

illumPure™ Air and Surface Disinfection Solution Suite

Use Case: Athletic Facilities, Fitness, and Academic Sports



Continuous, Location-specific Air and Surface Disinfection

The illumPure Suite is **the only solution worldwide** that can safely, continuously, and simultaneously purify and disinfect the air and remove microbial species from surfaces in occupied spaces. Patented visible light disinfection and sub-second microbial destruction provide an unmatched and proprietary level of infection prevention and air quality management and monitoring.

These capabilities are critical in athletic and fitness settings, where close contact is unavoidable. Close contact occurs in many athletic areas - on the field, locker rooms, weight and training rooms, meeting facilities, and many more spaces.

Protection for Athletes, Customers, Students, Staff

SARS-CoV-2 has proven to be overwhelming even the most stringent prevention measures, such as strict protocols and vaccination rates. That this is occurring among the healthiest (and youngest) of all cohort groups is startling.

On December 11, The New York Times Editorial Board had this to say about “Being Smart About Covid” (<https://www.nytimes.com/2021/12/11/opinion/covid-vaccine-omicron-boosters.html>)

“Do away with Covid theater. The coronavirus is airborne, and any money spent on deep cleaning would be better put toward improved building

ventilation. But instead of upgrading their HVAC systems, too many schools and businesses are still relying on things that won't work nearly as well.

The plastic barriers that have become common in restaurants, nail salons, and offices, for example, [can impede airflow and exacerbate viral spread](#). Lawmakers and local officials should make a concerted effort to change that. Not only would improved ventilation help thwart coronavirus, but it would also curb the spread of other airborne pathogens, including the flu and those that cause the common cold."

The concept of ventilation and "upgrading HVAC systems" is a welcome, even sane, improvement over plastic barriers, spacing, and even portable HEPA filters. "Ventilation" is another way of describing ambient (existing) air dilution and replacement. It adds a level of prevention by reducing the number of infectious particles in room air."

While basic ventilation methods are essential, the success of improved ventilation **is subject to too many variables to be a reliable prevention measure. We have learned this in schools, hospitals, businesses, and professional sports. It's not good enough.** And that's because of all of those variables, all happening within a given space.

Being Smart about Infection Prevention

In collaboration with NIOSH, the CDC developed the well-known framework of an infection prevention strategy, known as the "Hierarchy of Controls."¹ It's as valid today as in 2020 when SARS-CoV-2 began emerging.

The Hierarchy of Controls shows all levels of a good prevention plan. The highest level is "removal," meaning destroying or eliminating the pathogen. In other words, the apex of the strategy is to destroy the SARS-CoV-2 virus as quickly and effectively as possible. Clear the pathogen from the room without cross-contamination (in some cases, due to "ventilation").

Air Guardian® - Part of an Overall Infection Prevention Strategy

The illumiPure Suite of Solutions can be an incredibly effective mitigation strategy for athletic programs, gyms, and fitness centers.

The illumiPure solution is to

- a) **use multiple biophysical mechanisms to kill airborne pathogens immediately – within an individual space**
- b) **change the room air safely and frequently,**
- c) **provide protective airflow into personal spaces**

¹ <https://www.cdc.gov/niosh/topics/hierarchy/default.html>



d) **continuously and safely disinfect surfaces**

The illumiPure Solution Suite for Athletics and Fitness

The illumiPure solutions include Air Guardian®, CleanWhite®, and Vertices®

1. **Air Guardian®** destroys airborne pathogens in every room immediately. Air Guardian® kills all variants of SARS-CoV-2 in sub-seconds. It also kills wild-type and resistant bacteria, spores, molds, yeast, and other viruses (including all RNA and DNA viruses) in sub-seconds.
2. **Air Guardian® Precision Airflow** provides optimal downward displacement of disinfected air into the occupant breathing zones. This process continuously replaces air in the breathing zone and helps ensure that room air is purified every few minutes.

Unlike other disinfection and purification devices, Air Guardian releases purified air from multiple vents (usually in ceiling-mounted locations) away from its induction vents. Multiple-vent technology enhances room air changes and creates much larger areas of protective, clean air in the room.

3. **CleanWhite®** simultaneously and continuously disinfects surfaces, which is essential for athletic spaces. Nearly all athletic spaces typically contain high counts of surface pathogens, including locker rooms, training rooms, shower areas, and laundry facilities. CleanWhite® uses safe, white-illuminating light to eliminate 99.9% of microbial pathogens on surfaces, including those within hard-to-kill biofilms.
4. **Vertices® - The Vertices® Sensor Array** measures Carbon Dioxide, total volatile organic compounds, formaldehyde, particulate matter (counts and densities), Nitrogen Dioxide, Carbon Dioxide, Carbon Monoxide, Oxygen, temperature, and relative humidity. Vertices® also provides an indoor air quality index, which is a snapshot of overall air quality.

The data values can be displayed in real-time, periodically, graphically, or *cumulatively* where needed or appropriate. Vertices' proprietary processing software integrates, stores, and curates the measured data.

Retrospective data is captured and stored in the cloud for analysis.

Vertices® is the only sensor system that can compare indoor air quality to outdoor air; important to occupants, facility and HVAC managers, and researchers.

The data captured by Vertices® is vital to the study of how air quality affects health, behavior, cognition, infectious disease, cancer, cardiovascular disease, behavioral health, incidence rates, and more.



Air Guardian® Science

Air Guardian's world-class² high-intensity ultraviolet LEDs fill a patented matrix of serpentine chambers with UV energies as high as 240 Watts. Scientific studies³ have shown that as little as .0169 Watts can completely kill the SARS-CoV-2 virus.

As room air travels through Air Guardian's chambers, it is also simultaneously exposed to a plasma-like cloud of super-oxide ions. These destructive oxides and ions are robust – they immediately destroy pathogens on contact.

Air Guardian® is the only device that can process air with such intense disinfection and purification properties for such long periods (dose-time). The chamber matrix uses fluid dynamic elements to retain air for extended durations – up to 22 seconds. This extended air residency within the device helps ensure that harmful



² From Seoul SETI (Viosys) <http://www.seoulviosys.com/en/>

³ Biasin, M., Bianco, A., Pareschi, G. et al. UV-C irradiation is highly effective in inactivating SARS-CoV-2 replication. *Sci Rep* **11**, 6260 (2021). <https://doi.org/10.1038/s41598-021-85425-w>

chemicals, particles, and pathogens can be entirely destroyed or eliminated.

SARS-CoV-2 is easily and quickly destroyed.

Viruses, fungus, mold, bacteria, and spore forms are also all destroyed within Air Guardian's high-energy and plasma-filled chambers.

