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Vice President

May 16, 2013

VIA EMAIL TO: lamps@energystar.gov

Ms. Taylor Jantz-Sell
Environmental Protection Agency
ENERGY STAR Lighting Program Manager
1200 Penn. Ave NW 6202J
Washington, DC 20460

Lutron Comments on Draft ENERGY STAR® Program Lamp Specification v1.0 Draft 4

Dear Ms. Jantz-Sell,

Lutron Electronics Co., Inc. appreciates the opportunity to provide the attached comments on the subject proposal.

Lutron was founded in 1961 and is a manufacturer of lighting control systems and motorized window shade systems, headquartered in Coopersburg PA. Lutron has factories in Albertis PA, Allentown PA, Ashland VA, Humacao PR and four locations outside the United States.

Thank you for your consideration of these comments. We look forward to continuing to work with you further on this important project. If you have any questions on these comments, please contact me at either (610) 282 6766 or phakkarainen@lutron.com.

Sincerely,

A handwritten signature in black ink that reads "S Pekka Hakkarainen". The signature is written in a cursive style and is followed by a long horizontal line that tapers to a point on the right.

Pekka Hakkarainen
Vice President

Cc: Alex Boesenberg, NEMA
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Lutron Comments to Energy Star Lamps Specification V1.0 Draft 4

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Lutron proposes the following edits to Section 12

If lamp is designed for phase cut dimming operation (alterations to the line voltage to the lamp), select ~~40~~ 4 dimmers for testing. The ~~40~~ 4 dimmers shall meet the following conditions:

1. From at least 2 different manufacturers
2. ~~At least one dimmer~~ All dimmers must be specified as compatible for use with energy efficient lighting (such as CFL or LED lamps)
3. ~~At least one dimmer must be of one of the following types: Single (Forward) Phase Shift, Double Phase Shift, or Electronic Low Voltage/ Reverse Phase~~
4. ~~At least one dimmer must have one of the following features: Microprocessor with Power Supply, Voltage Compensation, or Pre-set levels~~

As an alternative to (1) and (2) above, the lamp may be tested against the specifications set forth in NEMA SSL 7A. In this case, testing shall be performed with one SSL 7A-compliant dimmer for the requirements in sections 12.1 through 12.4.

[Rest of section 12 unchanged.]

Rationale for edits to (2) and removal of (3) and (4):

Primary Concern: Safety

- Energy Star is a performance standard. However, safety must be considered first.
- The National Electric Code (NEC) states in section 404.14 Clause E:
“(E) Dimmer Switches. General-use dimmer switches shall be used only to control permanently installed incandescent luminaires unless listed for the control of other loads and installed accordingly.”

This requirement is in conflict with Energy Star requiring testing on dimmers designed only for incandescent loads. UL holds a similar position, as they mandate individual LED or CFL bulb testing for dimmers which claim compatibility with LED or CFL loads.

- Product ratings for incandescent dimmers were designed with the expectation they would be connected to incandescent loads. Connecting the same wattage of LED or CFL loads to a dimmer, based strictly on the incandescent rating (for example, 600W), will exceed the dimmer’s design and temperature limits.
- Therefore, dimmer manufacturers cannot endorse or support using their products in applications that violate their design or certifications.

Secondary Concern: Practicality

- All major dimmer manufacturers now have dimmers specially designed for LED and CFL loads. In many cases, these new products are replacing the incandescent-only dimmers, making it more difficult to acquire dimmers that represent the installed base
- Categories such as “single/double phase shift,” “voltage compensation,” and “pre-set” are only known by the technical people in the lighting control industry. While these terms define some generic dimmer architectures, no dimmer manufacturers label or market their products with these terms, and some products may even blur the line between multiple categories. Generally speaking, knowledge of which dimmer model number falls in which category is only known by the engineers that designed the product.
- Finally, performance can vary extremely widely depending on which dimmer is used for the testing. It is poor practice to test a device (LED/CFL lamp) against an unknown quantity (randomly-selected dimmer) and expect any sort of reproducible results. Testing has shown that the dimmer being selected, as well as the number of loads being used, will have a very strong impact on the dimming range that is achievable on any particular lamp. Different dimmers give different voltages at high end and low end, creating requirements for the lamp that conflict with one another (for example, a lamp may need to reach low end light level on one dimmer at 20V, and another dimmer at 35V). A better test procedure should define a given dimmer output voltage and a corresponding light level expected from the lamp.

Rationale for addition:

- NEMA SSL 7A specifies a “synthetic waveform generator” that produces repeatable phase-cut dimming angles, which should not vary based on the amount or type of lamps attached. This removes the variability associated with using other randomly-selected dimmers, and focuses on the lamp design and characteristics alone.
- The test procedures within SSL 7A take into account the factors which cause excessive heating of dimmer components, ensuring that the design limits are not exceeded.
- Since SSL 7A test procedures are well defined, testing of multiple dimmers for compatibility is not required. Therefore, the burden on lamp manufacturers to test multiple dimmers for flicker and audible noise is drastically reduced.