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**From:** Brian Halliwell [mailto:BHALLIWELL@lightsofamerica.com]  
**Sent:** Wednesday, June 17, 2009 6:43 PM  
**To:** richard.karney@ee.doe.gov  
**Cc:** SSL; Mohammed Razzak  
**Subject:** ENERGY STAR criteria for integral LED lamps - Comments on Draft #2

Dear Richard,

Lights of America (LOA) has evaluated the Energy Star Program Requirements for Integral LED Lamps Draft 2 - May 19, 2009. Since 1978, LOA has been a fluorescent CFL and fixture manufacturer located in Walnut, CA. Since 2006, LOA has been developing different applications for LED technologies including but not limited to LED commercial signs, Desk/Floor Lamps, Outdoor fixtures and task lights. In 2008, LOA began shipping 5MM LED integral replacement lamps. These lamps, marketed primarily as accent lights, included B, G, R, Par and MR-16 lamp configurations providing accent lighting for decor, spot, track and flood light applications. Although the lamps provided an energy efficient-long life-mercury free alternative to low lumen output incandescent and CFL alternatives, the applications were limited by the total lux that could be created thru the use of 5mm LED's.

LOA intends on complimenting the existing 5mm integral LED replacement lamp product line with a full range of Power LED integral replacement lamps. Several of these new Power LED lamps will begin shipping to national retail chains in Sept of 2009. LOA's design focus with this new product line is centered around meeting all Energy Star Program Requirements for Integral LED lamps once finalized. It is also LOA's intention to become and remain a valued stakeholder within the Energy Star SSL program throughout the programs duration.

As LOA has been an active and impactful manufacturer on the direction and development of the CFL bulb and fixture retail markets since 1978, LOA now is focused on accomplishing the same type of market development within the retail market place with LED integral replacement lamps and luminaries. For 30 years, our company has focused on integral design and manufacturing of products with constant product evolution to provide a functional product the consumer desires at an affordable price. Product evolution of products that are affordable for the majority of the American public requires providing product performance features that are acceptable to the public while improving the performance annually without increasing the product cost. Part of this product evolution is based on identifying the availability of raw materials and solid state components that are available from many suppliers to provide the performance features for which a market exist or can be developed. The ability to use raw material and solid state components that would not be considered exclusive to one or a few suppliers as this both increases the cost substantially for these components and limits the ability to modify and/or change product designs in the future to improve the end products performance from year to year.

With this said, there are a few concerns we have relative to the Energy Star criteria for integral LED lamps Draft #2.

**Color Rendering Index (CRI) - Minimum of 80 Request**  
**for consideration: Minimum of 70**

Reason:

There are many chip and packaging companies within the LED manufacturing sector. Specific CRI requirements, just as beam angles, dictates the resulting lumen efficiency and overall lumen output when cost is a consideration. Although there are many different LED chip/array/modules

available to accomplish any specific lighting objective, the cost structures vary widely when taking into account these two (2) fundamental specifications. Of the many different LED manufacturers capable of providing LED configured solutions only 15% of these manufacturers offer today cost effective configuration providing 80 or greater CRI with efficiencies greater than 70 lumens/watt at 3000K. 3000K will be the primary CCT promoted in the market place for residential lighting in the retail market place, although 4100K and 6500K are also being requested by retailers. These few LED manufacturers happen to be the largest of the chip manufacturers having the largest R&D budgets resulting in the most advanced performance of chips available today. A CRI of 80 would be considered an advanced performance specification taking into account cost impacts as the standard performance in the industry at 70 lumens/wt at 3000K CCT would provide 72-75 CRI. The substantially higher chip cost to increase the CRI from 72 to 80 also limited substantially both the different LED configured solutions and # of LED manufacturers to few.

Lights of America is requesting consideration that the CRI specification be 70 for the 1st year of the Energy Star LED integral replacement lamp specification. This will enable greater market competition generating both accelerated product performance advancements and reduced product cost on the shelf. The 80 CRI with required efficiency factors at affordable cost will be achievable by the vast majority of LED suppliers by 9/10. This would not preclude LED replacement lamp suppliers from marketing a higher CRI LED replacement lamp as a part of a marketing strategy.

**Dimming - Dimmable or non-dimmable acceptable Comment**  
**for consideration: Create a Super LED specification for dimmable LED integral replacement lamps**

Reason:

Whereas the the LED chip/array/module has the largest impact on overall performance and cost of the LED integral replacement lamp, the driver technology utilized is derived from a different set of parameters not the least of which includes a different component market. With this said, there is dimming technology available today at an affordable cost for the LED integral replacement lamps. As the emphasis on the specifications and discussions at the round tables and conferences tends to center around not going thru the same evolution pattern as the CFL and providing features not available in most CFL's, LED integral replacement lamps should offer as many desirable consumer features possible that CFL's do not if the feature can be obtained without restraint of trade by limiting competition. As the driver can be compared to a CFL ballast relative to its basic function and no single solid state component determines the drivers performance including damnability, the dimming function within the driver should either be required within the specification or established as a separate specification that can be targeted and acknowledged by the specification as being beneficial. Many utilities have emphasized their desire to only provide incentives for LED replacement lamps that are dimmable. Establishing this requirement as a requirement or a separate specification that is acknowledged by Energy Star will provide these entities a means of quickly including LED replacement lamps into their energy efficient programs.

**Luminous intensity distribution - Even distribution of lumens within 0 to 135 degrees**  
**Request for consideration: Change range to 0 to 120 degrees**

Reason:

Using the same justification referenced within the CRI request for consideration, the majority LED chip/array/module manufacturers provide a 120 degree beam angle inherent to the chip. Thus, the

requirement for even distribution of luminous intensity beyond 120 degrees will require the use of only a few manufacturers chips/arrays/modules or a secondary optical lens to ensure the even distribution of luminous intensity beyond 120 degrees limiting both the benefits of competition and creating unnecessary cost additions to the product.

We appreciate the opportunity to respond and look forward to working with Energy Star to earn the right to be considered a valued stakeholder in this important program.

Please contact me at (951) 205-1524 should you have any questions.

Thank you

Best Regards,

Brian Halliwell  
Vice President Sales and Marketing

Lights of America  
611 Reyes Drive  
Walnut, CA 91789  
(800) 321-8100 ext. 1209  
(909) 598-6732 (fax)