

White LED Lighting: Coming To An Office Near You

LEDs are commonly used in a wide variety of applications such as displays, exit signs, traffic signals, automotive lights, and architectural settings in which color changes are desirable. However, only recently have white LEDs been used for general, ambient lighting, and many of the benefits of using LEDs to illuminate general spaces are not widely known.

This Technical Bulletin outlines a number of the benefits of using white LEDs to illuminate general architectural spaces such as executive offices, conference rooms, corridors, lobbies, and retail stores.

Energy Efficiency

Gallium's high output, cool white (5100K) LED luminaires offer energy efficiency surpassing that of most specification-grade, 26 watt compact fluorescent luminaires (CFLs). During 2007, new higher-efficiency LEDs are expected to bring CFL efficiency to even the warmest color temperatures, and Gallium high output, cool white luminaires **will offer significantly higher efficiency than CFLs**.

Long Life

The emerging standard for rating LED life is based on the length of operation at which an LED luminaire provides 70% of initial lumens. Using this approach, Gallium LED life is rated at **40,000 hours, which equates to twenty years of useful service** when operated during regular business hours.

Eco-Friendly

Due to the long life expectancy of LEDs, these components are infrequently discarded, reducing the burden of already crowded landfills. Further, **LEDs contain none of the mercury found in fluorescent lamps**, so LEDs are preferred by those concerned with the environment.

The Preferred Choice With Occupancy Sensors

As explained in Gallium's *Technical Bulletin*, "LEDs & Occupancy Sensors," **the life expectancy of LEDs is not shortened when they are frequently switched**, as occurs with occupancy sensors. In contrast, the life expectancy of compact fluorescent lamps declines significantly when frequently switched.

Durability & Shock Resistance

Since LEDs have none of the fragile glass coverings or filaments characteristic of convention lamps, **LEDs can withstand physical shocks that would shatter conventional lamps**. For this reason, LEDs are clearly preferred in applications where vibration and other shocks are possible, such as elevators.

Immediate, Flicker-Free Start-Up

Gallium LEDs **come to full brightness without any of the flicker or delay characteristic of fluorescent lamps**, even when they are frequently switched on and off, and even in cold environments.

Full Architectural Dimming Down to 0%

Gallium is proud to present LED luminaires with **full architectural dimming down to 0%**. Gallium dimming systems are operated with standard incandescent wallbox dimmers, and provide smooth, flicker-free transitions across the entire range of light levels. Gallium plans to introduce dimming during the summer of 2007.

Definitions

LED Life: The emerging standard for rating LED life is based on the length of operation at which an LED luminaire provides 70% of initial lumens. However, the light output of LEDs typically declines gradually over an extended period that may last 100,000 hours or more.

Color Rendering Index (CRI): A widely accepted measure of the ability of a light source to render the colors of objects lit by the light source as the colors would be seen if illuminated by an incandescent lamp.

For More Information

Mercury Poisoning: For more on the harmful effects of mercury poisoning, see:

www.mercuryexposure.org

<http://www.fda.gov/fdac/reprints/mercury.html>

Harmful Effects of Ultraviolet (UV) or Infrared (IR) Radiation: For more on the harmful effects of UV and IR radiation, see:

IEC (1995). Safety of household and similar electrical appliances. Part 2: Particular requirements for appliances for skin exposure to ultraviolet and infrared radiation. Geneva: IEC 335-2-27.

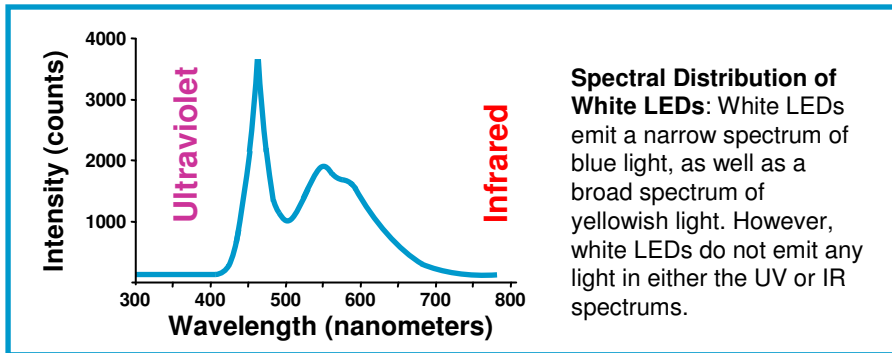
LEDs & Occupancy Sensors: See Gallium Lighting's *Technical Bulletin* (Volume 1, Issue 1, March 19, 2007) at:

<http://www.galliumlighting.com/wp-content/uploads/2007/04/leds-occupancy-sensors-final.pdf>

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No Ultraviolet (UV) or Infrared (IR) Emissions

As shown in the chart below, white LEDs emit a narrow spectrum of blue light, as well as a broad spectrum of yellowish light due to the addition of phosphors. However, white LEDs do not emit any light in either the UV or IR spectrums. As a result, white LEDs are both safe and efficient.



Excellent Color Rendering

Standard Gallium LEDs provide a color rendering index (CRI) comparable to standard compact fluorescent lamps. Gallium is also proud is present **the availability of high-CRI LEDs, with CRI of up to 92.**

Silent Operation

Gallium LEDs provide silent operation with **none of the ballast or filament hum characteristic of some conventional lighting technologies.** This feature makes Gallium the preferred choice in demanding environments such as recording studios and concert halls.

Cool Operation

The external housing of Gallium luminaires operates at temperatures only slightly above that of the surrounding environment, which reduces the demand of HVAC resources required to keep the environment cool.

Sparkle

Gallium LED luminaires provide attractive **sparkle on highly reflective surfaces such as jewelry display cases and marble floors.** This feature can be used to create interest and aesthetic appeal.

Conclusion

With long-term estimates of LED efficacy at 150-200 lumens per watt, white LEDs are virtually certain to offer lighting professionals significant benefits for lighting general, ambient settings. However, white LEDs offer more than just long life and the promise of unparalleled energy efficiency. As outlined in this *Technical Bulletin*, white LEDs are also eco-friendly, safe, an excellent choice when occupancy sensors are used, durable and shock-resistant. White LEDs also provide a number of attractive features such as immediate, flicker-free start-up, excellent color rendering, silent and cool operation, and full architectural dimming down to 0%. Finally, LEDs can also create interest and aesthetic appeal by producing sparkle on highly reflective surfaces.

About Gallium

Gallium is dedicated to leading the way into the new era in lighting technology. Gallium's state-of-the-art, specification-grade LED lighting systems produce a brilliant white light. Featuring optical systems designed especially for illuminating general architectural spaces, Gallium LED lighting systems make a distinctive statement while providing unprecedented energy efficiency.

The Gallium Advantage

- Long Life
- Energy Efficient
- Directional Light Distribution
- Environmentally Friendly
- Safe, Reliable & Durable
- Long-Term Cost-Effective Operation
- Cool Operation

Author's Biography

Dr. Keith Bahde is the President of Gallium Lighting. He has 20 years of lighting industry experience with three of the four largest lighting fixture manufacturers in North America. Keith founded Gallium Lighting to accelerate the adoption of LED technology in mainstream architectural applications. His academic credentials include an MBA and a PhD.

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