GERMICIDAL LIGHTING

PRODUCT COMPLIANCE REQUIREMENTS AND SOLUTIONS

Intertek's experience and expertise in lighting provides confidence and peace of mind to manufacturers and users of germicidal lighting across a variety of applications.

Germicidal Lighting

Germicidal lighting equipment refers to products designed to produce light output in a range that may kill organisms and bacteria that cause infectious disease. These fixtures are used in healthcare facilities, air filtration systems, and other applications worldwide to help prevent the spread of pathogens.

Evidenced by a growing list of infectious diseases such as Ebola, SARS, Coronavirus-19, measles, and antibiotic-resistant infections, highly contagious diseases can develop anywhere and put global populations at risk. In response, facilities have stepped up measures to contain diseases using specialized personal protective equipment (PPE), clean rooms, negative air-pressure isolation areas, and germicidal lighting.

Germicidal fixtures can rely on light sources such as fluorescent, light emitting diode (LED), and high intensity discharge (HID) technology, but are specially designed to emit energy that can be defined to a specific nanometer region to address bacteria unique to each disease.

Germicidal Lighting Evaluation Requirements & Testing

As the industry evolves there are various Standards Development Organizations (SDOs) actively involved in developing new standards to address safety and performance requirements for this technology. Intertek engineers are actively engaging with the manufacturing community and the various SDOs to support the standard development.

Safety & Certification Requirements

There is currently no one standard specific to all germicidal lighting products. Intertek certifies products using the best applicable global standard(s), based on the specific application and installation method.

Below are examples of standards that may be used to support North American safety certification of such products:

- Fixed Luminaires to UL 1598/CSA C22.2 No. 250
- Portable Luminaires to UL 153/CSA C22.2 No. 250.4
- Furnishings to UL 962
- Laboratory Equipment to UL 61010-1/ CSA C22.2 61010-1
- Self-Ballasted Lamps to UL 1993/CSA C22.2 No. 1993
- Photobiological testing to IEC 62471

Performance Requirements

Depending on the product construction and intended application, a variety of performance standards could apply.

For the majority of products, the following will apply:

- IES LM-58-13 Spectroradiometric Measurement Methods for Light Sources

HID Lighting

- IES LM-51-13 Approved Method for Electrical and Photometric Measurement of High Intensity Discharge Lamps
- IES LM-46-04 Photometric Testing of Indoor Luminaires Using HID or Incandescent Filament Lamps

LED Lighting

- IES LM-85-14 Electrical and Photometric Measurements of High-Power LEDs
- IES LM-79-19 Approved Method: Optical and Electrical Measurements of Solid-State Lighting Products
- IES LM-80-15 Measuring Luminous Flux and Color Maintenance of LED Packages, Arrays and Modules
- CIE S 025-E:2015 Test Method for LED Lamps, LED Luminaires & LED Modules

GERMICIDAL LIGHTING

Germicidal Ultraviolet (GUV) Lighting Requirements & Testing

GUV lighting, also known as GUVL, or UVGI lighting, requires testing and certification to ensure it complies with industry standards, can be legally sold and utilized by healthcare providers, and is safe for use in the public domain. GUV lighting is evaluated with the applicable UV illumination source and with software to generate data on the light distribution, direction, and coverage area.

Applicable regional standards are considered, such as a UL or CSA standards for North America, SATS standards in South Africa, or IEC standards globally.

South Africa SATS 1706:2016 standard

This standard is specific to GUV fixtures. The goal of the standard is to establish safety and performance requirements for fixtures used to disinfect indoor air. SATS 1706 includes requirements for:

- Operating temperatures
- Resistance to dust, solid objects, and moisture
- Mechanical strength
- Resistance to corrosion
- Limitation of audible noise
- Radiation testing

IEC 62471 Photobiological Requirements

Due to the potential risks associated with some GUV lighting products, this standard may be used to assess the UV, visible, and infrared region of the light spectrum to determine whether it will be an irritant, a hazard to human body tissues, how long users or patients can be exposed, and/or if protective eyewear is required.

GUV Testing Solutions

Intertek provides GUV fixture testing and certification to assist manufacturers developing products and to ensure they meet regulatory requirements and protect the health and safety of users.

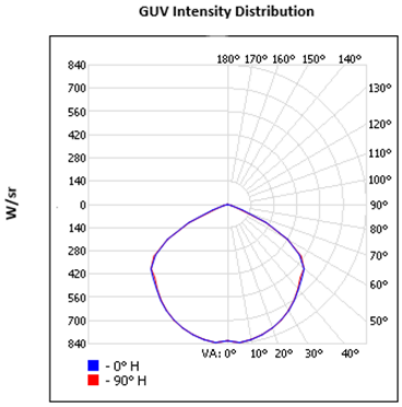
Intertek provides testing to SATS 1706 and IEC 62471 and utilizes these requirements as guides for GUV fixture testing in other markets.

We also offer services that provide manufacturers in-depth insights into the safety and performance of their fixtures:

- Spectral Analysis: Evaluates type of radiation emitted (UVA, UVB, or UVC), and if it presents a health hazard.
- Distribution Testing: Evaluates direction of radiation to help ensure it is not focused towards people.
- Graphical representation and radiant intensity matrices are provided for guidance on the number and position of fixtures needed within a space.

GUV Sample Testing Output

Test plans depend on the fixture type, intended use, and specific performance expectations. An engineering review is conducted for each product to determine testing and data collection.



Sample polar plot

Considerations for Use Environment & Intertek Services to Support

Depending on where these products are installed, additional considerations must be evaluated. For example, lighting in healthcare environments must be assessed for use near magnetic resonance imaging (MRI) equipment. Other settings may require testing for electromagnetic compatibility (EMC) and electromagnetic interference (EMI).

A design evaluation will determine the performance and safety criteria which may apply to your specific product.

Intertek's global network of experts assess a wide variety of equipment, chemicals, people, and processes to meet the rigorous quality standards of healthcare environments, including:

- Personal Protective Equipment (PPE)
- Medical Devices
- Chemicals & Pharmaceuticals
- Nanomaterials
- Scientific Support Services
- Clinical Research Services
- Hazardous Location Assessments
- Global Supply Chain Compliance
- Auditing and Systems Certification
- Design for Compliance Support

About Intertek

Intertek is a leading Total Quality Assurance provider to industries worldwide. Our network of more than 1,000 laboratories and offices and over 46,000 people in more than 100 countries, delivers innovative and bespoke Assurance, Testing, Inspection and Certification solutions for our customers' operations and supply chains. Intertek Total Quality Assurance expertise, delivered consistently with precision, pace and passion, enabling our customers to power ahead safely.

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