

## STANDARD INFORMATION

**If the project requires a sample for evaluation and/or testing, then this SUN applies.**

**Standard:** UL 1993 / CSA C22.2 No. 1993

**Standard ID:**

Self-Ballasted Lamps And Lamp Adapters [UL 1993:2017 Ed.5+R:26Mar2021]

Self-Ballasted Lamps And Lamp Adapters [CSA C22.2#1993:2017 Ed.3+ U1;U2;U3]

**Previous Standard ID:**

Self-Ballasted Lamps And Lamp Adapters [UL 1993:2017 Ed.5+R:06Aug2018]

Self-Ballasted Lamps And Lamp Adapters [CSA C22.2#1993:2017 Ed.3+ U1;U2]

## EFFECTIVE DATE OF NEW/REVISED REQUIREMENTS

**Effective Date:** **September 30, 2021**

## IMPACT, OVERVIEW, AND ACTION REQUIRED

**Impact Statement:** No action is required for currently certified products. If modifications to the product after the effective date require an evaluation and/or testing, then the product must undergo re-evaluation to the new requirements.

**Overview of Changes:**

- Moist ammonia air stress cracking test
- Maximum conductive length of Edison screw bases
- Evaluation of tack-soldered electrical connections
- Drop impact test determination for severely damaged lamps
- Lamps with movable joints
- Revision to Type A lamps – Revisions to HF test source
- Additional requirements for evaluating LED lamps as direct replacements for specific high intensity discharge (HID) lamps
- Temperature Test - LED Lamps
- Addition of Supplement SE - Special Use Lamps
- New Test, Construction, and Marking requirements for LED Lamps with Integral Rechargeable Batteries

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

***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 – Please immediately identify any current Listing Reports or products that are no longer active and should be removed from our records.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
		<i>Additions to existing requirements are <u>underlined</u> and deletions are shown <del>lined out</del> below.</i>
5	Info	<b>Mechanical Construction</b> <i>New section added;</i>
5.5		<b>Movable joints</b>  This section contains requirements for movable joints. See standard for details.
6	Info	<b>Electrical Construction</b>
6.1	Info	<b>Lamp bases and lampholders</b> <i>New clause added;</i>
6.1.5		The length of an Edison screw base, measured vertically from the plane of the eyelet contact (contact plate) to the plane of its furthest accessible conductive point as shown in Figure 6.1, shall not be greater than the maximum length indicated in Table 6.0B. <i>New table added;</i>

**Edison screw bases – maximum length**

	Designation	Max. Length (mm)
Table 6.0B	E39 (Mogul)	42.3
	E29 (Admedium)	29.6
	E26 (Medium)	24.8
	E17 (Intermediate)	20.8
	E12 (Candelabra)	16.9
	E11 (Mini-candelabra)	14.9

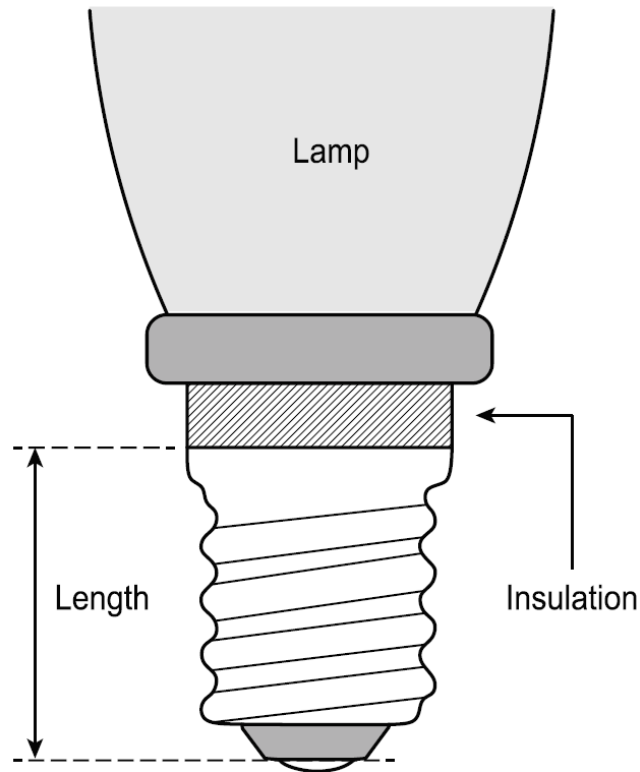


CLAUSE	VERDICT	COMMENT
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*New Figure added;*

Edison screw bases – maximum length

Figure 6.1



8	Info	<b>Tests</b>
		<i>New section added;</i>
8.10A		<b>Base insulation displacement test</b>
8.10A.1		If adhesive is used to secure the insulation, then prior to this test, the lamp shall be subjected to the pre-conditioning cycle of the adhesive support test in Clause 5.3.5.
8.10A.2		Using a 12 mm (0.472 in) diameter rod with a hemispherical end, a force of 4.45 N (1 lbf) $\pm 10\%$ shall be applied against the insulation for 5 seconds, in the manner likely to cause the most adverse displacement. Any conductive surface exposed by this force shall be considered accessible for the purposes of Clause 6.1.5, including those that are only exposed momentarily during the application of the force.
		<i>New section added;</i>
8.20		<b>Moist ammonia air stress cracking test</b>
		This section contains requirements for the moist ammonia air stress cracking test. See standard for details.



CLAUSE	VERDICT	COMMENT
		<i>New section added;</i>
		<b>Evaluation of tack-soldered electrical connections</b>
8.21		Part A – Loose connection Part B – Random contact  See standard for details.
		<i>New section added;</i>
8.22		<b>Joint endurance test</b>  One sample of a lamp with movable joints containing conductors shall be tested. See standard for details.
		<i>New section added;</i>
8.23		<b>Joint torsion test</b>  One sample of a lamp with a movable joint and a rotational stop shall be tested. See standard for details.
Supplement SA	Info	<b>SUPPLEMENTAL REQUIREMENTS FOR LIGHT-EMITTING DIODES (LED)</b>
SA5	Info	<b>Mechanical Construction</b>
SA5.4	Info	<b>Weight and moment</b>
SA5.4.2		Requirements from Clause 5.4 apply only to the lamps with the bases specified in Clause 5.4. <del>The requirements do not apply to pin based lamps.</del>
SA8	Info	<b>Tests</b>
SA8.5	Info	<b>Temperature test</b>
		<i>New clause added;</i>
SA8.5.6		Double-ended devices shall be subjected to the temperature test of Clause 8.5 while mounted within the test fixture described in Clause iSA9.5. The temperature on components shall not exceed the limits described in Table 8.2, and no wooden test fixture or lampholder surface shall exceed 90°C.
		<i>New clause added;</i>
SA8.5.7		Lamp input current shall be recorded 15 minutes after the start of the test, and at the end of the test. These values shall comply with Clause 8.2.1 and be within 10 % of each other.



CLAUSE	VERDICT	COMMENT
SA6	Info	<p><b>Electrical Construction</b></p> <p><i>New section added;</i></p>
SA6.14A		<p><b>Linear LED lamps</b></p> <p>This section contains requirements for linear LED lamps. See standard for details.</p>
SA8.8	Info	<p><b>Drop impact test</b></p> <p><i>New clause added;</i></p> <p>With regard to Clause SA8.8.2, lamp breakage is acceptable when the damage is so extensive that it is unreasonable to assume an end-user would power the device after the impact, as determined by compliance with this Clause. The test results are acceptable if:</p> <p>SA8.8.4</p> <p>a) Three samples are subjected to the Drop Impact test;</p> <p>b) At least 75% of each sample's outer surface area above its base contacts breaks away or becomes permanently separated. The surface area of interest is illustrated by the rectangular dotted box around the lamps in Figure SA8.0; and</p> <p>c) The device packaging is marked per Clause SA10.4.3.</p> <p><i>New figure added;</i></p>
Figure SA8.0		<p style="text-align: center;"><b>Outer surface area above lamp base contacts</b></p>
SA8.24		<p><b>Voltage mismatch test – linear LED lamps</b></p> <p>This test is intended to determine the effect of a voltage mismatch on linear LED lamps. See standard for details.</p>



CLAUSE	VERDICT	COMMENT
SA10	Info	<b>Device Markings</b>
SA10.2	Info	<b>Identifications and ratings</b>
		<i>New clause added;</i>
SA10.2.8		For devices substituting for linear fluorescent lamps, the device shall be marked with the appropriate type designation from SA6.13.1 in accordance with item 19 in Table SA10.1. Devices compliant with the requirements for more than one type shall be marked as such (e. g.: "TYPE A / B LAMP").
SA10.4	Info	<b>Instructions</b>
		<i>New clause added;</i>
SA10.4.3		For devices compliant with Clause SA8.8.3, the smallest unit packaging, point-of-sale package, carton, or instruction sheet packed with the device shall be marked in accordance with Item 30 in Table SA10.1.
Supplement SC	Info	<b>ADDITIONAL REQUIREMENTS FOR LED LAMPS AND FLUORESCENT LAMP ADAPTERS INTENDED AS DIRECT REPLACEMENTS FOR FLUORESCENT LAMPS</b>
SC4	Info	<b>Tests</b>
SC4.1	Info	<b>General</b>
		When a test requires the device to be energized from its intended supply source, it shall be energized from both the 60 Hz (line frequency) and high frequency reference ballasts in turn. The reference ballasts shall comply with NEMA C82.3 and be used as the supply sources for the LED lamp tests in this supplement, as follows:
SC4.1.2		a) The reference ballast shall be initially adjusted for the voltage, current, and power characteristics of the target lamp in accordance with NEMA C82.3. For double-ended fluorescent lamps, these characteristics can be found in NEMA C78.81. For single-ended lamps, these characteristics can be found in NEMA C78.901. b) With the LED lamp connected and energized from the reference ballast, the input current to the LED lamp and the voltage across the LED lamp are monitored. The reference ballast resistance is then adjusted until one of the following occurs: <u>1) The LED lamp is operating at the target lamp's rated current; or</u> <u>2) The voltage across the LED lamp equals the reference ballast input voltage value specified for the target lamp.</u> c) The high frequency reference ballast shall operate at 50 kHz.



CLAUSE	VERDICT	COMMENT
SC4.1.3		<p>As an alternative to the high frequency reference ballast described in Clause SC4.1.2, an electronic sinusoidal i50 kHz current source of sufficient current and power capacity may be used to power the LED lamp, provided that the source has the following characteristics:</p> <ul style="list-style-type: none"><li>a) Capacity to supply at least 125% of the rated input voltage of the target lamp's high frequency reference ballast;</li><li>b) Output voltage total harmonic distortion (THD) <math>\leq</math> 3% while unloaded;</li><li>c) Output frequency regulation <math>\leq</math> 2%; and</li><li>d) Output current regulation <math>\leq</math> 1%.</li></ul> <p><u>The current source shall be adjusted to either operating point specified in SC4.1.2(b)(1) or SC4.1.2(b)(2), whichever occurs first.</u></p>
Supplement SD		<p><b><i>New supplement added;</i></b></p> <p><b>ADDITIONAL REQUIREMENTS FOR LED LAMPS INTENDED AS DIRECT REPLACEMENTS FOR HIGH INTENSITY DISCHARGE (HID) LAMPS</b></p> <p>This section contains requirements for LED lamps intended as direct replacements for high intensity discharge (HID) lamps. See standard for details.</p>
Supplement SE		<p><b><i>New supplement added;</i></b></p> <p><b>SPECIAL USE LAMPS</b></p> <p>These requirements apply to self-ballasted lamps intended for tasks other than general illumination, such as horticultural or germicidal lamps. Such lamps usually emit electromagnetic energy outside the 400 – 700 nm range. See standard for details.</p>
Supplement SF		<p><b><i>New supplement added;</i></b></p> <p><b>ADDITIONAL REQUIREMENTS FOR LIGHT-EMITTING DIODE (LED) LAMPS WITH INTEGRAL SECONDARY BATTERIES</b></p> <p>This section contains requirements for light-emitting diode (LED) lamps with integral secondary batteries. See standard for details.</p>