



May 17th, 2013

Taylor Jantz-Sell
US Environmental Protection Agency
1200 Pennsylvania Avenue, NW
Washington, DC 20460

Subject: ENERGY STAR® Lamps v1.0 Specification Draft 4

Dear Ms. Jantz-Sell,

Cree has reviewed the ENERGY STAR® *Lamps v1.0 Specification Draft 4* received via email on April 19th, 2013. We recognize the importance of the EPA and industries efforts to develop and release a technology neutral ENERGY STAR specification for LAMPS in an effort to promote energy efficiency within the lighting industry for one of the most recognized product categories in the ENERGY STAR portfolio. Cree respectfully submits the following comments and request that each be carefully considered prior to finalizing the specification for release.

Please note that Cree will also be submitting additional comments/detail that is proprietary and will be considered as "DO NOT POST".

Thank you in advance for your consideration. Please feel free contact me at 919.407.4077 with any further questions that you may have.

Sincerely,

A handwritten signature in black ink, appearing to read "J. Vollers", with a stylized flourish at the end.

Jonathan Vollers
Product Qualification Program Manager

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GENERAL

Technology Neutral Specification: In previous webinars and ENERGY STAR® partner meetings, it has been stressed that the goal of the program requirements for lighting were that they be technology neutral and that they would not favor a particular technology or manufacturer. In the spirit of creating an even playing field and providing the end consumer a high quality product which represents the ENERGY STAR brand, Cree strongly recommends that the requirements in a number of areas be reviewed / modified in an effort to ensure consistency for all technologies. These areas will be highlighted by our comments for various sections.

SECTION 1 – SPECIFICATION SCOPE & LAMP CLASSIFICATION

Non-Standard Form Factor (Page 1): If it is indeed the intent of the EPA to remove the Non-Standard form factor from SSL then to be technology neutral, that should also apply to CFL products as well. There is no reason to demand SSL product to fit within conventional form factors and allow CFL technology to maintain the non-standard form. This drives cost into the SSL technology and therefore reduces the speed of adoption. This is counter-intuitive with the goals of ENERGY STAR.

SECTION 2 - EFFECTIVE DATE

Effective Date (Page 2): Cree would like to understand the expected testing that would be required to take an INTEGRATED LED LAMPS v1.4 product and qualify it under the new LAMPS v1.0. Specifically, does rapid cycle need to be repeated (as well as other testing, like lifetime, etc...) due to the increased time “on” and time “off” in Section 10.3. Please provide a list of testing that can be excluded to re-qualify a product previously qualified to the CFL or LED specification. All manufacturers need to understand the burden of testing they will need to endure to re-qualify a product to LAMPS v1.0.

SECTION 7 - PRODUCT CERTIFICATION

Product Variations (Page 7): The lack of allowable variations drives multiple series of tests on variations which are not required per LUMINAIRES v1.2 (due to sound technical arguments). This seems to drive inconsistency (and cost increase towards lamps) across ENERGY STAR testing for products that in many ways are similar.

CCT being the largest variation, for most manufacturers, this seems to be overkill by running lifetime, and rapid cycle, etc... on all color temperatures when historically the warmest temperature would be the worst performer and therefore representative of the entire CCT variations. Even if IIL v1.4 and CFL v4.3 have had these procedures in place, we believe that the EPA should look to lessen the testing



burden where there is a good technical argument to augment the increase due to the new sections/testing introduced.

SECTION 9 - PHOTOMETRIC PERFORMANCE

CCT (Page 14): Even though it states that the passing number of units is 9 out 10 in the requirement, the Passing Test criteria for Solid-State still shows all units must fall within the 7-Step ANSI quadrangle. Please update to reflect the requirement update for clarity.

Color Rendering (Page 15): The R9 value is an area where there should strive for technology equality. The argument during the EPA webinar is that CFLs cannot meet the $R9 > 0$ without cost and technology improvements which would be too much burden for manufactures as the lighting industry transitions to Solid-State products. There is a cost burden for the SSL as well, so Cree proposes that instead of removing R9 requirement for CFLs, establish a value that the technology can support but still provides a value to the consumer. Establish a minimum criteria of $Ra \geq 80$ & $R9 > -5$ which would be relatively imperceptible and would allow SSL products to reduce the cost associated with maintaining the $R9 > 0$ but make it a level playing field for both technologies.

Cree will provide supplemental information regarding distribution of CRI and R9 to help illustrate the effect on SSL products and therefore the cost associated.

SECTION 10 - LUMEN MAINTENANCE AND RATED LIFE

Lumen Maintenance and Rated Life (Page 18): Cree recommends clarifying the supplemental testing guidance, for Section 10.1, regarding the products that can be tested at 25°C and what products need to be tested at elevated temperature. See the following for an example update:

The following shall be tested be tested in accordance with the ENERGY STAR Ambient Temperature Life Test in an ambient temperature condition 25°C ±5°C:

- *All decorative lamps, omnidirectional lamps < 10 watts*
- *All omnidirectional lamps labeled “not for use in enclosed fixtures” on the lamp and lamp packaging*
- *All lamps labeled “not for use in recessed fixtures” on the lamp and lamp packaging*

Cree also believes to be consistent with ILL v1.4 and with the wattage requirements of omnidirectional and decorative lamps that direction lamps, that are <10W, also be allowed to be tested at 25°C rather than the elevated temperature. This would allow for use of existing test data as we transition from one specification to the other as well as provide some consistency of application across lamp products.

In addition, the labeling of lamps for restricted use and low wattage exceptions may allow products to be placed in enclosed fixtures or misused by the consumer. A possible protection, to ensure customer long-term satisfaction and perception of SSL product, a thermal shut down circuit could be required to



be installed in these lamps. This may be a way to help offset any concern for these restricted products being a safety concern or public relations issue.

Section 10.3 Rapid Cycle update of time “on” and time “off” has driven this test to be much longer taking up valuable space for other products to be tested. It also nullifies testing done to ILL v1.4 which would be a huge burden for products to be re-tested to meet LAMPS v1.0. If the timing cannot be changed can current testing be used in a modified manor to reduce the burden of re-test.

SECTION 11 - ELECTRICAL PERFORMANCE REQUIREMENTS

Power Factor Requirements (Page 21): The revised specification indicates that for residential applications that CFLs must only meet a power factor of 0.5 or greater. Cree would recommend increasing the power factor requirement to 0.7 to be consistent with solid state lighting. CFL manufacturers have the technology available and can design these products so that they meet the power factor put in place for LED technology. While there would certainly be a cost associated with meeting this increased requirement, this cost burden should not only have to be made by solid state lighting manufacturers.

SECTION 12 - DIMMING PERFORMANCE: ALL LAMPS MARKETED AS DIMMABLE

Number of dimmers requested in this DRAFT 4 is excessive and would cause a large testing burden to be placed on manufacturers. Cree believes that having 2-4 dimmers tested, with the current variation requirements, would be more than sufficient to support the ENERGY STAR need. Anything beyond that amount would most likely result in very similar product being tested (color variations, etc...) which will not provide statistically significant information since the product would be tested multiple times without any really changes in the dimmer function or performance.

Maximum Light Output (Page 23): “rated” should be changed to “measured” in the following requirement: “Lamp light output on a dimmer/control shall not exceed the lamp’s *rated* light output by more than 10% or fall below the maximum light output by more than 20%”. The reasoning is that one would not want the tolerance to be a part of the variation so measuring the unit under test (UUT) and then applying this requirement is appropriate.

Flicker (Page 24): Cree recommends adjusting the high end of the Flicker Index range would be better suited at 400Hz rather than 800Hz as our experience and data suggests that our perception of flicker is well below 400Hz. This would limit testing burden to products where flicker may be perceptible to the human eye and therefore value added.

Cree will provide supplemental information regarding flicker in support of this discussion.



Audible Noise (Page 24): Cree recommends defining the number of dimmers tested to be limited due to the burden of testing this at an accredited lab. Therefore, we recommend testing the “worst-case” of the dimmers selected for overall dimming testing and run the unit at full power and at fully dimmed. This should provide a representative audible noise test without creating a multiplication effect by all the various dimmer requirements.

SECTION 14 – DIMENSIONAL REQUIREMENTS

Lamp Shape Dimensions (Page 26): All materials and products that are manufactured have variations, and bulbs that are dealing with new technology should be afforded the greatest margin for these variations. Cree recommends adding a manufacturing tolerance to the ANSI dimensions applied (Min OAL, MOL and MOD) of 1% to allow for tolerance distribution over time. This would help prevent any issues from the initial submitted design to ENERGY STAR qualified products that are audited.

SECTION 15 - LAMP LABELING, PACKAGING & WARRANTY REQUIREMENTS

Lamp Labeling (Page 26): Cree would recommend that the EPA provide allowances for products where labeling space may not necessarily be available. There are going to be certain design constraints that need to be carefully considered. For example, there is a very limited amount of space available on MR-16 style lamps and will become exceedingly difficult to find room to include this information along with all of the regulatory labeling that is required as well. A second example would be an omnidirectional style bulb in which the only available space to place the product information requested would impact the light output and distribution.

Cree recommends that alternatives for space limited product be allowed, such as a peel off label that will be removed prior to use or another temporary system that provides the information but it is not part of the product permanently.

Lamp Packaging (Page 26): For MR style lamps the specification is requiring that a significant amount of information be captured on the exterior of the packaging. The packaging for these style lamps is already very small and including this information along with all of the required regulatory markings and product information will likely not be achieved. Cree would request that the EPA reconsider moving forward with these requirements of provide acceptable alternatives to products with dimensional limitations.