



JOINT CANADA-UNITED STATES
NATIONAL STANDARD

ANSI/CAN/UL 8800:2023A

STANDARD FOR SAFETY

Horticultural Lighting Equipment And Systems



ANSI/UL 8800-2023



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UL Standard for Safety for Horticultural Lighting Equipment And Systems, ANSI/CAN/UL 8800

First Edition, Dated August 30, 2019

Summary of Topics

This revision of ANSI/CAN/UL 8800 dated September 14, 2023 includes the following changes in requirements:

- Typographical Correction of Photobiological Safety Markings; [19.4.2](#)***
- LED array flexing pre-condition requirement; [SA4.4.1](#)***

Text that has been changed in any manner or impacted by UL's electronic publishing system is marked with a vertical line in the margin.

The new and revised requirements are substantially in accordance with Proposal(s) on this subject dated May 5, 2023.

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AUGUST 30, 2019

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ANSI/CAN/UL 8800:2023A

Standard for Horticultural Lighting Equipment And Systems

First Edition

August 30, 2019

| This ANSI/CAN/UL Safety Standard consists of the First Edition including revisions through September 14, 2023.

| The most recent designation of ANSI/UL 8800 as an American National Standard (ANSI) occurred on September 14, 2023. ANSI approval for a standard does not include the Cover Page, Transmittal Pages, Title Page, Preface or SCC Foreword.

| This standard has been designated as a National Standard of Canada (NSC) on September 14, 2023.

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Preface

This is the First Edition of the ANSI/CAN/UL 8800, Standard for Safety Horticultural Lighting Equipment And Systems.

ULSE is accredited by the American National Standards Institute (ANSI) and the Standards Council of Canada (SCC) as a Standards Development Organization (SDO).

This Standard has been developed in compliance with the requirements of ANSI and SCC for accreditation of a Standards Development Organization.

This ANSI/CAN/UL 8800 Standard is under continuous maintenance, whereby each revision is approved in compliance with the requirements of ANSI and SCC for accreditation of a Standards Development Organization. In the event that no revisions are issued for a period of four years from the date of publication, action to revise, reaffirm, or withdraw the standard shall be initiated.

In Canada, there are two official languages, English and French. All safety warnings must be in French and English. Attention is drawn to the possibility that some Canadian authorities may require additional markings and/or installation instructions to be in both official languages.

Comments or proposals for revisions on any part of the Standard may be submitted to ULSE at any time. Proposals should be submitted via a Proposal Request in UL's Collaborative Standards Development System (CSDS) at <http://csds.ul.com>.

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This Edition of the Standard has been formally approved by the Technical Committee (TC) on Horticultural Lighting Equipment And Systems, TC 8800.

This list represents the TC 8800 membership when the final text in this standard was balloted. Since that time, changes in the membership may have occurred.

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Name	Representing	Interest Category	Region
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This Standard is intended to be used for conformity assessment.

The intended primary application of this standard is stated in its scope. It is important to note that it remains the responsibility of the user of the standard to judge its suitability for this particular application.

CETTE NORME NATIONALE DU CANADA EST DISPONIBLE EN VERSIONS FRANÇAISE ET ANGLAISE

INTRODUCTION

1 Scope

1.1 The requirements contained in this Standard apply to lighting equipment intended for use in a horticultural environment and installed in accordance with the U.S. National Electrical Code (NEC), ANSI/NFPA 70 and the Canadian Electrical Code, Part I (CEC), CSA C22.1.

1.2 Equipment covered by this Standard is intended for horticultural lighting purposes and includes: horticultural luminaires, hardware and horticultural systems intended for use in a plant growth environment.

1.3 Lighting equipment that provides broadband white light such as light for general illumination, or whose primary purpose when applied to plantings is aesthetic and/or sustaining plant life is not considered horticultural lighting.

1.4 The photobiological safety assessment within this standard evaluates the light output characteristic of a single horticultural luminaire. Applicable cautionary or warning markings are then required on the product and in the installation and operating instructions. Increased exposure risk to facility personnel may be present depending upon the number of horticultural luminaires and their placement and/or positioning within the plant growth facility.

1.5 It is the responsibility of the plant growth facility to address the risks specified in [1.4](#) at the facility level and to ensure that people entering the plant growth areas while the lights are on, are aware of these risks and that appropriate safeguards are in place.

2 Components

2.1 Except as indicated in [2.2](#), a component of a product covered by this Standard shall comply with the requirements for that component.

2.2 A component is not required to comply with a specific requirement that:

- a) Involves a feature or characteristic not required in the application of the component in the product covered by this standard, or
- b) Is superseded by a requirement in this Standard.

2.3 A component shall be used in accordance with its rating established for the intended conditions of use.

3 Units of Measurement

3.1 The values given in SI (metric) units shall be normative. Any other values shall be for information purposes only. See Annex [A](#) for metric conversion multipliers.

3.2 Temperatures are given in degrees Celsius only.

3.3 Unless indicated otherwise, all voltage and current values specified in this Standard are root-mean-square (rms).

4 Normative References

4.1 Any undated reference to a code or standard appearing in the requirements in this Standard shall be interpreted as referring to the latest edition of that code or standard.

4.2 The following standards are referenced in this Standard, portions of these referenced standards may be essential for compliance.

ASTM Standards

ASTM G 151, *Standard Practice for Exposing Nonmetallic Materials in Accelerated Test Devices that Use Laboratory Light Sources*

ASTM G 153, *Standard Practice for Operating Enclosed Carbon Arc Light Apparatus for Exposure of Nonmetallic Materials*

ASTM D 1000, *Standard Test Methods for Pressure-Sensitive Adhesive-Coated Tapes Used for Electrical and Electronic Applications*

ASTM D 5374, *Test Methods for Forced-Convection Laboratory Ovens for Evaluation of Electrical Insulation*

ASTM D 5423, *Forced-Convection Laboratory Ovens for Evaluation of Electrical Insulation*

UL Standards

UL 73, *Motor-Operated Appliances*

UL 496, *Lampholders*

UL 498, *Attachment Plugs and Receptacles*

UL 507, *Electric Fans*

UL 746B, *Polymeric Materials – Long Term Property Evaluations*

UL 746C, *Polymeric Materials – Use in Electrical Equipment Evaluations*

UL 746E, *Polymeric Materials – Industrial Laminates, Filament Wound Tubing, Vulcanized Fibre, and Materials Used In Printed Wiring Boards*

UL 817, *Cord Sets and Power-Supply Cords*

UL 962, *Household and Commercial Furnishings*

UL 1598, *Luminaires*

UL 1951, *Electric Plumbing Accessories*

UL 1977, *Component Connectors for Use in Data, Signal, Control and Power Applications*

UL 1993, *Self-Ballasted Lamps and Lamp Adapters*

UL 2108, *Low Voltage Lighting Systems*

UL 2238, *Cable Assemblies and Fittings for Industrial Control and Signal Distribution*

UL 8750, *Light Emitting Diode (LED) Equipment for Use in Lighting Products*

UL 60335-1, *Safety of Household and Similar Electrical Appliances, Part 1: General Requirements*

UL 60335-2-24, *Household and Similar Electrical Appliances – Safety – Part 2-24: Particular Requirements for Refrigerating Appliances, Ice-Cream Appliances and Ice-Makers*

CSA Group Standards

CSA C22.1, *Canadian Electrical Code, Part 1, Safety Standard for Electrical Installations*

CSA C22.2 No. 0, *General Requirements – Canadian Electrical Code, Part II*

CSA C22.2 No. 0.17, *Evaluation of Properties of Polymeric Materials*

CSA C22.2 No. 21, *Cord Sets and Power Supply Cords*

CSA C22.2 No. 42, *General Use Receptacles, Attachment Plugs and Similar Wiring Devices*

CSA C22.2 No. 43, *Lampholders*

CSA C22.2 No. 113, *Fans and Ventilators*

CSA C22.2 No. 68, *Motor Operated Appliances (Household and Commercial)*

CSA C22.2 No. 182.3, *Special Use Attachment Plugs, Receptacles, and Connectors*

CSA C22.2 No. 250.0, *Luminaires*



CSA C22.2 No. 250.2, *Lighting Systems*

CSA C22.2 No. 250.13, *Light Emitting Diode (LED) Equipment For Lighting Applications*

CSA C22.2 No. 1993, *Self-Ballasted Lamps and Lamp Adapters*

CAN/CSA C22.2 No. 60335-1, *Household and Similar Electrical Appliances – Safety – Part 1: General Requirements*

CAN/CSA C22.2 No. 60335-2-24, *Household and Similar Electrical Appliances – Safety – Part 2-24: Particular Requirements for Refrigerating Appliances, Ice-Cream Appliances and Ice-Makers*

IEC Standards

IEC 60598-1, *Luminaires – Part 1: General Requirements and Tests*

IEC 61032, *Protection of Persons and Equipment by Enclosures – Probes for Verification*

IEC 62471, *Photobiological Safety of Lamps and Lamp Systems*

IEC/TR 62471-2, *Photobiological Safety of Lamps and Lamp Systems – Part 2: Guidance on Manufacturing Requirements Relating to Non-Laser Optical Radiation Safety*

NFPA Standards

NFPA 70, *National Electrical Code (NEC)*

5 Glossary

5.1 For the purpose of this Standard, the following definitions apply.

5.2 CONFORMAL COATING – A protective covering applied on a printed wiring board to increase the dielectric voltage-withstand capability between conductors and to protect against environmental conditions. A conformal coating is not suitable as electrical insulation or as an electrical enclosure without additional evaluation.

5.3 HORTICULTURAL LUMINAIRE – A horticultural luminaire identified as such and intended to emit light at wavelengths that are intended for growing flowers, vegetables, and other plants. Horticultural luminaires may also supplement general illumination within the horticultural environment.

5.4 HORTICULTURAL SYSTEM – A prefabricated chamber, cabinet, or open frame structure of which identified for the purpose outfitted with electrical infrastructure for the active optimization of plant growth. These systems may incorporate pre-installed materials and equipment which, after installation, may be concealed and may not be accessible for inspection at the final installation site. They may additionally include lighting, shutters, controls, control panels, plumbing components (such as pump motors, solenoid valves, water reservoirs), and cooling and heating components, as part of the plant growth management control horticultural system. A horticultural system may include hydroponic, aeroponic, aquaponic and other forms of irrigation methods. Passive growing structures, such as greenhouses or tent like coverings, are not considered horticultural lighting structures in the context of this Standard.

6 Organization and Application

6.1 The standard is organized as follows:

- a) Part I – Horticultural luminaires
- b) Part II – Horticultural Systems.

PART I – HORTICULTURAL LUMINAIRES

CONSTRUCTION

7 General

7.1 A horticultural luminaire shall be capable of being installed in accordance with U.S. and Canadian Electrical Installation Codes as noted in [1.1](#), be provided with electrical insulation and enclosure(s) suitable for the intended grow environment, and safeguard against risk of shock, risk of fire, risk of personal injury, and to safeguard persons against exposure to optical radiation hazard under normal operating conditions.

8 Mechanical Construction

8.1 General requirements

8.1.1 A horticultural luminaire shall comply with the requirements in UL 1598 or CSA C22.2 No. 250.0, for "Mechanical construction," "Mounting means," "Open holes and openings," "Accessibility of supply connections," and, as applicable, the additional requirements in this section of the Standard.

8.2 UV protection of polymeric materials

8.2.1 A polymeric material such as an enclosure, barrier, baffle, or water shield exposed to the sun shall not degrade such that it no longer performs its intended function. Compliance shall be determined in accordance with either the UV Exposure Conditioning Test of UL 1598 or CSA C22.2 No. 250.0, or the Ultraviolet Light Exposure Test of UL 746C or CSA C22.2 No. 0.17.

9 Electrical Construction

9.1 General requirements

9.1.1 A horticultural luminaire shall comply with the requirements in UL 1598 or CSA C22.2 No. 250.0, for "Electrical construction," the supplementary requirements for flexible cords on luminaires, and, as applicable, the additional requirements in this section of the Standard.

9.2 UV protection of polymeric materials

9.2.1 Polymeric electrical insulating material of wiring, a component or a device, such as a conductor, cord, lampholder body, connectors body, attachment plug body, or the like, directly exposed to the sun shall not degrade such that it no longer performs its intended insulating function. Compliance shall be determined in accordance with either the UV Exposure Conditioning Test of UL 1598 or CSA C22.2 No. 250.0, or UL 746C or CSA C22.2 No. 0.17.

9.3 Supply connections

9.3.1 A horticultural luminaire having metal parts or metallized polymeric parts that are accessible during user maintenance, or component replacement without the use of tools, and that can involve the risk of shock, shall be provided with a means of connection to a single branch circuit and shall have provisions for grounding in accordance with UL 1598 or CSA C22.2 No. 250.0, using one of the following methods:

- a) Provisions for connection of conduit or other permanent wiring method as indicated in UL 1598 or CSA C22.2 No. 250.0;
- b) A length of a flexible cord;