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HORTICULTURAL LIGHTING
TESTING & CERTIFICATION

Overview of North American Regulatory Requirements

Intertek's horticultural lighting testing, certification, and Total Quality Assurance services help manufacturers develop products in compliance with the safety and performance requirements unique to this growing marketplace.

Horticultural Regulatory Overview

The global market for LED horticultural luminaires, or "grow lights," is an expanding market on pace to grow more than 25% annually, reaching $1.9 billion by 2021.

Horticultural or grow lighting products are defined as luminaires intended to be installed in a horticultural application either above the canopy or intracanopy.

Unlike general lighting, which is tested to IES LM-79 for performance characteristics, horticultural luminaires require additional safety and performance assessments.

In August 2019, harmonized standards ANSI/CAN/UL 8800, were published for the US and Canada to support manufacturers in certifying and selling lighting products and accessories, such as wire harnesses and similar, for horticultural lighting applications.

As safety and performance standards specific to horticultural lighting continue to evolve, Intertek has a variety of testing, assessment, and certification options to guide manufacturers through all applicable requirements, considering multiple current standards, as well as those still in development.

Safety Requirements Specific to Horticultural Luminaires

ANSI/CAN/UL 8800 is now the primary North American safety standard for horticultural lighting. The scope and compliance requirements of this standard are detailed below.

Elevated Ambient Requirements

It is common for horticultural luminaires to be used in elevated ambient conditions; therefore, the temperature test is conducted at the rated ambient rating instead of 25°C. All horticultural luminaires shall comply with the following requirements:

- Be subjected to the temperature test of ANSI/UL 1598/CSA C22.2 No. 250.0
- Be subjected to the abnormal temperature test of ANSI/CAN/UL 8800 (units with motors)
- Be marked in accordance with Table 20.1.1, Item 1.6 of ANSI/UL 1598/ CSA C22.2 No. 250.0.

Photobiological Safety Requirements

The risk group classification from the photobiological safety assessment from IEC 62471 shall be Risk Group 0 (Exempt), Risk Group 1 or Risk Group 2. Risk Group 3 is not permitted.

Humidity Requirements

Horticultural luminaires shall be rated suitable for "damp" or "wet" environment per ANSI/ UL 1598/ CSA C22.2 No. 250.0. Horticultural LED luminaire components are subject to high-humidity environments and must therefore comply with the humidity requirements of UL 8750/CSA C22.2 No. 250.13.

Ingress Protection Requirements

All luminaires must be rated damp or wet and, shall comply with both the rain and sprinkler tests of Clause 13.4.8 of ANSI/ UL 1598.

- Based on installation type, the luminaire shall comply with requirements of LOC-3, LOC-4, LOC-5, or LOC-6 of Table 13.4.8.1 of ANSI/UL 1598.
- A luminaire exposed to dust and water can be marked with an IP code of IP 54 or higher rating from IEC 60598-1 and this IP rating may be included in the "Other Ratings" section of the Intertek certification report. ANSI/UL 1598/CSA C22.2 No. 250.0.

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Enclosure UV Exposure Requirements

- Horticultural luminaires utilizing polymeric enclosures shall comply with the requirements of ANSI/UL 1598/CSA C22.2 No. 250.0 or UL 746C/CSA C22.2 No. 0.17.
- Horticultural luminaires utilizing polymeric material for a water shield shall comply with Clause 14.4.4 of ANSI/UL 1598.
- Gasket material relied upon to comply with the ingress or corrosion protection shall comply with the requirements of Clause 14.4.5 of ANSI/UL 1598, with the exception that operating temperature shall be based on requirements in the elevated ambient condition specifications.

Supply Connection Requirements

- Horticultural luminaires shall be provided with an outlet box for fixed wiring applications or be provided with a cord.
- Cord connected luminaires shall have a flexible cord of at least the hard usage type.
- Cord connected luminaires shall not be provided with a plug unless meant to be permanently mounted to a building with the plug suitably rated for the environment. Considerations should be made for elevated ambient, corrosion & high humidity.

Corrosion Requirements

Requirements for corrosion are still in development. However, due to the potentially corrosive environments where these luminaires can be installed, in addition to the requirements in Clause 5.6 of ANSI/UL 1598, a horticultural luminaire may also meet:

- Requirements for outside-type (nonfreshwater) fixtures in Clause 4.1.d or 4.2.b of ANSI/UL 1598A.

Performance Requirements Specific to Horticultural Luminaires

Intertek experts actively participate with the industry organizations developing performance requirements and sit on the relevant committees. Manufacturers can rely on our expertise to help guide them through current requirements as well as those still in development.

American Society for Agricultural and Biological Engineers (ASABE)

Industry associations such as ASABE are developing standards specific to the performance of horticultural and agricultural lighting applications, such as ANSI/ASABE S640, S642, and the upcoming S644. The scope of these documents is as follows:

- ASABE S640 Standard – Quantities and Units of Electromagnetic Radiation for Plants (Photosynthetic Organisms) – published July 2017
- ASABE S642 Standard – Recommended Methods of Measurements and Testing for LED Radiation Products for Plant Growth and Development Standard – published October 2018
- ASABE X644 Draft Standard – Performance Measures of Electromagnetic Radiation Systems for Plants. Scope: Provides guidance on measures for reporting electromagnetic output and efficacy of individual luminaires used for plant lighting applications (not for bare lamp measurements).

The DesignLights Consortium® (DLC)

Energy efficiency rebate programs, such as DLC, are also engaged in developing programs to support the marketplace. DLC requirements for horticultural products include the following:

- Reported Metrics
  - Photosynthetic Photon Flux (PPF)
  - Far-Red Photon Flux (PFFR)
  - Spectral Quantum Distribution (SQD)
  - Photosynthetic Photon Intensity Distribution (PPID)
- Required Minimums
  - Photosynthetic Photon Efficacy (PPE) (µmol/J)
  - Photon Flux Maintenance, Photosynthetic (PFMP)
  - Photon Flux Maintenance, Far-Red (PFMFR)
  - Required to have Appropriate Horticultural Lighting safety certification by OSHA NRTL or SCCrecognized body

Frequently Asked Question

Q: What specific tests are conducted as part of this program?

A: Intertek's Horticultural Lighting Certification Program will typically include:

- Safety testing, including ingress protection (IP) and others as applicable In addition, the following performance testing can be conducted:
- Photometric testing per ANSI/ASABE S642, including PAR and Spectral Distribution data

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.

Intertek has the expertise and capabilities across our global network, as well as direct involvement with industry committees and standards development, to help manufacturers meet the unique demands or horticultural lighting, gain ETL mark certification, and expand into this growing marketplace.

FOR MORE INFORMATION

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