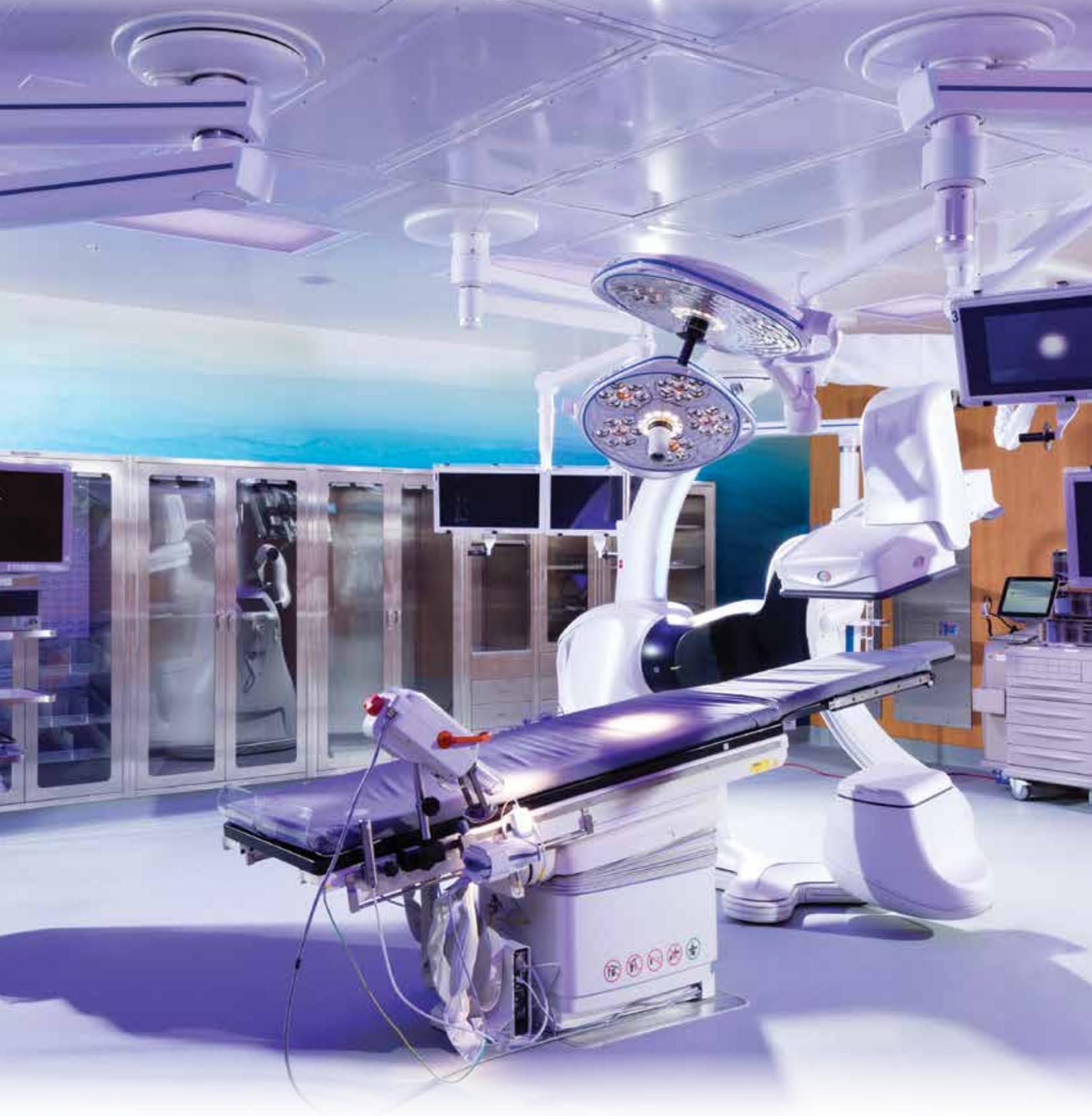


**Indigo-Clean®**

**Healthcare Luminaires**  
*Providing Continuous Visible Light Disinfection*



A brand of **legrand®**

**KEVAL®**

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## Why Indigo-Clean?

### The problem:

Current environmental disinfection methods are short-lived, and harmful bacteria begin re-populating the space as soon as cleaning is complete.

### The solution:

Indigo-Clean is a patented, continuous environmental disinfection technology that uses visible light to safely, automatically and continuously kill harmful bacteria, **24/7**, in the air, and on hard and soft surfaces. It also prevents bacteria from repopulating the space, consequently bolstering current infection prevention efforts.

### What makes Indigo-Clean Unique:

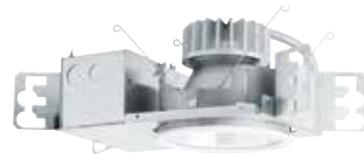
- Indigo-Clean is an environmental disinfection device that is integrated into your lighting
- Indigo-Clean kills bacteria in the air, and on hard and soft surfaces, that can be missed during routine cleaning
- Indigo-Clean requires no special training, additional staff or consumables to operate
- Indigo-Clean is **NOT UV** light... it uses *safe* 405nm visible light



M4SEDIC Series



MEIC Series



M4DLIC6 Series

# How Does Indigo-Clean Work?

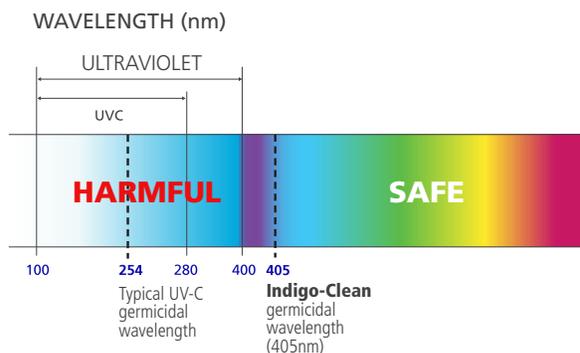


Indigo-Clean requires no line of sight to disinfect, but instead reflects off surfaces, disinfecting everywhere the light reaches.

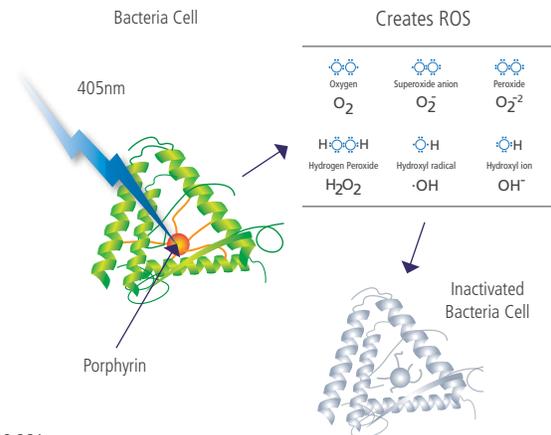
## How It Works\*:

- The 405nm emitted from Indigo-Clean luminaires reflects off of walls and surfaces, penetrating harmful micro-organisms
- The 405nm light targets and excites naturally occurring molecules within the bacteria called porphyrins, to produce intra-cellular Reactive Oxygen Species (ROS).
- Similar to bleach, these ROS create an oxidative environment within the organism, inactivating it and preventing it from re-populating the space.

### Visible light spectrum showing the active element in Indigo-Clean



### Inactivation of bacteria via visible light absorption



\* Indigo-Clean products and technology covered by U.S. Patent No. US 9,039,966 and US 8,398,264. May also be covered by patents found at [www.kenall.com/patents](http://www.kenall.com/patents). Other patents pending.

# What Does Indigo-Clean Kill?

## ESKAPE Pathogens:

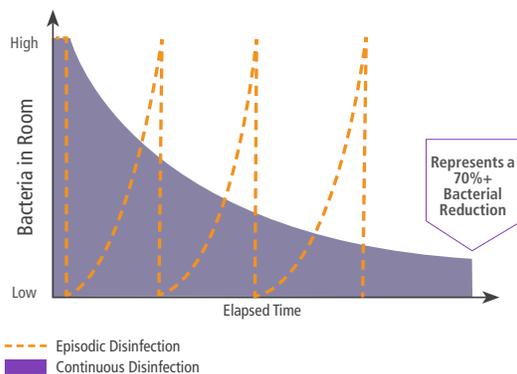
- E**nterococcus faecalis
- S**taphylococcal Aureus (incl. MRSA)<sup>1</sup>
- K**lebsiella pneumoniae
- A**cinetobacter baumannii
- P**seudomonas aeruginosa
- E**nterobacter species

## As well as a range of other organisms:

- *C. diff*<sup>1</sup>
- VRE
- *Aspergillus niger*
- *E.coli*
- *Salmonella enteritidis*

# Continuously Reduce Harmful Bacteria by 70%+ with Indigo-Clean

Continuous Vs. Episodic Disinfection



Clinical testing has shown Indigo-Clean can achieve a continuous 70%+ reduction of harmful bacteria<sup>2</sup> in the environment. At the same time, recently published studies show that improved cleaning can reduce HAI rates for certain organisms.<sup>3</sup>

These results, combined with the additional cost per patient due to HAI, suggest that preventing even a single infection would create a positive ROI and drive down costs for healthcare providers.

1: Antimicrobial Activity of a Continuous Visible Light Disinfection System by Rutala, et. al, ID Week 2016

2: Maclean M., S.J. MacGregor, J.G. Anderson, G.A. Woolsey, J.E. Coia, K. Hamilton, I. Taggart, S.B. Watson, B. Thakker & G. Gettinby (2010). Environmental Decontamination of a Hospital Isolation Room using High-Intensity Narrow-Spectrum Light. *Journal of Hospital Infection*, 76(3); 247-251. DOI: 10.1016/j.jhin.2010.07.010

3: Alfa MJ et. al. "Use of a daily disinfectant cleaner instead of a daily cleaner reduced hospital-acquired infection rates", *Am J Infect Control* 2015;43:141-146

# Clinical Effectiveness

## AJIC Peer Reviewed Study Results from Maury Regional Medical Center

### Goal

To reduce the number of surgical site infections (SSIs) with the addition of the Indigo-Clean Visible Light Disinfection (VLD) system.

### Methods

Indigo-Clean was installed into one orthopedic OR and its effect on bacteria levels throughout the room was measured using Baird Parker Agar (BPA) contact media for a period of 30 days. During this time, each room was cleaned using the facility's standard work process. Infection rates were compared one year before and after the VLD system implementation.

### Results

The results from the test room show a continuous, average bacterial reduction of between 56%–88% from the sampled surfaces as compared to those in the two weeks before and after the VLD system installation. Infections were tracked for 12 months and showed a 73% reduction in the test room as compared to the baseline period.

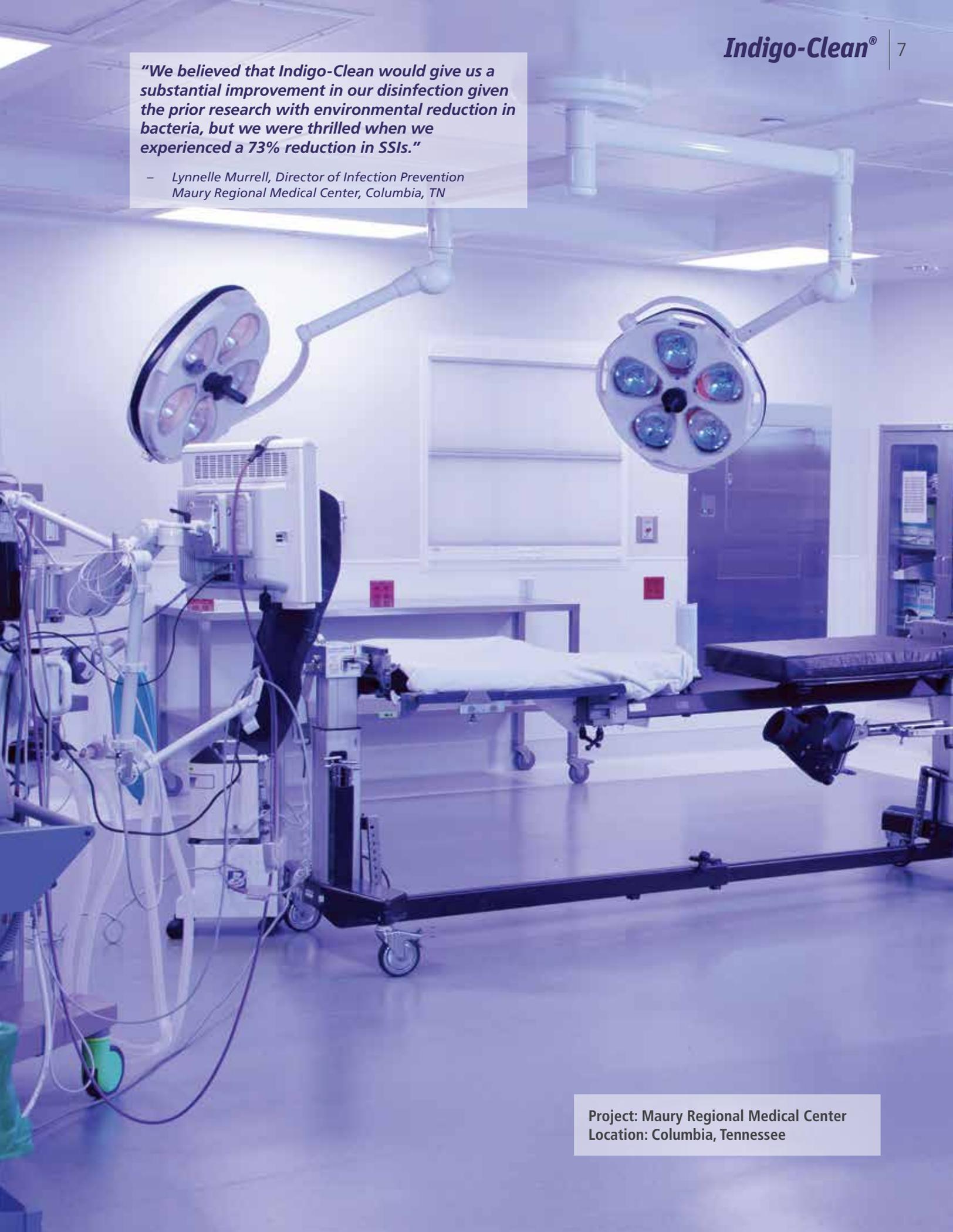
Room	Oct-2015 to Oct-2016		Oct-2016 to Oct-2017		SSI Change	Bacterial Reduction
	# of Cases	# of SSI	# of Cases	# of SSI		
OR-2 (with IC)	778	11	850	3	<b>&gt;=-73%</b>	<b>&gt;=-85%</b>
OR-3 (Distant Control)	751	6	809	7	<b>&lt;=+17%</b>	Not Measured



**Read the AJIC peer-reviewed article at [www.indigo-clean.com](http://www.indigo-clean.com)**

*"We believed that Indigo-Clean would give us a substantial improvement in our disinfection given the prior research with environmental reduction in bacteria, but we were thrilled when we experienced a 73% reduction in SSIs."*

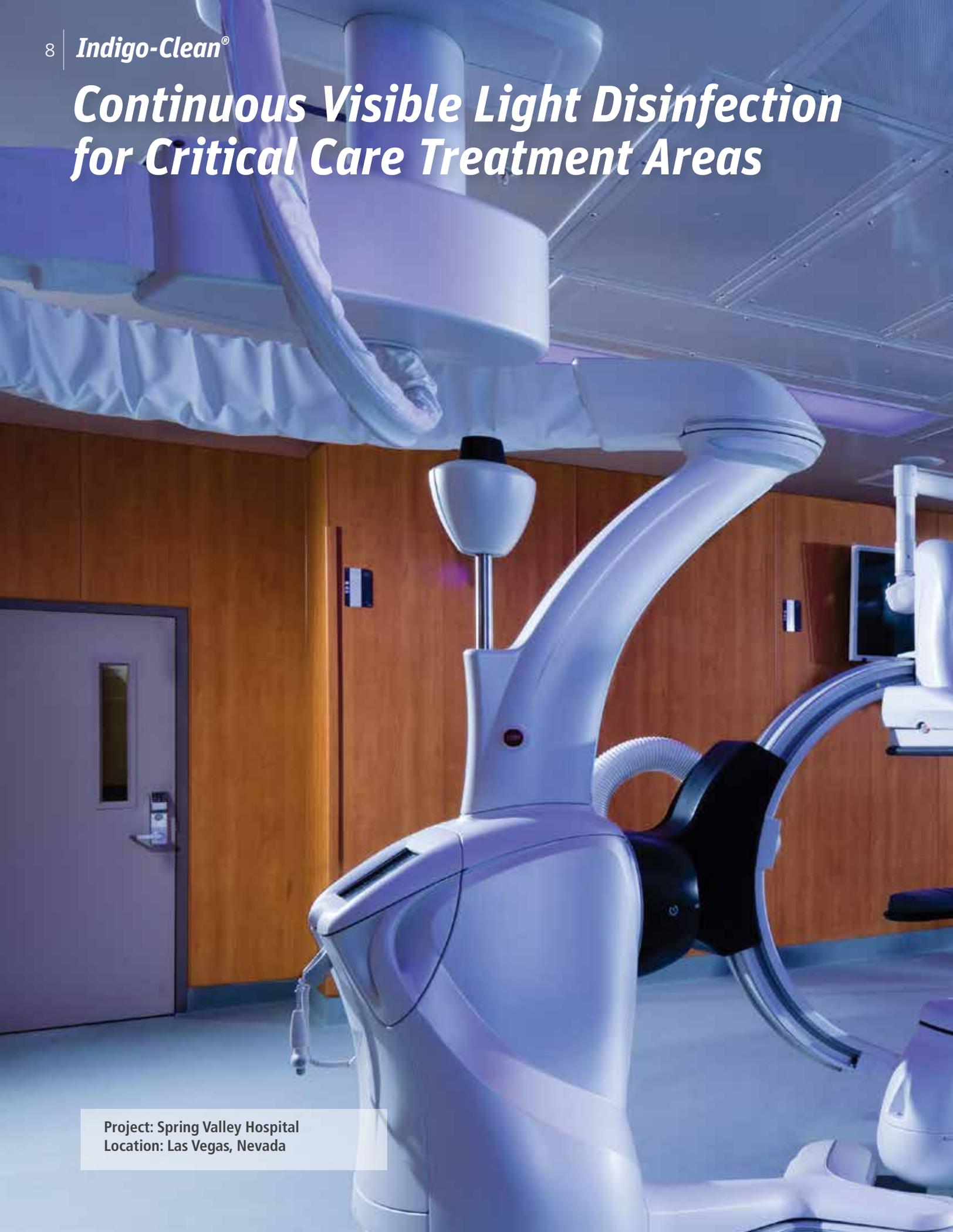
– Lynnelle Murrell, Director of Infection Prevention  
Maury Regional Medical Center, Columbia, TN



Project: Maury Regional Medical Center  
Location: Columbia, Tennessee

# *Continuous Visible Light Disinfection for Critical Care Treatment Areas*

Project: Spring Valley Hospital  
Location: Las Vegas, Nevada





**Reducing Harmful Bacteria and Surgical Site Infections**

Indigo-Clean surgical suite fixtures are dual-mode luminaires that use an occupancy sensor to provide an effortless transition between white disinfection mode when the room is in use, and indigo disinfection mode when the room is not. Both modes provide the continuous environmental disinfection required to reduce harmful bacteria and surgical site infections in busy surgical suites.

**M4SEDIC Series**

- Delivered lumen range: 6,000 – 14,712 lm
- Input power: 69 – 138W
- Two operational modes: White Disinfection Mode & Indigo Disinfection Mode
- High performance LED arrays provide uniform lens appearance
- Diffused high-efficiency lens for reduced glare
- Antimicrobial finish

Nominal sizes:	1' x 4'; 2' x 2'; 2' x 4'
Installation Types:	Grid, flange
Lamp Types:	White LED, 405 nm indigo LED



[www.kenall.com](http://www.kenall.com)

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10200 55th Street Kenosha, Wisconsin 53144, USA

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## Downlights That Disinfect

Indigo-Clean downlights in the surgical suite provide additional luminaire options for maximum disinfection in the room.



### M4DLIC6 Series

- Delivered lumen range: 1,350 – 2,100 lm
- Input power: 34W, 40W

Nominal sizes	6" Aperture
Installation Types	Recessed
Lamp Types	White and Indigo LED



**Kill Harmful Bacteria, Including *C. diff* and MRSA to Keep it from Spreading**

In specified treatment areas, Indigo-Clean luminaires support the patient, the patient care team and the hospital environment by killing harmful bacteria, including MRSA\*\* and *C. diff*, as well as other **ESKAPE** pathogens, when the room is in use. They are also sealed to help prevent the spread of infection, making them ideal for use in emergency departments, waiting rooms, procedure rooms and restrooms.

**MEIC Series**

- Delivered lumen range (white disinfection mode): 3,187 – 9,226 lm
- Input power: 35 – 83W
- Kills 70%+ of harmful bacteria
- Provided with Indigo-Clean (IC100) room control system
- Standard dimming provides flexible light levels

Nominal sizes:	2'× 2', 2'× 4'
Installation types:	Grid, Flange
Lamp types:	White and Indigo LED



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## Kill *C.diff* in Patient Bathrooms

Indigo-Clean downlights are ideal for use in patient restrooms where *C. diff* can be a critical concern.



### MDLIC6 Series

- Delivered lumen range: 1,384 – 2,050 lm
- Input power: 29 – 40W
- Provided IC75 occupancy sensor; switches automatically to maximum disinfection mode when room is unoccupied
- High performance LEDs deliver high visual acuity
- Standard antimicrobial finish

Nominal Sizes:  
Installation Types:  
Lamp Types:

6" Aperture  
Recessed  
White and Indigo LED

**Sporicidal Disinfection  
Kills 70% of *C. diff*  
in 24 hours**

SGS Lab Report# - 09S17053798



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## Two Operating Modes and Proprietary Controls Make Indigo-Clean Automatic



### White Disinfection Mode

Provides comfort and visual acuity, during procedures and cleaning; combines ambient white and indigo light for continuous environmental disinfection.



During periods of occupancy, this IC100 control system is designed to set the Indigo-Clean fixtures into White Disinfection Mode, which provides comfortable white light, yet maintains a level of continuous disinfection to harmful bacteria. After the room has been unoccupied for 15 minutes (factory preset, field adjustable from 3 seconds to 30 minutes), the control system will set the Indigo-Clean luminaires to Indigo Disinfection Mode, which provides maximum disinfection of harmful bacteria.



### Indigo Disinfection Mode

Typically used when the room is not in use. Indigo disinfection mode provides optimal continuous environmental disinfection.



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## Who's Using Indigo-Clean?



"We wanted a disinfectant technology that would be effective, efficient and easy to use, which is exactly what Indigo-Clean is. Compared to other disinfecting technologies on the market, Indigo-Clean was the most cost-effective and efficient since there was no room downtime. And because it's automatic, it alleviates the concern of training and human error."

- **Mike Pankey, Administrator, Ambulatory Surgery Center (ASC) of Spartanburg**



"We chose to invest in Indigo-Clean for our operating room lighting not only because of the proven high antimicrobial rates, but we appreciated the ease of use, and the ability to continuously disinfect our operating rooms without any downtime. That translates into more procedures and more revenue for us."

- **Thomas Ragukonis, MD, Medical Director, New Century Spine & Outpatient Surgical Institute**



"We chose to partner with Indigo-Clean over other disinfecting technologies because of the ease of use and the proven efficacy of the disinfecting lights. We look forward to expanding our usage of Indigo-Clean in other areas of the hospital in the future."

- **Lisa Sherman, Director, Operating Room, Holy Family Memorial**



"Maintaining a safe, clean environment for our patients is our number one priority. Indigo-Clean safely, automatically, and continuously disinfects the environment, which means there is no need for room downtime when it (the operating room) is in use."

- **Sam Kaufman, CEO & Managing Director, Henderson Hospital**



"I wanted to do everything in my power to provide them (student athletes) with the most opportune environment for success. After researching LED disinfectant lighting choices it quickly became clear that the Indigo-Clean Technology was the leader in the industry."

- **Tom Farden, Co-Head Coach, University of Utah Gymnastics**



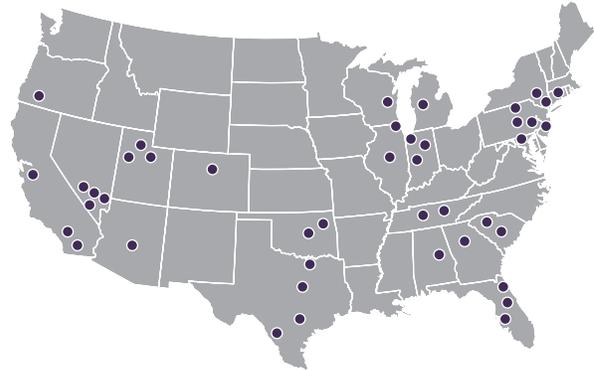
"Providing high-quality patient care, while maintaining a safe, clean environment for our patients is our number one priority. Knowing Indigo-Clean is a proven disinfectant technology, we felt it was important to partner Indigo-Clean with our current cleaning protocols within our new hybrid cardiac suite."

- **Leonard Freehof, CEO/Managing Director, Spring Valley Hospital**

# Nationwide, healthcare facilities are experiencing positive results with Indigo-Clean continuous environmental disinfection.

## Select installations include:

- ASC Spartanburg, Spartanburg, SC
- Beverly Community Hospital, Montebello, CA
- Cherokee Nation Health Center, Tahlequah, OK
- Geisinger Medical Center, Danville, PA
- Henderson Hospital, Henderson, NV
- Henderson OSC, Henderson, NV
- Holy Family Memorial, Manitowoc, WI
- New Century Spine & Outpatient Surgical Institute, Paramus, NJ
- Spring Valley Hospital, Las Vegas, NV
- St. Mark's Hospital, Salt Lake City, UT
- University of Utah, Salt Lake City, UT
- St. Mary's Hospital, Waterbury, CT



## Recommended Use Areas

### Operating Rooms



- Peer-reviewed study reports "statistically significant" reduction in SSIs
- Safe for room occupants, even in Indigo mode
- No technician, training, or consumables required for use

### Emergency Departments



- Receive undiagnosed patients with unknown contaminants
- Indigo-Clean is effective against molds, spores, fungi and bacteria
- Kills harmful bacteria, such as Staph, including MRSA

### Patient Bathrooms



- Hotspot for *C. diff*, which are notoriously difficult bacteria to kill
- Indigo-Clean effectively kills up to 70% of *C. diff* after 24 hrs of use

### Procedure/Exam Rooms



- Augments current cleaning protocols in high-turnover areas
- Operates in white disinfection mode while room is occupied
- Automatically switches to Indigo disinfection mode when room is empty

### Hospital Pharmacies



- Risk area for bacterial contamination
- Contains a number of high touch surfaces; subject to crowding and fast paced activities
- Indigo-Clean provides an ideal disinfecting solution between cleanings

## Listings, Certifications

Fixtures designed for use in healthcare settings must satisfy a large number of demanding lighting and environmental requirements. Listings applicable to these requirements are shown below. Please refer to the [www.indigo-clean.com](http://www.indigo-clean.com) to determine product specific listings.



**ADA Compliant**—Although ADA is not specific to lighting, it does impact fixture design by creating standards for wall sconce projection space and hanging light clearance. Section 4.4 of the ADA states that "objects projecting from walls with their leading edges between 27" and 80" above the finished floor shall protrude no more than 4" into walks, halls, corridors, passageways or aisles."



**CCEA Approved**—The City of Chicago Environmental Air (CCEA) rating ensures that the luminaire is inherently airtight. Wiring and/or branch circuit terminations are sealed off and gasketed from the plenum air space. This listing ensures that the luminaire is sealed to limit air flow from the room side to the plenum.



**ETL**—A product bearing the ETL Listed Mark is determined to have met the minimum requirements of prescribed product safety standards as certified by a Nationally Recognized Testing Laboratory (NRTL). The mark also indicates that the manufacturer's production site conforms to a range of compliance measures and is subject to periodic follow-up inspections to verify continued conformance.



**IP64**—UL Certified IP64 per IEC 60598 ensures that the enclosure is dust-tight and protected against splashing water without any harmful effects.



**IP65**—UL Certified IP65 per IEC 60598 ensures that the enclosure is dust-tight and protected against jet streams of water from any direction without any harmful effects.



**ISO 5** — Suitable for ISO 5, Class 100 Rated Rooms (FED-STD209E). Measures the number of particles equal to or greater than 0.5 mm in one cubic foot of air. The measurement must not exceed specified particle limits in order for the space to be considered a controlled 'clean room' environment.



**MIL STD 461G**—Military Standards testing measurements cover both radiated and conducted electromagnetic emissions in addition to maximum allowable amounts of emitted energy based on both frequency range and field strength. Luminaires meeting MIL STD 461G pose the lowest possible likelihood of causing EMI-related issues.



**NSF2**—An NSF2 Listing denotes that the luminaire has been evaluated for corrosion resistance, cleanability and the ability of exposed material to withstand normal wear. This supports the infection control standards established by healthcare facilities as it indicates that the luminaire is easy to sanitize.



**NSF P495**—NSF Indigo-Clean conforms to NSF P495-2018, a new standard of cleanliness that validates the disinfection of surfaces via narrow spectrum visible light (400nm – 420nm) in a controlled environment. The P495 certification demonstrates a statistically significant reduction of *Staphylococcus aureus* and/or *Clostridium difficile* endospores on clinically relevant surfaces, such as stainless steel and laminate. Light fixtures must also be NSF2 compliant.



**UL/CUL Listed**—The UL symbol signifies that Underwriter's Laboratory (UL) has determined that a manufacturer has demonstrated the ability to produce a product complying with UL's requirements with respect to specific risk, performance under specific conditions, compliance with regulatory codes and specified standards, or any other conditions as determined by UL.

## Warranties

On behalf of our valued customers, Kenall promises to stand behind our luminaires. Our commitment to excellence enables us to offer a variety of product warranties, including the Kenall exclusive Peace of Mind Guarantee, 5-year LED and 10-year limited product warranty. For more detailed, product specific warranty information, please visit our website at [www.kenall.com](http://www.kenall.com).



### LED 5-year Warranty

Kenall offers a limited 5-year LED warranty on LED products. For complete warranty information, please visit us on the web at [www.kenall.com](http://www.kenall.com).



Kenall's luminaires are expertly designed in our state-of-the-art, vertically integrated, static-controlled manufacturing facility in Wisconsin. This enables us to provide tight control over the entire development process from fixture design and engineering to full-fledged metal fabrication, paint, assembly and shipping. We also take great care in sourcing only the highest-quality components to assure optimal product performance.

Our products comply with the Buy American Act, which is your best assurance of quality, consistent delivery and protection for United States jobs.



**Buy American Act Compliant**





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