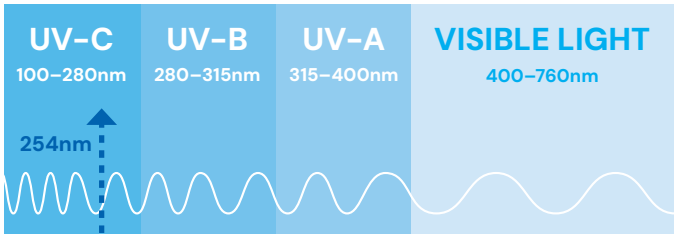

Figure 2: A Portion of the Electromagnetic Spectrum

The UV-C doses below will neutralize many harmful microbes that can be found in schools, colleges, and daycare facilities.[8] Millijoules per square centimeter (mJ/cm^2) measure energy produced by germicidal lamps over a certain amount of time.

Microorganism	UV Dose (mJ/cm^2)
Influenza	1.20
Adenovirus (various types)	34.0–116.0
Coxsackie	6.30
Norovirus	15.0
Morbillivirus hominis (measles)	4.40
Streptococcus pyogenes	.80
SARS-CoV-2 (COVID-19)	5.0

Table 1: UV-C Doses to Neutralize Airborne Microbes

UV-C Air & Surface Solutions

Upper Room UVGI

The upper room method of UV disinfection is ideal for multiple applications in schools and colleges, such as lecture halls, cafeterias, libraries, and student centers. This indirect method neutralizes contaminants that inevitably enter the disinfection zone by natural air circulation—exposing them to damaging UV rays.

When fixtures are mounted at least 7 feet from the floor, disinfection can safely occur while the room is still occupied. Install our Hygeaire® models on a plumb, vertical surface able to support 16 pounds. Two-lamp (ceiling mount) installations must support 40 pounds.

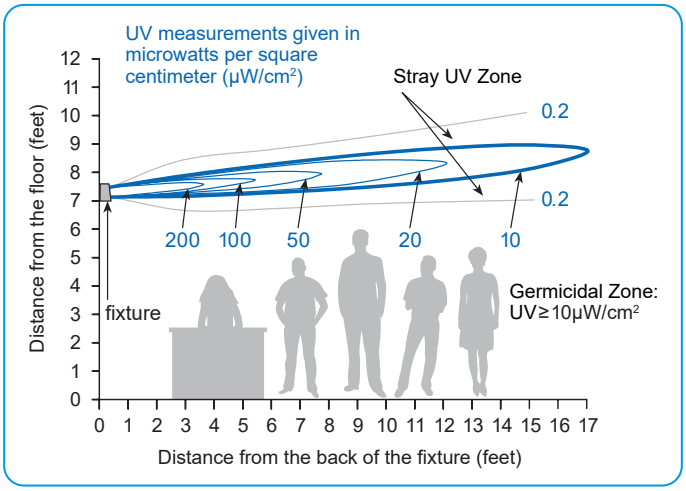

Figure 3: Distribution of UV Rays from Hygeaire®

Upper room UV disinfection had the lowest cost per equivalent room air change when compared with four other room air cleaners. It is also found to be nearly 10 times more cost-effective than mechanical ventilation.[9]

Room Air Disinfection

Protect students and faculty from airborne microbes in large, poorly ventilated spaces like auditoriums, classrooms, gymnasiums, lecture halls, and break rooms. Our Sanitaire® room air sanitizer is available in mobile, ceiling, and wall mounted models. These units increase the frequency of room air changes by drawing in air through a robust filter, treating it with UV in the reflective exposure chamber, and releasing it back into the space. Since microbes are neutralized, they are unable to inflict harm on instructors and students.

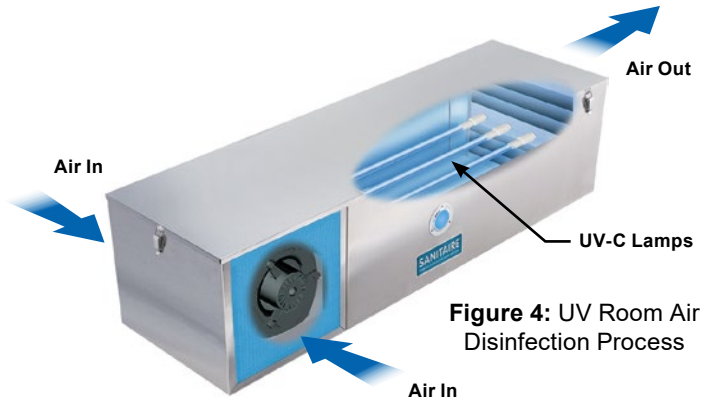

Figure 4: UV Room Air Disinfection Process

HVAC System Disinfection

A well-designed and maintained HVAC system serves as the lifeblood of air exchange in a building—providing classrooms, gymnasiums, and childcare facilities with healthier air to breathe. In-duct UV disinfection near the cooling coils will vastly improve the indoor air quality, lower your maintenance costs, and improve system performance.[10] In-duct systems are most efficient when installed in a long, straight run allowing at least 0.25 seconds of UV exposure.[10]

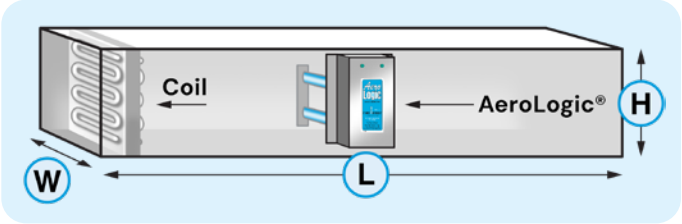

Figure 5: UV Disinfection Installed Horizontally in Air Duct

One extensive study found a 99% reduction of microbes in a ventilation system after proper use of UV-C duct disinfection.[11] Participants experienced significantly less headaches, coughs, congestion, and respiratory issues. Our AeroLogic® Duct Disinfection System has various models for your school, college, or daycare center.

Direct Air & Surface Disinfection

Direct UV-C is an effective means of treating air and surfaces that harbor infection, but it can only be used after hours when no one is present. Combat the threat of pathogens like Norovirus, Influenza, and SARS-CoV-2 with Sanidyne®, a portable ultraviolet unit with exposed lamps. It can be placed strategically to disinfect a particular area, then easily rolled or carried to a new location. This process will greatly minimize the existence of viruses and bacteria that are lingering within the classroom, ready to infect another host.

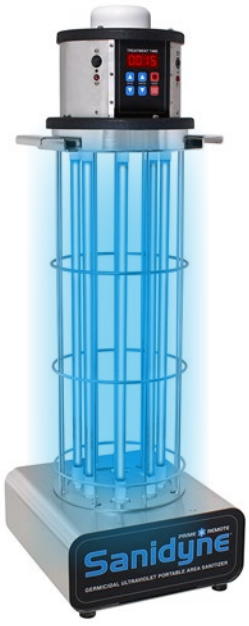

Figure 6: Direct UV Air & Surface Disinfection Model

MADE IN THE USA
FROM U.S. & IMPORTED PARTS

UV-C Water Disinfection

While lead exposure from aging pipes is of great concern in schools across the nation,[12] the existence of germs and parasites in the water supply should be an even greater concern. Unfortunately, most schools do not flush their water pipes as they should.[13] During school breaks, water can sit stagnant in the plumbing system for days, weeks, or even months. *Legionella* bacteria have been found in the water supply before it finds its way to the faucet.

Our Sanitron® models install at your building's point of entry for an entire water supply (up to 40 gallons per minute). Our Bio-Logic® models install at the site of lab sinks, bathroom sinks, and water fountains. Bio-Logic® models are available as standalone water purifiers (model BIO-1.5 or BIO-3.0) or as a combination water purifier and dual-filter system.

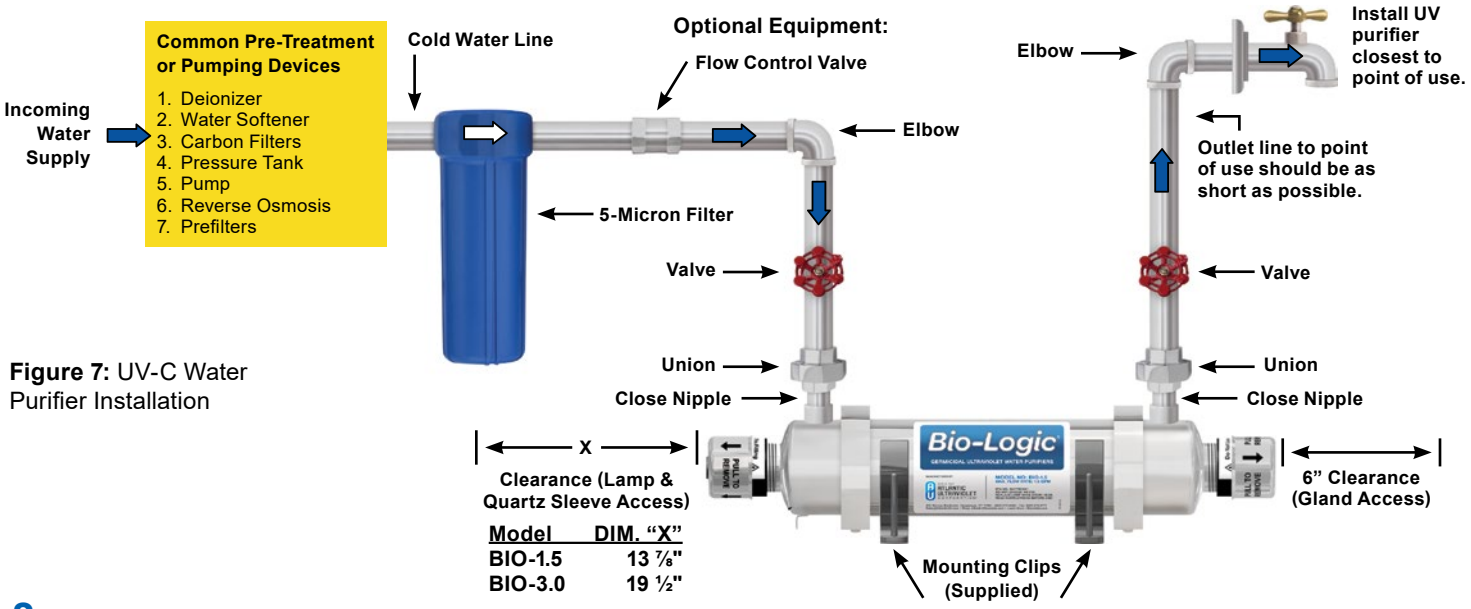

Figure 7: UV-C Water Purifier Installation

Sources

1. Norton Healthcare. "Norovirus symptoms tend to pass after a few days, but the virus can live on surfaces." Updated April 2024. https://nortonhealthcare.com/news/how-long-does-norovirus-live-on-surfaces/
2. Mark-Carew, M et al. "Ventilation Improvements Among K–12 Public School Districts — United States." *MMWR Morb Mortal Wkly Rep*, Vol 72, No. 14. August–December 2022. Pages 372–376. https://www.cdc.gov/mmwr/volumes/72/wr/mm7214a4.htm
3. ASHRAE. "Design Guidance for Education Facilities: Prioritization for Advanced Indoor Air Quality." 2003. https://www.ashrae.org/file%20library/technical%20resources/free%20resources/design-guidance-for-education-facilities.pdf
4. Kowalski, Wladyslaw. *Ultraviolet Germicidal Irradiation Handbook: UVGI for Air and Surface Disinfection*. Springer, 2009. Chapter 17. https://link.springer.com/chapter/10.1007/978-3-642-01999-9_17
5. Schoen, Lawrence J. "Evaluating Ultraviolet Germicidal Irradiation." *ASHRAE Journal*. August 2021. https://www.ashrae.org/file%20library/technical%20resources/ashrae%20journal/2021journaldocuments/august2021_26-31_ieq_schoen.pdf
6. Banhfleth, William P. "Reducing Infectious Disease Transmission with UVGI." ASHRAE, 2020. https://www.ashrae.org/File%20Library/Technical%20Resources/COVID-19/FINAL-4-21-2020-ASHRAE-One-Hour-UVGI-Course_BH-Copy.pdf
7. Reed, Nicholas G. "The History of Ultraviolet Germicidal Irradiation for Air Disinfection." *Public Health Reports*, Vol. 125, No. 1. January–February 2010. Pages 15–27. https://journals.sagepub.com/doi/epdf/10.1177/003335491012500105
8. Sources for all UV-C doses can be found on Ultraviolet.com/microorganisms-inactivated/
9. Nardell, Edward A. "Air Disinfection for Airborne Infection Control with a Focus on COVID-19: Why Germicidal UV is Essential." *Photochemistry and Photobiology*, Vol. 97, No. 3. May/June 2021. Pages 493–497. https://onlinelibrary.wiley.com/doi/10.1111/php.13421
10. ASHRAE. *2019 ASHRAE Handbook—HVAC Applications*. Chapter 62: Ultraviolet Air and Surface Treatment. https://www.ashrae.org/file%20library/technical%20resources/covid-19/i-p_a19_ch62_uvairandsurfacetreatment.pdf
11. The Lancet. *Effect of ultraviolet germicidal lights installed in office ventilation systems on workers' health and wellbeing: double-blind multiple crossover trial*. https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(03)14897-0/abstract
12. EPA. "EPA Issues Final Rule Requiring Replacement of Lead Pipes Within 10 Years." October 2024. https://www.epa.gov/newsreleases/epa-issues-final-rule-requiring-replacement-lead-pipes-within-10-years-announces-2
13. The Conversation. "Dangerous bacteria is showing up in school water systems." Updated September 2020. https://theconversation.com/dangerous-bacteria-is-showing-up-in-school-water-systems-reminding-all-buildings-closed-for-covid-19-to-check-the-pipes-144322

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