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Cree Comments - T20 45 Day language

Additional submitted attachment is included below.

Mr. Andrew McAllister
Commissioner
Docket Unit
California Energy Commission
Docket No. 15-AAER-06
1516 Ninth Street, MS-4
Sacramento, CA 95814-5512

December 7, 2015

Cree Comments on Small Diameter Directional LED Lamps and General Purpose LED Lamps – Express Terms 45 Day Language

Dear Commissioner McAllister

Cree welcomes the opportunity to participate in the rulemaking process with the CEC, and to provide the attached comments on the Proposed Title 20 recommendations for Small Diameter Directional Lamps and General Purpose LED Lamps.

Cree (Nasdaq: CREE), headquartered in Durham, N.C., is the leading U.S.-based developer and manufacturer of LEDs and LED Lighting products. Cree is leading the widespread adoption of LED lighting making energy-wasting traditional lighting technologies obsolete through the use of energy-efficient, mercury-free LED lighting. Cree is a leading innovator of lighting-class LEDs, LED lighting and semiconductor products for power and radio-frequency (RF) applications.

Cree has been granted over 4,000 US and Foreign patents, and is focused on developing and providing innovative technologies and products to save energy and to provide consumers with a better lighting experience. While LED lighting can easily provide energy savings through more efficient lamps and fixtures, just as important is the need to provide customers with a satisfactory user experience. Cree believes everyone deserves better light, and supports the efforts in California to ensure products sold in the state meet customers' expectations.

Our detailed comments follow, and we welcome the opportunity to contribute to this important effort.

Regards,



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Following are Cree's comments and recommendations on the Express Terms 45 Day Language for Small Diameter Directional LED Lamps and General Purpose LED Lamps. We address the following items:

1. Section 1605.3 State Standards for Non-Federally-Regulated Appliances, (k), C (ii), (iii)
2. Section 1605.3 State Standards for Non-Federally-Regulated Appliances, (k), C (vi)
3. Section 1607 Marking of Lamps, (B)

Item 1) Section 1605.3 State Standards for Non-Federally-Regulated Appliances, (k), C (ii), (iii)

The proposed language in **Section C (ii) and (iii)** requires a minimum CRI (Ra) of 82 and individual color scores for R1-R8 a minimum of 72.

Comments: Cree supports the requirements for high-quality color, as the widespread replacement of incandescent and halogen lamps will require meeting customers' expectations for light quality. Providing GSL and decorative lamps meeting these light quality requirements is reasonable by January, 2017, although these requirements will likely result in lamps that are up to 20% more expensive than other high-quality lamps that fall just short of these measures (especially R8). California will need to provide sufficient utility rebate program funding to offset this increased cost.

Item 2) Section 1605.3 State Standards for Non-Federally-Regulated Appliances, (k), C (vi)

The proposed language in **Section C (vi)** for Omnidirectional light distribution requires lamps to meet the requirements of ENERGY STAR's Product Specification for Lamps Version 1.1.

Cree's Recommendation is to align the California Title 20 requirements with the Omnidirectional light distribution requirements of the proposed ENERGY STAR Product Specification for Lamps Version 2.0.

Comments: Cree supports the commission's efforts to ensure California citizens are provided with high-quality LED lamps that meet their performance expectations while also delivering significant energy savings. The proposed standards for GSL and decorative lamps are reasonable in most respects and for the most part do not present overly burdensome requirements except where they are markedly misaligned with the requirements set by the U.S. EPA for ENERGY STAR. Particularly problematic is the divergence between Title 20 and ENERGY STAR's proposed v2.0 requirements for omnidirectionality. While color quality and efficacy can benefit from expected incremental improvements in LED component performance with changes usually limited to the electronic circuitry, light distribution performance requires optical and mechanical capabilities that are fundamentally different between the two proposed standards. Meeting the two different standards would likely require a unique mechanical / optical design for each, effectively doubling the investment in tooling and greatly increasing design, manufacturing and distribution costs. Cree proposes that California align the light distribution/omnidirectionality requirements of Title 20 with those of ENERGY STAR v2.0 to allow manufactures to deliver an affordable range of lamps to the California market.

The omnidirectionality requirements proposed by EPA for ENERGY STAR v2.0 are good and will provide consumers with acceptable light performance. The differences between the v1.1 and v2.0 specs drive fundamental design and cost considerations that will necessitate different designs and products for the two markets. This is not acceptable to Cree, and it is unlikely that Cree would create and support two fundamentally different design platforms.

Item 2) Section 1607 Marking of Lamps, (B)

The proposed language in (B) requires LED lamps to meet all of the stated requirements before including comparisons to incandescent lamps, including wattage equivalencies. The requirements include a CCT of 3000K or less.

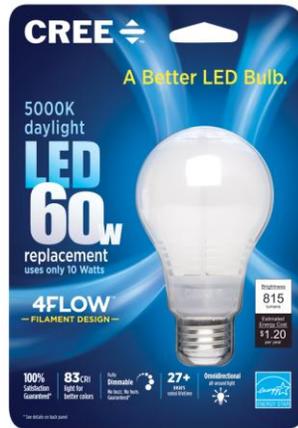
Cree's Recommendation is to permit wattage or light output equivalency claims for higher CCT lamps to simplify the shopping and purchasing decisions for the consumer.

Comments: Without the ability to state a wattage comparison for Daylight (5000K) bulb, consumers will be forced to know what lumen output represents the bulb they're seeking. For example, they need to know 800 lumens to replace a 60W incandescent and 1600 lumens to replace a 100W incandescent.

Below are examples of our packaging for 2700K soft white and 5000K daylight bulbs. We indicate the color both through text and color treatment to help guide shoppers, in addition to the Lighting Facts label prominently displayed on the package.



2700K Warm White



5000K Cool White

Summary

Assuming the Title 20 omnidirectional light requirements are aligned with the proposed ENERGY STAR 2.0 requirements, Cree believes that providing GSL and decorative lamp products that meet the proposed standards as of January 1, 2017 is quite possible. However, in some cases, these products will be priced at least 20% higher than otherwise high-quality products that fall slightly shy of the proposed standards. Once again, contingent on the assumption that Title 20 omnidirectional light requirements are aligned with the proposed ENERGY STAR 2.0 requirements, Cree is confident that technology developments can lead to compliant lamps at relative price parity later in 2017. If California is prepared to compensate for the price delta with sufficient utility rebate programs, then California consumers can begin to enjoy the benefits of products meeting the proposed specification after January, 2017. Otherwise, we propose that the effective date be delayed until later in 2017 or early 2018.

