



Alex Baker  
Energy Star Lighting Program Manager  
United States Environmental Protection Agency  
Washington, DC 20460

June 17, 2010

Dear Mr. Baker,

LEDdynamics has reviewed the new proposed Energy Star® Program Requirements for Luminaires Version 1.0 Draft 1 as published by the EPA. The following commentary reflects our concerns and recommendations based on our experience as a manufacturer of solid state lighting fixtures and components.

### **Color Temperature - CCT**

The EPA's and DOE's opinion that consumers prefer warmer colors is contrary to our experience and the viewpoint of our clients. The sales data for our under-cabinet fixture reveals that the 5000K CCT model has the highest demand accounting for 88% of shipments to date. Another linear product we manufacture has the greatest demand for models with CCTs in the range of 4000K to 5000K. These products are sold in both the commercial and the residential markets.

We are concerned that restricting CCT options would create a notion that there is a lack of interest by manufacturers to qualify SSL products. In reviewing the past issues of the RLF and SSL specifications, we are confused by the logic employed to restrict certain marketable products by limiting consumer choice. Perhaps the EPA's note on RLF v4.3 Draft specifications page X illustrates the cause and effect of such restrictive model in discussing the grandfathering rules, only to apply additional restrictions to solid state lighting in the draft document.

"Note: ... To date, no LED based fixtures have met v4.2 performance requirements, therefore there is no currently qualified LED based fixtures ..."

The Energy Star program for luminaires could be improved by preventing such a scenario through specifications that allow for expanded consumer choice. We recommend that the specification's CCT options to include all ANSI spec CCTs.

### **Power Factor Requirements**

The proposed specification should account for the availability of power adapters with high power factors and low power output. The draft spec power factor correction requirements for SSL products prevents the use of an external power supply (EPS) for any application under 100 watts.

The Energy Star qualified EPS list includes many power supplies with high power factors meeting our specific needs under 40 watts. Unfortunately, the listed products we identified exist only as prototypes or only available via special overseas orders with minimum quantities targeted for high volume power supply distribution channels.

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The luminaire specifications should accommodate for the inclusion of any Energy Star qualified EPS following the same standards found in the Energy Star EPS specifications where power factor correction is required above 100 watts. The luminaire specification should also make an exception to testing requirements of EPS units used to power a SSL product where the EPS is already Energy Star qualified and tested to product safety standards such as UL or ETL.

Aside from EPS units, the power factor requirement is a concern for manufacturers as the June 8<sup>th</sup> webinar audience voiced many comments on this issue. Perhaps PFC for solid state lighting in general should be reconsidered as it could create the same qualification scenario described above in the CCT comments or simply make SSL products not affordable. We recommend that the power factor requirements be set at  $\geq 0.5$  for solid state lighting for both commercial and residential applications whose power consumption is under 100 watts until the technology can be better evaluated for low power fixtures.

## **Energy Efficiency**

We question as to the efficiency of power factor correction for low power luminaires in general. Have studies been done to show that efficiency is not compromised by PFC in low power systems? A quick search on the this subject shows that loss in efficiency is less of a concern above 75 watts, just not conclusive to units below that threshold.

Restricting the CCT options to warmer colors for LED products could reduce the combined efficacy for all Energy Star qualified LED luminaires on the national level. This seems to be counter intuitive to the our nation's efforts in reducing the total energy consumption and perhaps could further damage the Energy Star brand where both quality and energy efficiency are the primary guiding principles.

## **Inseparable Luminaires**

The development of solid state lighting fixtures to meet efficiency, quality, and acceptable pricing requires design options that may include integrated components. This does not mean the product is wasteful or contains undesirable attributes. Such products can be made recyclable fitting into the June 8 webinar call to reduce, reuse, and recycle. LEDdynamics has an established recycling program for its inseparable luminaire products. The high efficacy penalty for inseparable luminaires establishes a roadblock for products developed to meet an acceptable market price. The proposed requirement will not necessarily reduce waste and could include other undesirable side effects.

The production of luminaires with replaceable light engines would require additional design elements for proper thermal management, product serviceability, and electrical connections. These elements would increase the total number of parts for a product, increasing manufacturing waste, and directly impacting the price for SSL products. Improper thermal coupling design in compact space could contribute to higher failure rates. Failure rates for product that are serviceable by the consumer or a qualified electrician could increase should the product not be designed to accommodate the lack of experience with solid state lighting during module replacement.

Inseparable luminaires include positive attributes that make such products simpler, reduce the number of failure points, improve reliability, and deliver a product at a price point that is acceptable to the consumer. The proposed high efficacy requirements designed to block inseparables may be counter productive to the desired outcome of the Energy Star program. We recommend that the provisions be removed from the specifications to allow for a better market driven policy.

## **Limits On Lifetime Claims**

How will Energy Star qualified SSL products with lifetime claim restrictions stack up to competing products that are not part of the Energy Star program? Would the consumer view a non-qualified longer-lifetime rated product as better quality and designed to last longer compared to an Energy Star qualified product? Will it make them think that the product will experience catastrophic failure at 25,000 hours similar in event to the common light bulb? Will the consumer associate the Energy Star brand with low-life products?

Perhaps it would be better to ban all product lifetime statements and require only the product warranty for all Energy Star qualified products regardless of technology. Another option could be a simple statement next to any lifetime claims indicating that the number derived is based on manufacturer's estimate and not endorsed by Energy Star. Perhaps the specifications should simply enable the 6x rule based on the manufacturer's documented actual lifetime test results and not LM-80's 6000 hour time frame. A marketing study by Energy Star to evaluate consumer perception on product lifetimes claims and their understanding of SSL products could be used to better construct the lifetime specifications.

## **Tolerances**

While the specifications are derived from the DOE's current SSL specs, it does not include tolerances for CCTs, zonal distribution, and other specific requirements. We presume that these will be added back in perhaps in the next specification draft release.

## **Summary**

LEDdynamics applauds the efforts made to combine the EPA's and DOE's specification into a single technology-neutral luminaire program. We think this is a step forward for the Energy Star program. The new direction gives manufacturers the confidence needed to invest in the qualification process. LEDdynamics looks forward to engaging our products in the qualification process once a clear and stable road map has been established.

We appreciate the opportunity to comment on the first draft of the new luminaire specifications. Please don't hesitate to contact us with any questions.

Sincerely,  
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