
From: Bill Blackley [mailto:bblackley@nexxuslighting.com]
Sent: Friday, June 26, 2009 11:58 AM
To: richard.karney@ee.doe.gov; SSL
Cc: Mike Bauer; Justin Larson; Terry Flint; Jeff Aymond; Roy Archer; Bill Blackley
Subject: FW: Energy Star Integral LED Lamps
Importance: High

Dear Sirs;

While we are in agreement with the majority of the content laid out in Draft 2 of the Energy Star Program Requirements for Integral LED Lamps, we have two concerns regarding CRI and Power Factor correction.

We note that the Energy Star Standard for Solid State Luminaires specifically calls for a minimum CRI of 75 for indoor luminaires. Because of this Nexxus Lighting holds the view that the CRI standard for Integral Lamps be lowered from 80 to 75. Significant reasoning is laid out below:

1. As SSL lamps are developed, three general design concepts are kept in mind: Energy Efficiency, Color Quality, and Product Reliability/Longevity. The proposed standard certainly concerns itself with all three, but the focus here is Lumen loss vs. CRI. More specifically, in many cases, designers of SSL lamps are forced to make a compromise between Luminous Efficacy and CRI. At the LED level, Flux losses can be as much as 10%-25% only raising the CRI by 5%-10%. In other words, lighting manufacturers should have some design freedom in which they're able to produce a much more energy efficient lamp, while still maintaining a CRI of 75. Disqualification of an extremely energy efficient lamp (where the general belief is that energy efficiency should be the primary objective for a standard that is defined by the DOE and EPA), seems to be counterintuitive.
2. As per the [CIE Technical Report 177:2007: Colour Rendering of White LED Light Sources](#), there is a acknowledged problem using the CRI described in CIE 13.3-1995 when used in conjunction with White LEDs. More specifically from this document, "*The conclusion of the Technical Committee is that the CIE CRI is generally not applicable to predict the colour rendering rank order of a set of light sources when white LED light sources are involved in this set.*" The Report goes on to say that the development of a new Index, or set of indices, should be used in the future in order to more accurately describe light sources using LEDs.

While the development of this new method of characterizing white LEDs is a long-term process, some considerable thought should be placed on how much importance CRI should have on this particular energy-minded document. Best stated from an article released from the DOE itself (**see attached document**)

"CRI can be considered as one data point in evaluating white LED products and systems. It should not be used to make product selections in the absence of in-person and on-site evaluations." Furthermore, it states, "*If color appearance is more important than color fidelity, do not exclude white light LEDs solely on the basis of relatively low CRI values. Some LED products with CRIs as low as 25 still produce visually pleasing white light.*"

Given that the CIE and the DOE have come to these conclusions under considerable experimentation and study, and the viewpoint that Energy Efficiency at this point should be more important than CRI, Nexxus Lighting is requesting that the Minimum CRI for an integral lamp be lowered to 75 in an effort to include high quality light sources.

In addition;

If the goal of Energy Star is to "Save money and protect the environment through energy efficient products and practices" We have a concern that the suggested minimum power factor is listed as 0.7. Lighting products account for roughly 30% of the total electrical power consumed in the United States consequently we ask ourselves does it make sense to have such low performance requirements on such a significant fraction of the total electrical load?

Standard incandescent lamps have a very high Power factor (at or close to 1.0), therefore using replacement lamps with 0.7 would negatively affect Energy Star's vision of certifying energy efficient products and practices. Today technologies are readily available for cost effective power factor correction at the lamp level and since a high power factor is desirable to reduce transmission losses and improve voltage regulation at the load, Nexus Lighting believes the power factor specification must be revisited and treated with the utmost importance.

Bill Blackley LC, CSI, IESNA
Vice President
Nexus Commercial Lighting Inc
124 Floyd Smith Drive Ste 300
Charlotte, NC 28262

Phone: 614-214-5889
e-mail: bblackley@nexuslighting.com