Klaran UVC LEDs for Disinfection in Consumer Appliances

Crystal IS
High Performance UVC LEDs

There is growing concern and awareness of the need for greater diligence by consumers when it comes to the water they drink, air they breathe and food they eat.

The media continues to highlight breakdowns in public utility systems and food and beverage industry processes that are allowing contamination to bypass checkpoints and continue into the home. In addition, as the trend for locally-sourced goods grows, products are being purchased outside the control of regulatory agencies like the FDA and EPA. This passes the burden of ensuring safety onto the consumer—and by extension is driving a demand for added water, air and food security in consumer appliances and products.

Product innovators and consumer appliance manufacturers are seeking new ways to add enhanced protection against contamination. Whether it is adding an additional level of disinfection to a smart appliance in a US home or improving access to clean drinking water in remote regions of Africa or Asia Pacific, the ability to make high levels of disinfection accessible is enabling innovation in these areas. Just as mobile communications allowed the developing world to leapfrog infrastructure development and bring connectivity to remote areas, new disinfection products enabled with Klaran UVC LED technology can bring safety into these areas without depending on municipal infrastructure or industrial processes.

HEALTHY BENEFITS

Delivered by Klaran UVC LEDs

This trend for products that improve water, air and food quality while remaining simple, easy-to-use and effective is coupled with a consumer rebellion against harsh chemicals. So while it is recognized that frequent disinfection is required to ensure efficient performance and prevent microbial growth for most home conveniences and smart appliances, many consumers are not employing regular, proper disinfection as part of their general product maintenance. The integration of UV disinfection into these products provides both an additional layer of protection and enhances the product's core disinfection capability.

Germicidal UVC light, which represents a portion of the UVC spectrum from 250 nm – 280 nm, is proven to destroy nucleic acids within microorganism DNA, thereby rendering them unable to reproduce. While most chemical disinfectants damage only the cellular structure of a microbe, UV disinfection does more.

UV Lamps Versus UVC LEDs

Traditionally, this part of the UV spectrum was accessed using mercury lamps. However, LEDs that emit light in the UVC wavelength range have emerged and provide significant design advantages over mercury lamps. Not only are they compact and durable, they provide design engineers with greater flexibility and creativity to add disinfection functions without compromising product aesthetics.

UVC LEDs offer:

» Compact, shock resistant, durable packages

» Simple electronics capable of battery operation and instant on/off

» Environmentally friendly package

ULTIMATE DESIGN FLEXIBILITY

	Designs using Mercury Lamp	Designs using UVC LEDs
Package	Fragile glass envelope must be enclosed in a shock resistant package to reduce the risk of lamp breakage. As the lamp is a long, cylindrical shape, the disinfection unit must conform to the lamp footprint.	Durable, compact package without any hazardous materials enables design creativity. The small footprint of the LED allows the disinfection to conform to the target—not the other way around.
System	Required ballast, electronics and heat shielding lead to bulky components and systems. Warm up time required for disinfection, consequently most systems are left on with a continuous energy draw.	Smaller, simpler electronics reduces components allowing for more portable systems. On-demand disinfection reduces energy consumption and enables speed of disinfection.
Sustainability	Lamps contain hazardous mercury, requiring special handling for yearly replacements.	LEDs do not contain any hazardous materials and are RoHS compliant, allowing them to fit with consumer's environmental concerns.

Klaran UVC LEDs Improve Air Quality

While HVAC systems afford year round comfort to consumers if left unattended, they can also be a major contributor to the production and distribution of mold. Whether accumulating on the device coils to create a biofilm or growing within humidifiers or dehumidifiers, under the right conditions mold spores can multiply and affect air quality—impacting the efficiency and effectiveness of these units.

KLARAN ENABLES HEALTHLIER, MORE EFFICIENT AIR DISINFECTION SYSTEMS:

- Durable, compact footprint and directional emission allows UV disinfection to conform to system size and shape
- Instant on/off allows for intermittent operation which optimizes energy consumption

Empowering Consumers to Rethink Water Quality

Population growth, increased demand and shrinking water tables collectively place a heavy burden on municipalities and water utilities to maintain service and aging infrastructure while coping with tight budgets.

Reports continue to appear around the world regarding water main failures in communities or in extreme cases entire water supplies becoming compromised and unsafe to drink. Whether at the Point of Entry (POE) to the home or at the Point-of-use (POU), consumers are recognizing the need to take a more active role to ensure clean, safe drinking water in their homes.

UVC LEDs provide the design flexibility to create compact, cost-effective solutions that can be integrated into a variety of shapes and sizes for POE and POU systems.

KLARAN ENABLES SAFER WATER FOR CONSUMERS:

» Compact footprint with directional light emission allow for greater efficiency and smaller system size that can be integrated at any point in the home.

» Simple electronics and instant operation allow for on-demand disinfection to meet the drinking water needs of families without dramatic increases in energy costs.

THE UVC LED SOLUTION

Crystal IS manufactures high performance UVC LEDs that are integrated into our customers' products to disinfect water, air and surfaces in a variety of applications. These UVC LEDs are manufactured on our low-defect density, single crystal aluminum nitride (AlN) substrates and our proprietary technology in crystal growth. The resulting devices have higher light output and greater reliability than other commercial UVC LEDs.

Discover how UVC LEDs can help today. Contact us.

Crystal IS™
High Performance UVC LEDs

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