STANDARDS UPDATE NOTICE (SUN)
ISSUED: February 23, 2018

STANDARD INFORMATION

Standard Number: UL 8750
Standard Name: Standard for Light Emitting Diode (LED) Equipment for Use in Lighting Products
Standard Edition and Issue Date: 2nd Edition Dated September 15, 2015
Date of Revision: July 27, 2017, August 17, 2017, and December 18, 2017
Date of Previous Revision of Standard: November 23, 2016

EFFECTIVE DATE OF NEW/REVISED REQUIREMENTS

Effective Date: **May 1, 2020**

IMPACT, OVERVIEW, AND ACTION REQUIRED

Impact Statement: A review of all Listing Reports is necessary to determine which products comply with new/revised requirements and which products will require re-evaluation. **NOTE:** Effective immediately, this revised standard will be exclusively used for evaluation of new products unless the Applicant requests in writing that current requirements be used along with their understanding that their listings will be withdrawn on Effective Date noted above, unless the product is found to comply with new/revised requirements.

Overview of Changes:

Changes for July 27, 2017:
- Add Supplement SF – Requirements for LED equipment with wired control circuits.

Changes for August 17, 2017:
- Add construction and performance requirements for direct plug-in units.
- Revise requirements for electrical spacing in Section 7.8
- Update construction and performance requirements for transformers in paragraph 7.9.2.
- Add acceptable results criteria for the dielectric voltage withstand test.
- Add Supplement SG – Designation of Temperature Value at the Temperature Measurement Point T_C
- Add Supplement SH – Requirements for LED Drivers with Phase-Cut Dimming

Changes for December 18, 2017
- Expand scope of standard to include LED controllers supplied from branch circuit.

Specific details of new/revised requirements are found in table below.

If the applicable requirements noted in the table are not described in your report(s), these requirements will need to be confirmed as met and added to your report(s) such as markings, instructions, test results, etc. (as required).

Client Action Required:

Information – To assist our Engineer with review of your Listing Reports, please submit technical information in response to the new/revised paragraphs noted in the attached or explain why these new/revised requirements do not apply to your product (s).

Current Listings Not Active? – Please immediately identify any current Listing Reports or products that are no longer active and should be removed from our records. We will do this at no charge as long as Intertek is notified in writing prior to the review of your reports.

STANDARD INFORMATION

CLAUSE	VERDICT	COMMENT
		Additions to existing requirements are underlined and deletions are shown ~~lined out~~ below.
		THE FOLLOWING CHANGES REFLECT THE JULY 27, 2017 UPDATE
		New Supplement Added **SUPPLEMENT SF - LED EQUIPMENT WITH WIRED CONTROL CIRCUITS**
SF1		**Scope**
SF1.1		This supplement contains requirements for LED equipment with wired control circuits.
SF2		**Definitions**
SF2.1		WIRED CONTROL CIRCUITS – Circuits integral to LED equipment that are intended to manage power, light output characteristics, transmission of operational/performance data, and the like, also identified as the control circuit in this supplement (see Figure SF2.1). Some designs may not include both of the primary and secondary circuits depicted.
SF3		**Separation of Circuits**
SF3.1		The control circuit shall be spaced or isolated from other circuits of the LED equipment as follows: a) Control circuit lead wires, terminals, and wire connectors shall comply with the requirements for Separation of Circuits, Section 7.5, b) PWB spacings between the control circuit and other circuits of the LED equipment shall comply with 7.8.2, c) Components that bridge between the control circuit and other circuits of the LED equipment shall comply with 7.9.2, and d) Isolation transformers located between the control circuit and other circuits of the LED equipment shall comply with the requirements for Coil Insulation, Section 7.11.

Exception: The requirements in SF3.1 do not apply when:

a) The control circuit does not exit the lighting equipment (i.e. the control circuit is internal to afire/electrical enclosure),

b) Risks of fire and shock concerns due to interposed circuits between different components of the lighting equipment are addressed by circuit analysis, component abnormal tests, or both,

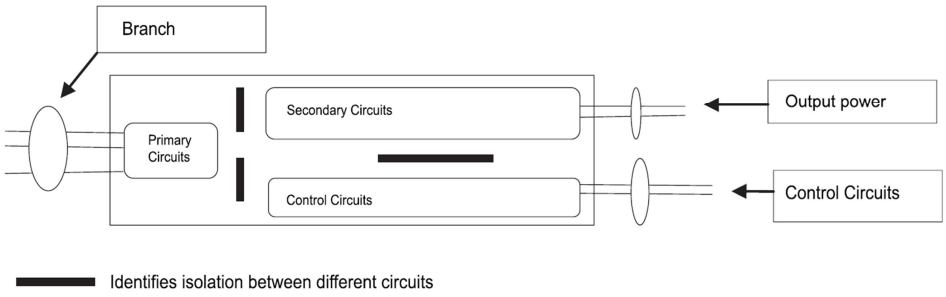
c) The required isolation for Isolated, Class 2, or LVLE power circuits is not compromised,

d) The control circuit is marked per SF8.4, and

e) The installation instructions include related information described in SF8.5.

Figure SF2.1
Wired Control Circuits

Figure SF2.1



SF4	**Control Circuit Lead Wires and Terminals**
SF4.1	Control circuit lead wires and terminals shall comply with 7.4.4.
SF4.2	Control circuit lead wires shall be a color other than white, green, or green with yellow stripe. When a control circuit lead wire is grey based on industry or proprietary control circuit protocols, the branch circuit grounded conductor (common or neutral) shall be white.
SF5	**Control Circuit Characteristics**
SF5.1	When the control circuit supplies power (to other equipment), the characteristics (V, A, W) of the power source shall be measured to confirm compliance with rated circuit characteristics as designated by the manufacturer. Additionally, if the power source is designated as Class 2, it shall comply with 7.12.
SF6	**Temperature Test**

SF6.1	In performing tests per the Temperature Test, Section 8.3, the control circuit shall be adjusted, as appropriate, for: a) Maximum input current to the LED equipment, and b) Maximum input power to the LED equipment.
SF7	**Dielectric Voltage Withstand Test**
SF7.1	Control circuits are subject to the requirements in Dielectric Voltage Withstand Test, Section 8.6, based on the required levels for isolated circuits as identified in Separation of Circuits, Section SF3.
SF8	**Marking**
SF8.1	LED equipment shall be marked to identify: a) The terminals or lead wires for control circuits, and b) The intended industry or proprietary control circuit protocols as applicable.
SF8.2	LED equipment with control circuits shall be marked Class 2 when: a) The circuit has been evaluated as a Class 2 circuit, or b) The circuit is intended for connection to an external Class 2 supply.
SF8.3	LED equipment with a control circuit that is intended for connection to an external supply (other than Class 2) shall be marked “CAUTION: More than one power supply present” or equivalent.
SF8.4	LED equipment that leverage the Exception to SF3.1 shall be marked adjacent to the terminals or lead wires: “Notice: This control circuit is not isolated – see installation instructions” or equivalent.
SF 8.5	LED equipment installation instructions shall include: a) A description of the electrical characteristics of the control circuit, b) The intended function of the control circuit, c) Details of product markings described in Markings, Section SF8, and d) The manufacturer’s recommendations for proper installation of the control circuit (e.g., acceptable system wiring configurations, considerations for load distribution, cumulative control circuits leakage currents, acceptability of the control circuit to exit the luminaire, acceptable control and sense devices that can be integrated with the control circuit, etc.).
SF8.6	Product markings specified in SF8.1, SF8.3, and SF8.4 may be included in the installation instructions if the LED equipment is intended to be integrated inside the lighting equipment.

		THE FOLLOWING CHANGES REFLECT THE AUGUST 17, 2017 UPDATE
6	Info	**Mechanical Construction**
6.1	Info	**General**
6.1.5		***New clause added;*** In addition to complying with the construction requirements specified in this standard, a direct plug-in unit shall comply with the Mechanical Assembly, Input Connections, and Accessibility of Live Parts requirements specified in the Standard for Class 2 Power Units, UL 1310.
7	Info	**Electrical Construction**
7.8	Info	**Electrical spacings**
7.8.1		Minimum spacings other than on printed wiring boards or on board-mounted components shall not be less than those shown in Table 7.4, between: a) Uninsulated live parts of opposite polarity, b) Uninsulated live parts and a grounded dead-metal part, ~~and~~ c) Uninsulated live parts and an accessible dead-metal part, and d) Circuits that are required to be electrically isolated from one another.
7.8.2		Minimum spacings on printed wiring boards and for board-mounted components shall be not less than those shown in Table 7.5 between: a) Uninsulated live parts of opposite polarity, b) Uninsulated live parts and a grounded dead-metal part, ~~and~~ c) Uninsulated live parts and an accessible dead-metal part, and d) Circuits that are required to be electrically isolated from one another.
7.9	Info	**Circuit components**
7.9.2		A component that bridges two circuits otherwise required to be isolated from one another shall be one of the following: a) A Class Y capacitor complying with the requirements specified in the Fixed Capacitors for Use in Electronic Equipment – Part 14: Sectional Specification – Fixed Capacitors for Electromagnetic Interference Suppression and Connection to the Supply Mains, UL 60384-14 (see Table 7.6), b) Two capacitors connected in series, each capacitor individually complying with the dielectric voltage withstand test of 8.6, c) An isolator complying with the requirements of the Standard for Optical

		Isolators, UL 1577, with a suitable isolation voltage rating, or d) A transformer that complies with the ~~dielectric voltage withstand test of 8.6~~ applicable construction and performance requirements in this standard.
8	Info	**Performance Tests**
8.1	Info	**General**
8.1.5		***New clause added;*** In addition to complying with the applicable performance requirements specified in this standard, a direct plug-in unit shall comply with Direct Plug-In Blade Secureness, Security of Input Contacts, and Abuse Tests as defined in the Standard for Class 2 Power Units, UL 1310.
8.6	Info	**Dielectric voltage withstand test**
8.6.3		***New clause added;*** Insulation breakdown is considered to have occurred when the current that flows as a result of the application of the test voltage, rapidly increases in an uncontrolled manner. (e.g., the insulation does not restrict the flow of the current). Corona discharge or a single momentary flashover is not regarded as insulation breakdown.
		THE FOLLOWING CHANGES REFLECT THE DECEMBER 18, 2017 UPDATE
1	Info	**Scope**
1.1.1		***New clause added;*** LED controllers covered in this standard are intended to be: a) Integral to the luminaire, or b) Located remotely from the luminaire when the LED controller is supplied from and controls the luminaire using only Class 2 circuits.
7	Info	**Electrical Construction**
7.9	Info	**Circuit components**
7.9.3		***New clause added;*** A relay shall have appropriate ratings (i.e., voltage, current, or watts) in accordance with the Standard for Industrial Control Equipment, UL 508. Additionally, a relay that operates (make or break) non-isolated circuits shall be rated based on load type as noted below: a) LED array loads are evaluated as resistive loads. b) AC transformer (magnetic) loads are evaluated as general purpose loads. Relays with this rating can also be used with LED array loads.

		c) Electronic (switch mode) transformers, LED drivers, and LED light engines are evaluated as tungsten lamp loads with endurance testing in accordance with the Standard for Industrial Control Equipment, UL 508, requirements for electronic fluorescent ballasts. Relays with this rating can also be used with LED array and AC transformer (magnetic) loads. *Exception: When a circuit is designed to trigger operation (make or break) of an electromechanical relay at the same angle of the ac sinusoidal waveform, such as at zero crossing, the relay may be evaluated based on related ratings (i.e., DC voltage, current, or watts) for the load types noted above. If the relay is triggered by an electronic circuit, this circuit shall additionally meet with one of the following requirements:* *a) Compliance with the applicable requirements of Supplement SA as a protective function, or* *b) Compliance with the Abnormal Switching Test in 8.18.*
8	Info	**Performance Tests**
8.2	Info	**Input test**
8.2.2		~~The input current (or wattage, if so rated) of a LED controller or driver shall not exceed 110 percent of the rating when operated at rated input voltage and supplying rated load.~~ For LED controllers and LED drivers: a) For constant voltage input units, the input voltage shall be set at rated value and supplying rated load. Measured input current and input power shall not exceed 110 percent of each rating respectively. b) For constant current input units, the input current shall be set at rated value and supplying rated load. Measured input voltage and input power shall not exceed 110 percent of each rating respectively.
8.18		***New section added;*** **Abnormal switching test**
8.18.1		Two test samples are prepared and connected as follows: a) The trigger circuit of the electromechanical relay is to be removed or modified to allow random switching. b) The general abnormal test procedures described in 8.7.1.1 are followed as applicable.

8.18.2		The prepared test samples shall be operated in accordance with the endurance test requirements specified in Exception No. 2 to 7.9.3 using random switching. The test samples shall be operated until either the required number of endurance test cycles is achieved or until ultimate results are demonstrated for 1 hour stabilized duration.
8.18.3		Immediately after each abnormal switching test, each control shall be subjected to the dielectric voltage withstand test of 8.6.
8.18.4		The control shall either operate as intended in accordance with the endurance test requirements, or demonstrate an end-of-life fail safe condition with no evidence of an imminent electrical shock, fire or injury to persons. There shall be: a) No opening of the ground arc detection fuse. b) No emission of the flame or molten metal, or ignition of the cheesecloth. c) No opening of the branch circuit protection device. d) No breakdown during the post-dielectric withstand testing.
9	Info	**Markings**
9.2	Info	**Identification and ratings**
9.2.2		An ~~power source integrated with a controller or LED array or both shall be provided with markings (a) through (c) below. A power source packed separately from the controller or LED array both~~ LED controller or LED driver shall be provided with markings (a) through ~~(d)~~ (g): a) Environmental suitability (dry, damp, or wet location), b) Input ~~voltage~~ supply limitations (i.e., Class 2 input only), if applicable, and, ~~c) Input current and power factor, or input wattage, and~~ ~~d) Rated output voltage and current (or wattage),~~ c) Input supply ratings: Voltage (V), Nature of supply (AC or DC; Constant Current or Constant Voltage), Frequency (if applicable), Current (A), and Power (W), d) Output ratings: Voltage (V), Nature of supply (AC or DC; Constant Current or Constant Voltage), Frequency (if applicable), Current (A). and Power (W), and e) Output load type when it is switched by the device via integral electromechanical or electronic relay (LED array, LED driver, Light engine, AC transformer or equivalent). *Exception No. 1: For built-in products, this information may be provided on a separate instruction sheet or the like.*

	Exception No. 2: When the device is marked for a specific load (i.e. by manufacturer's name and model number), items (d) and (e) are omitted. *Exception No. 3: When the device includes a light source (i.e. light engine) and has no supply output, items (d) and (e) are omitted.*
	CUSTOMERS PLEASE NOTE: This Table and column "Verdict" can be used in determining how your current or future production is or will be in compliance with new/revised requirements.