



MATERIALS DEPARTMENT
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U.S. Environmental Protection Agency
Energy Star Program
Ms. Taylor Jantz-Sell
Lighting Program Manager, Energy Star
1200 Penn Avenue NW 6202J
Washington, D.C/ 20160

Re: Comments on ENERGY STAR Program Requirements Product Specification for Lamps
(Light Bulbs), Version 1.0, DRAFT 3

Ms. Jantz-Sell:

With the emergence of Solid State Lighting technology, quality of light is taking on a new significance. Previous technologies like CFLs have failed to achieve their potential adoption rate largely because of low light quality, even though they are significantly more energy efficient than incandescent light sources. Therefore, better quality of light from LED light sources is absolutely crucial to the rapid market adoption of this technology.

The U.S. Environmental Protection Agency (EPA) correctly points out in their new lamp specification that color quality is a potential barrier to broader consumer adoption of energy efficient lighting. Given the critical importance of this issue, I strongly recommend that EPA address quality of light, specifically higher Color Rendering Index (CRI), in the new lamp specification.

Fundamental physics research shows that there is a ~2% penalty in luminous efficacy per point of CRI. So, going from a CRI of 80, where most LEDs operate, to a CRI of 90, there is a ~20% penalty in lm/W. To address this penalty and provide consumers the option for higher CRI ENERGY STAR qualified LED lamps, I suggest that EPA add to the 9.1. Luminous Efficacy: All Lamps table a column for Minimum Lamp Efficacy (initial lm/W) for lamps with a CRI of ≥ 90 . The new column should have an across the board 20% reduction in lm/W for each lamp type.



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Thank you in advance for your time and attention to this very important matter.

Sincerely,

A handwritten signature in cursive script, appearing to read "Shuji Nakamura".

Shuji Nakamura, Ph.D.
Professor of Materials Department
Co director for the Solid State Lighting & Energy Center
University of California, Santa Barbara