

Email Received on October 21, 2008 from Craig Wright

Alex,

Sorry for the late reply. Time got the better of me. Please consider the following comments if it's not too late. I'd be glad to discuss any item further as required to convey intent.

#### CCT

My only real concern is on the QA side. Commercial engines typically have several small emitters which allows them to blend and generate fairly decent consistency. Residential engines typically have only a few emitters. Prior to the ANSI bins, Progress focused on a single bin in each color rank to maintain consistency; however, this was not always as effective as required. It remains to be seen if the tighter ANSI bins are going to be sufficient, or if sub-bins are going to be required. So, you may find that products will qualify, but maintenance may be another matter. Agreed that CCT's should be limited to the proposed temperatures. Allowance of engines with cooler CCT's could be considered as long as they are corrected at the luminaire level.

#### Light Output

The DOE definition of efficacy is going to create issues in the market place as consumers will be faced with comparing luminaire and system based efficacies. The end result will be that LED products are inferior to CFL. Basing LED lumen output against conventional sources is not a good benchmark. Take for example a pendant with both LED and CFL or incandescent sources. The latter bulbous sources scatter light in the 90-270 zone which is nice for general illumination, but not typically needed in residential applications (aesthetics first). The LED pendant on the other hand is directional, so our design challenge is to illuminate the decorative glass sufficiently to convey aesthetic intent. As far as the task/functional aspect of the pendant, the directional nature of LED's will produce most of the lumens in the downward direction, so you may end up with more footcandles on the workplane as opposed to the traditional bulbous sources. So, just because the total flux of the LED luminaire is less than that of a traditional source doesn't mean that it isn't as effective both aesthetically and functionally. If it is desired to establish flux minimums, please take into account the various losses associated with different luminaire types (e.g. recessed is typically 50%).

#### Efficacy

The DOE definition of efficacy is going to create issues in the market place as consumers will be faced with comparing luminaire and system based efficacies. The end result will be that LED products may/will be perceived as being inferior to CFL. At a minimum, we need to figure out a way to convey performance criteria in such a way as to allow easy comparison with other sources. It is recommended that some thought be put into evaluating the efficacy levels established in RLF 4.2 keeping in mind the directional nature of LED's. The label proposed by NGLIA may be a good starting point for discussion, but it too divulges

efficacy in terms of the luminaire which perpetuates market confusion in comparison to other sources.

#### Testing Approach

The system based testing approach is most relevant to decorative luminaires where aesthetic appeal is the primary design intent. Take pendants as an example which have many different shade shapes, textures, and colors/finishes. A blue shade (darker, less transmissive) will produce about 1/2 the lumens in comparison to the same shade in white for example. So, based on luminaire efficacy, the engine would have to be designed to accommodate the worst case shade to ensure minimum light levels are achieved; however, this may very well mean that the more transmissive white shade produces too much light. The selection of the shade is a customer choice, and it is up to the manufacturer to ensure that the customer is aware of the performance trade-offs associated with aesthetic appeal/desire. Likewise, designs for the same general pendant may differ significantly, so a luminaire based comparison would become nearly meaningless to the consumer. A system based approach to efficacy will inform the consumer of the base performance of the product line, and will allow them to compare performance between manufacturers. All of this so as not to take away from the unique potential of LED's in industrial design in efforts to convey and maintain aesthetic appeal. Leave it to the manufacturers to produce the performance data required for the customer to make a rational decision on which manufacturer's product they believe produces the desired aesthetic effect and performance.

#### Light Pollution/Trespass

Isn't this adequately covered by Dark Sky already? Don't perpetuate yet another situation where we have two standards for the same criterion.