

# RETAIL & RESTAURANT

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**FACILITY BUSINESS**®

## Elevated Experience

# Ghirardelli

*The historic Ghirardelli Chocolate Company sweetens the experience for guests with ambitious renovation plans for 3 flagship locations in San Francisco.*

**Plus:**

- Improve Indoor Air With UVC Lighting
- What's Your Pest Prognosis For 2022?
- How To Save On Roof-Related Remodeling Costs
- 4 Ways To Improve Curbside Pickup & Delivery
- The Evolution Of Modern Restaurant Design
- Post-COVID Supply Chain Advantages
- Next-Level Tech Experiences In Immersive Retail



# Safe & SANITIZED

*UVC light inactivates viruses and other airborne pathogens, improving indoor safety in commercial spaces.*

**W**ith commercial facilities taking precautions against viruses as never before, an effective new tool in their arsenal is a new type of “germicidal” LED fixture. This specialized, enclosed LED fixture draws in air and irradiates it with ultraviolet light (UV), significantly improving indoor safety by providing continuous disinfection of airborne viruses as well as bacteria and germs. While traditional UV fixtures have been used for many years to clean surfaces, they could not be safely used in occupied spaces. The new type is designed to safely and constantly disinfect indoor air in occupied rooms.

Although LED light fixtures normally emit non-harmful visible light with a 400 nm to 700 nm wavelength, lower frequency ultraviolet (UV) light LEDs can effectively kill such pathogens. UVC, a very powerful ultraviolet light wavelength between 180 nm and 280 nm, is viricidal, bactericidal and fungicidal since it passes through the outer wall of the pathogen and causes damage at the molecular level. The destruction ultimately leads to inactivation of the pathogen, making the cells unable to reproduce.

UVC is known to disinfect air, water and nonporous surfaces and has effectively been used for decades to reduce the spread of bacteria such as tuberculosis, influenza and Legionnaire’s disease. According to the CDC, UVC is the only recognized technology for effective germicidal treatment for airborne pathogens.

The CDC has also determined that the integration of in-room UVC sources in conjunction with building-wide HVAC systems has great promise, particularly given the growing knowledge of the dangers of airborne viruses. Best of all, these standalone UVC fixtures can be used continuously throughout the day, in occupied rooms, even when the HVAC system is off.

“In indoor settings, one of the best ways to combat airborne viruses is to continuously recycle individual room air while safely treating it with UVC radiation,” says Michael Fischer, president of Energy Harness Corporation, a Florida-based designer and manufacturer of LED lighting for a variety of commercial settings. “Unlike traditional wide spectrum fluo-

rescent or mercury vapor UV tubes, LEDs can produce UVC by controlling the specific wavelengths of light emitted. In addition, they don’t contain extremely toxic substances like arsenic or mercury that are inherent in the traditional UV tubes.”

Prior to the pandemic, Energy Harness responded to the demand for hydroponic “grow” lighting, and designed LED lights with color spectrums (including UV) to mimic sunlight. When the COVID pandemic began, Fischer says his team quickly realized the potential effectiveness of UVC technology to deactivate viruses and used the technology to design a fixture to treat the airborne organisms.

However, to do this requires technology that can safely deliver the proper UVC dosage in a specific combination of three main factors: dosage, distance and wavelength.

“Ultimately, germicidal efficacy of ultraviolet light is based on dosage, distance and wavelength,” explains Fischer. “Dosage is a function of UVC power multiplied by exposure time. Distance is the proximity of the pathogen to the UVC source. And wavelength is the nanometer range of the ultraviolet light.”

According to Fischer, to eradicate pathogens effectively, the UVC wavelength should be in the germicidal effective range, with a peak of approximately 268 nm. The intensity must be high enough to irradiate the space, and the duration must be long enough to affect the organism. He spells out the equation as (Wavelength Intensity \* Duration) = Dosage Delivered.

After significant R&D, the LED

manufacturer developed a ceiling mounted UVC system called Active-Airflow that circulates room air many times per hour into an enclosed chamber, where UVC disinfection occurs.

Due to its unique patent pending design, the unit allows for an exceptionally long exposure time. The internal germicidal chambers are filled with hundreds of high-powered LEDs arranged in very close proximity to the airborne pathogens as they move through the fixture.

With the intensity, the distance and the time measured, Energy Harness can effectively “control” the UVC dosage. In addition, the LEDs in the unit irradiate in the most effective germicidal range (with a 260-280nm wavelength).

When the Active-Airflow LED fixture was tested by Intertek Laboratories (ETL), a nationally recognized testing laboratory (NRTL), it was shown to be 99.9% effective in eliminating airborne pathogens. Further laboratory testing directly on the SARS-CoV-2 virus has shown the LED technology produced in the Active Airflow fixture showed a 99.998% inactivation of the virus — within one second. A virus reduction rate of 99.999% is the maximum sensitivity that the testing mechanism could measure.

“To know that our technology maxed out the testing equipment, that’s a pretty exciting moment,” says Peter Lehrer, senior vice president for project development at Energy Harness. “It says that we’ve got the ultimate virus killer on our hands.”

Because the unit houses the UVC

LEDs internally, it does not produce any visible light in the room it disinfects. With the unit mounted in the ceiling, the people occupying the space are completely shielded from the UVC. Each LED fixture can typically disinfect a 256-square-foot area, depending on average occupancy, occupant activity level, etc., and multiple units can be deployed in larger rooms, according to Fischer.

When installed in standard ceiling grids, the pathogen inactivating UVC LED fixture can be used continuously through the day in occupied rooms, which enables constant airborne disinfection of the air throughout the area.

The unit is UL and CSA certified by Intertek Testing Laboratories (ETL) and is manufactured in an EPA-registered facility in Florida. It has also been certified by ETL to produce no harmful ozone and is registered with the California Air Resources Board (CARB).

Although this UVC LED unit works independently from the HVAC system, it still uses active air handling to draw room air into the unit. The standalone approach of the disinfection system could make it simpler for most facilities to install. The unit is designed to fit into a grid ceiling much like a troffer luminaire and takes up the same space as a single 2- by 4-foot ceiling tile.

The primary focus of the fixture is on safety and the continuous disinfection of airborne viruses, yet aesthetically pleasing architectural designs are also being developed to complement a variety of interiors in commercial facilities.

As commercial facilities seek to make indoor areas safer while occupants are still in the room, the incorporation of fixtures that can continuously kill airborne pathogens will be vital to aid safe operation. ■

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