LIGHTING

Horticultural (Grow) Lighting

UL can help differentiate your horticultural lighting equipment from general lighting products by providing safety, performance and reliability testing specifically designed for the grow environment.

UL is committed to providing service and knowledge to horticultural lighting manufacturers and actively participates in the development of horticultural specific test methods and performance standards from the American Society of Agricultural and Biological Engineers (ASABE).

Safety

In early May of 2017, UL published new safety requirements for lighting equipment intended for horticultural use. UL's new Outline of Investigation for Horticultural Lighting Equipment, UL 8800, includes specific requirements for installation instructions, markings, supply wiring methods, environmental ratings that include damp and wet locations, exposure to excessive dust and water (IP rating), supplementary requirements for light sources, photobiological safety assessment, and testing. This equipment is intended for installations in accordance with the NEC – NFPA70 for the U.S. market and CAN/CSA-C22.1, Canadian Electrical Code, Part I (CEC), for the Canadian market.

Photobiological Safety

Plants require different wavelengths of light than those required for general illumination. Light sources for the grow environment commonly produce light in the Ultraviolet (UV), deep blue and Infrared (IR) wavelength regions. While these wavelengths of light are important for plant growth, they can potentially be harmful to people. Skin exposure is considered, but the larger concern is the effects of these wavelengths on the human eye. Due to this concern, a photobiological safety assessment is conducted across the full wavelength range of light produced by the light source within the luminaire at a 20 cm distance between the light source and the measuring instrument. This testing is conducted in accordance with the requirements in IEC 62471, *Photobiological Safety of Lamps and Lamp Systems*. Based on test results, the "risk group" of the light source is determined and the corresponding cautionary markings required on the luminaire and in the installation instructions are established.

To learn more about our capabilities and speak with UL's technical experts, contact us at LightingInfo@UL.com

Performance

Separate from the safety requirements noted above, lighting for horticultural and agricultural products has a significant impact on the yield of the installation, which makes understanding the quantity, distribution and spectrum of the light even more important. Having the right spectrum and quantity of light at the right point in the plant lifecycle can make a significant difference in the quality of the end product (i.e. can influence plant growth characteristics). However, the optimal spectrum and intensity for one species of plant may not be optimal for other species, and the details of the spectrum can make a difference.

Based on feedback from stakeholders and UL's participation in industry organizations working to develop standards and measurement methods, UL now also offers measurement of horticultural lighting products. As part of this measurement service, UL developed an industry specific test report to provide an objective measure of performance. This report includes the following key metrics that a grower needs to make the best choice of light for their product:

- A 350-800nm spectral distribution, acknowledging chlorophyll is not the only photo reactive chemical in plants, to illustrate a better picture of what light output a product is providing
- Photosynthetic photon flux (PPF) binned into 10 nm ranges to better illustrate the spectrum
- PPF output and efficacy
- Optional photosynthetic photon flux density (PPFD) distribution information

Ingress Protection Test (IP)

The Ingress Protection testing classifies and rates the degree of protection provided against the intrusion of dust and water. IP ratings are defined as IPXX, where the first X indicates the degree of protection against solid objects (ranging from 0-6) and the second X indicates the degrees of protection against water (ranging from 0-8) as described in IEC 60529, *Degrees of Protection Provided by Enclosures*.

DEGREES OF PROTECTION AGAINST SOLID OBJECTS	
IP0X	Non-protected
IP1X	50mm diameter and greater
IP2X	12.55mm diameter and greater
IP3X	2.5mm diameter and greater
IP4X	1.0mm diameter and greater
IP5X	Dust-protected
IP6X	Dust-tight

DEGREES OF PROTECTION AGAINST WATER	
IPX0	Non-protected
IPX1	Vertically falling water drops
IPX2	Vertically falling water drops with enclosure tilted
IPX3	Spraying water
IPX4	Splashing water
IPX5	Water jets
IPX6	Powerful water jets
IPX7	Temporary immersion
IPX8	Continuous immersion

To learn more about our capabilities and speak with UL's technical experts, contact us at LightingInfo@UL.com