KENALL®

THE COMPETITIVE +EDGE

Issue #4

570nm Amber Light In Scientific Application

The Advantages of Using 570nm Amber Light in Scientific Applications

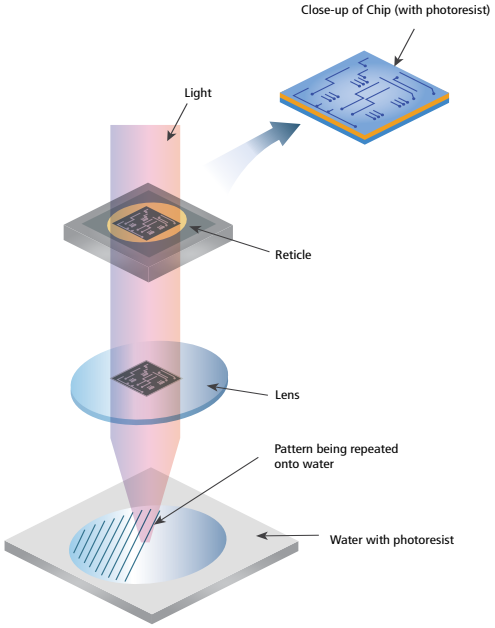
Greater sophistication in Solid-State Lighting (SSL) technology now means lighting designers can employ a variety of narrow-spectrum LED wavelengths for specialized scientific, medical and manufacturing uses. Kenall is at the forefront of developing these narrow-spectrum lighting applications for cleanrooms, laboratories, healthcare facilities, and food and pharmaceutical production. Specifically, 570nm amber light is used to avoid UV exposure in photochemically sensitive applications.

Why Narrow Spectrum Lighting?

Previously, when these types of facilities required the use of a particular color or wavelength of light, it was achieved through the use of white light paired with colored filters, which, over time, degraded and failed. The advent of SSL now allows these wavelengths to be produced without filters, creating a far more accurate, reliable and energy-efficient product. Kenall currently produces light fixtures containing four different narrow-spectrum sources, each with their own unique application:

- Indigo Clean™ 405nm provides continuous environmental disinfection for healthcare facilities
- 530nm green LED reduces eye strain in operating rooms
- 630nm red LED preserves the circadian rhythms and natural behaviors of animals in vivariums

Detailed information about each of these wavelengths can be found on the Kenall website. Below is a more in-depth discussion about Kenall's fourth color offering, 570nm amber.



Why Use Amber Light?

Narrow-spectrum amber light is used in applications where photochemically sensitive materials are being used or manufactured, in order to prevent unintentional UV exposure. Intel's CORE-I7 processor chips are built with circuitry measuring 14 nanometers — half the size of a virus. In order to make such small circuits, manufacturers use lithography, a printing process similar to photography. Coatings or emulsions are placed on the product surface and a positive or negative image of the desired structure is miniaturized and projected onto the substrate using UV light. The UV light changes the coating into a solid, allowing the unexposed area to be washed away. The resulting hardened structure is typically just one layer of many within a semiconductor that makes up the circuit pathways or transistors.

A similar process is used in nanotechnology, where machines called microelectromechanical systems (MEMs) and nanoelectromechanical systems (NEMS) are created on the molecular level, and can be as small as a bacterium. One manufacturing method uses a 3D printer and liquid resin, which is hardened at the correct spots with a focused laser beam, to create a MEM or NEM. The focal point of the laser beam is guided through the resin by movable mirrors and leaves behind a hardened line of solid polymer, just a few hundred nanometers wide. This fine resolution enables the creation of intricately structured sculptures as tiny as a grain of sand. Since this process uses photoactive resins, which are cured by laser light, care must be taken to limit the exposure to ordinary light. Narrow-spectrum amber light provides comfortable, ambient light for the technicians, while preventing the premature hardening of UV-, blue- and green-light sensitive polymers. This extends work time and improves product quality.

Narrow-spectrum amber light also protects sensitive biological work, research and medical treatments. Although ordinary light does not have a negative effect on large organisms, it can damage DNA or create unwanted chemical reactions in individual live cells. The smaller the structure, and the more exposed to ordinary light, the more negative effects can be seen. The restricted spectrum of light found in Kenall's CSEDO-Amber light fixture helps provide improved outcomes during in-vitro fertilization and stem cell transplant work.

Finally, amber light also protects pharmaceuticals during manufacture and storage. UV and some short-wavelength visible light can create unwanted chemical reactions, prematurely degrading medications.

Because each of these situations demands a high standard of cleanliness and ingress protection, in addition to a special wavelength of light, Kenall's Narrow-Spectrum LED products utilize the best attributes of our white-light sealed fixtures and deliver them in switchable luminaires. This allows sensitive processes to continue, or even improve, unhindered by ordinary ambient light.

For more information about Kenall's 570nm amber luminaires for scientific applications, contact us at www.kenall.com.