

GE current
a Daintree company



Disinfection Lighting

Let your *lights care* for you



The Problem

There is potential for **Healthcare Associated Infections (HAIs)** in nearly every hospital environment. While all hospitals address infection control through various methods, a single HAI can be costly, detrimental to a hospital's reputation, and potentially devastating for impacted patients.



The Solution

Every precaution counts in environments where quality of patient care is crucial. Imagine a ubiquitous solution designed to minimize potential for HAIs in virtually any hospital room by leveraging existing lighting infrastructure.

Lab and clinical testing has shown that **Current's Disinfection** products have the ability to significantly reduce pathogens commonly present in hospital environments.

- Approximately 90-99% reduction of common pathogens on surfaces over 8 hours.
- Current's disinfection technology uses a unique patented technology in the safest UVA light wavelengths.
- This is very different from other products in the market, as others use different wavelengths of light, that may not be as effective.
- Current's disinfection technology is safe for human exposure, per the guidelines of standard IEC62471 – Photobiological safety of lamps and lamp systems.



The Cost

Hospital readmissions represent a major health and financial burden. **Nearly 30%** of hospitalized patients are readmitted within **1 year** of hospitalization, with over half occurring within 30 days of discharge. The Centers for Medicare and Medicaid Services (CMS) estimate rehospitalization costs among Medicare patients alone at **\$17 billion** annually, according to a UC Irvine study.



Highlights



Protected

Current's patented disinfection lighting technology has shown to combat common pathogens via in-vitro testing

(Pathogens tested: *S. aureus*, including MRSA, *E. faecalis*, *E. Coli*, *C. auris*)



Safe for Everyone

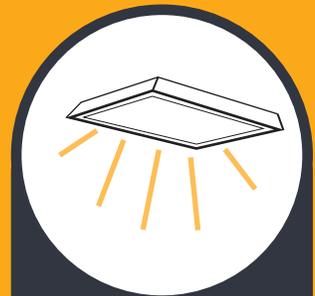
Safe for employees and patients in accordance to the IEC photobiological safety standard 62471

365nm UVA light emitted from the fixture is invisible to the human eye.



Controls

Integrated in the fixture with standard white light. Disinfection light can be controlled independently of white light using wired or wireless controls



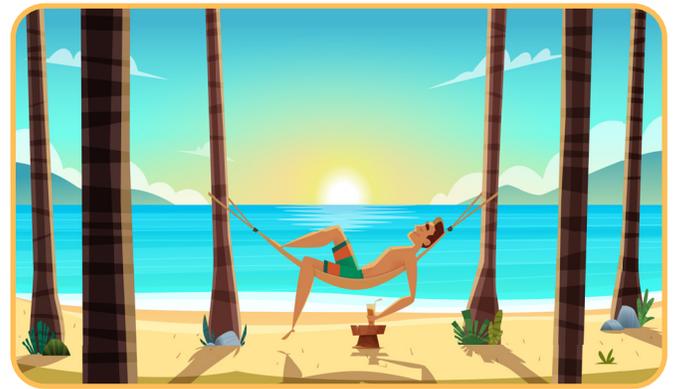
Periodic vs Continuous

- **The 8-Hour Cycle:** Provides an optimal kill rate. Through high intensity irradiance, with no disruption to the workflow.
- **The 24-Hour Cycle:** Provides a standard kill rate. Through a continuous low intensity irradiance, with no disruption to the work flow.



Did you know?

Less than 3 minutes of exposure to direct sunlight is equal to the maximum amount of actinic UVA light a person may be exposed to in a typical workday under Current's disinfection lights.



The irradiance of Current's disinfecting UVA light typically exposes a person to 3 W/m^2 but no more than 10 W/m^2 , with an exposure time of less than 8 hours per day.

The actinic dose of 8 hours from our disinfecting light at:

- 10 W/m^2 is equal to being in direct sunlight for 2m 40s; and
- 3 W/m^2 is equal to being in direct sunlight for 47s.

Current's UV-A lighting follows IEC 62471 Standards

IEC 62471 – Photobiological safety of lamps and lamp systems

- Actinic UV Hazard – Skin/eye exposure to UV can lead to erythema (sunburn)
- Near-UV Hazard – Eye exposure to UV-A can lead to cataracts in the lens
- Blue Light Hazard – Eye exposure to blue light can result in photoretinitis on the retina



What is IEC 62471?

IEC 62471 photobiological safety standards weren't developed overnight; it's origins can be traced from efforts going back to the 1990s. Since then, there have been several modifications to keep up with LED technology, ultimately leading to the development of **IEC 62471, Photobiological Safety of Lamps and Lamp Systems**. Today, IEC 62471 is recognized in many countries as the key standard addressing photobiological safety issues related to lamps, lamp systems and other non-lamp sources of optical radiation.

- IEC 62471 assesses the level of harmful radiation of a given product through **two key** radiometric parameters: irradiance and radiance.
- **Irradiance** measures the rate at which radiation falls onto a surface and evaluates the potential hazard it may have on skin and front of the eyes.
 - **Radiance** measures the amount of light collected by the pupil and evaluates the risk of hazards to the retina of the eye.

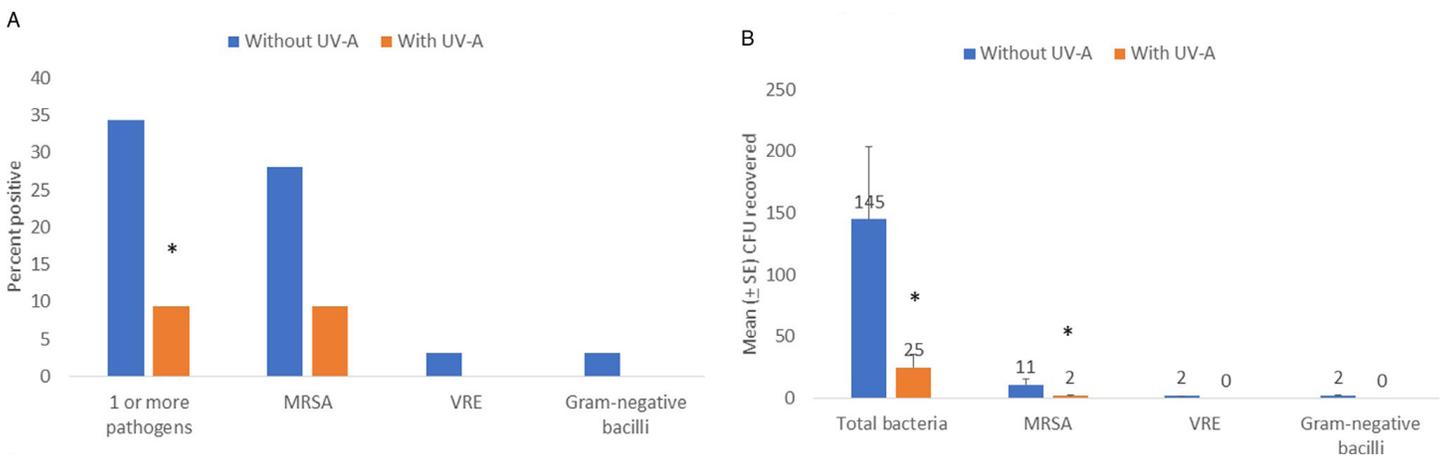
Once a product's effective radiance and irradiance are determined and compared to the hazard limits defined by the IEC 62471 standards, the product is then placed into specific categories to communicate the overall level of risk.

Efficacy of an ultraviolet-A lighting system for continuous decontamination of healthcare-associated pathogens on surfaces

Overview

Key Findings:

Reduction of microorganisms by treatment of inoculated steel carrier disks with 365nm UVA at 3 W/m²
Greater than 1 log₁₀ (90%) reduction of MRSA and bacteriophage MS-2 with a single 8-hour treatment
0.7 log₁₀ (80%) reduction of *Candida auris* with a single 8-hour treatment
Reduction of pathogens on in-use medical equipment (see figures below)
Significant reduction in the frequency of recovery of pathogens from medical equipment with a single 4-hour exposure
Significant reduction of mean CFU of total bacteria and MRSA recovered with a single 4-hour exposure



Abstract:

We found that ultraviolet-A (UV-A) light exposure resulted in a modest reduction in recovery of methicillin-resistant *Staphylococcus aureus* (MRSA), *Candida auris*, bacteriophage MS2, and bacteriophage Phi X174, but not *Clostridioides difficile* spores, on steel disk carriers. Four hours of UV-A exposure from a ceiling light fixture resulted in a significant reduction in pathogenic microorganisms recovered from in-use medical equipment. These findings suggest that UV-A could be useful as a means to provide continuous low-level decontamination of surfaces in health care facilities.

Citation:

Livingston SH, Cadnum JL, Benner KJ, Donskey CJ. Efficacy of an ultraviolet-A lighting system for continuous decontamination of health care-associated pathogens on surfaces. *Am J Infect Control*. Article In Press. <https://doi.org/10.1016/j.ajic.2019.08.003>

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The Current Difference

Our products embody quality and reliability. With over 100 years of experience designing lighting solutions, you can trust our products and the warranties that back them. **GE Current, a Daintree company** builds on a legacy of quality and a tradition of providing reliable, trusted products.

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