

September 15, 2008

NGLIA & NEMA Comments on DOE Proposals to Expand Category A of the Energy Star Solid State Lighting Luminaire Program

Thank you for the opportunity to provide the following comments on the proposed expansion of Category A applications under the Energy Star Solid State Lighting Luminaire program on behalf of the **Next Generation Lighting Industry Alliance (NGLIA)** and the **Solid State Lighting Section and Luminaire Section of the National Electrical Manufacturers Association (NEMA)**. NEMA is the secretariat for the NGLIA, designated in 2005 as the “industry partner” by the U.S. Department of Energy (DOE) for its Solid State Lighting (SSL) program.

In general, we encourage DOE to take a very close look at its proposals and the following comments submitted by industry and to determine whether it is feasible for Energy Star to be moving forward so aggressively – with a proposed effective date of December 15 – to label luminaires in these applications. As discussed below, we see quite a few issues that need to be resolved before an expansion of Category A should move forward. We strongly support DOE’s work in this area and look forward to providing assistance as these outstanding issues are addressed – to the benefit of the industry, the Energy Star SSL program, and the discerning SSL consumer.

On another general level, we noted that a couple of the proposed applications (parking garage and wall wash) specify the shape of the fixture as “circular or square.” Are these specific shapes included simply to describe the shape of fixtures now available in the market or to make clear that other, non-specified shapes are excluded? For example, does DOE intend to exclude “rectangular” parking garage luminaires from Category A, and, if so, for what reasons? Some clarification is needed here. We would support deletion of the fixture shape from the description.

Moreover, in several cases the application baskets seem poorly defined and a product could be described in multiple categories. Would DOE allow a product to be qualified in more than one category? We suggest additional description of each category would help to eliminate ambiguity.

Energy Star qualified products should promote energy efficiency, minimum maintained efficacy and good lighting practices. However, much of what constitutes good practice in the field is driven by proper application of the available solutions. Energy Star should ensure that specifications are not mandating product characteristics that arbitrarily constrain solutions based on one perspective of good practice that is not applicable in all situations.

Before we provide the comments and suggestions to each proposed SSL applications on the proposed list of Category A additions, we would like to present some concerns raised from the LED manufacturers.

1. Chromaticity requirement for outdoor lighting applications

The lighting industry is unaware of any evidence that supports restricting CCT to 7000K or less for outdoor lighting applications. The LED technologies often lead to higher energy efficiency and productivity in the higher CCT range. SSL Energy Star manufacturing partners do not believe that high CCT sources are unacceptable for outdoor lighting applications nor do they believe that higher CCT would adversely affect overall acceptance of SSL outdoor luminaires. We would appreciate DOE provision of any information, studies, data, or other tangible evidence regarding CCT limitations for these applications that has been the basis of DOE's proposal to limit the CCT.

The SSL Energy Star manufacturing partners will cooperate with the DOE to establish reasonable limiting values and to develop guidelines and standards commensurate with the evidence. In the absence of such evidence, the industry cannot support "concerns about higher CCT" as an appropriate basis.

Manufacturing partners are also concerned about this issue as it would negatively impact the growth of the SSL market where collectively they have invested heavily in the success of these products. Our concern is that an arbitrary CCT cutoff will be without real benefit and could negatively impact the goal of significant market penetration of SSL. The industry firmly believes that product performance requirements must be the result of vetted and validated technical or market data.

2. IESNA LM-80 and LED lumen maintenance compliance with Energy Star

The U.S. lighting industry has been diligently working to finalize the IESNA standard for testing LED lumen maintenance. In the latest balloting version of LM-80, 3 different case temperatures and minimum of 6000 hours (250 days) testing are specified. The Energy Star qualification procedure requires that the LED manufacturers submit the LM-80 specified data in order to comply. We are afraid to report that almost all major LED manufacturers currently, or by September 30 – the effective date for SSL Energy Star — will not possess such data to comply with the LM-80 specification.

Also, on an on-going basis LED manufacturers are developing and bringing new products to the market; requiring 250 days of testing data to be submitted prior to qualification may cause significant market delays. We recommend DOE consider a contingency procedure for the lumen maintenance data requirements. The industry is willing to work with DOE to develop a practical and reliable contingency procedure.

Surface and pendant mounted downlights

Regarding the acceptable CCTs, only residential applications are referenced. Does this mean that qualified luminaires intended for use in commercial environments have untethered CCTs?

Moreover, we believe that CCT should not be limited to 2700, 3000 and 3500K. A CCT of 4100K is also important in this application, especially in the case of linear fluorescent fixture replacement by pendant downlights.

Given the known linkage between CCT and luminaire efficacy, we are also concerned about the single minimum efficacy rating and the range of CCTs. Also, has DOE considered a CRI metric for this application?

The reference requirements for downlights relative to light in the 0-60 degree zone and luminaire efficacy can be problematic because there are valid reasons why someone may choose to use a certain reflector finish, or an optical system that distributes light at higher angles in order to achieve good distribution or contrast.

If DOE is attempting to address “glare” with the 0-60 degree requirement, this has the potential to be a real problem with SSL luminaires. It will drive the market to design products that focus all the light downward and will create poor uniformity that also impacts visibility. At this time, it is unclear whether the threshold of 75% of lumens in this 0-60 degree zone is appropriate.

Moreover, when the document refers to bilateral symmetry, it could appear to be referring to a wall wash unit. Virtually all downlights are symmetric except those used for accent lighting or wall wash.

Outdoor pole/arm-mounted area and roadway luminaires

We believe strongly that the zonal lumen density requirements should be re-evaluated very closely in the context of recent work by the IESNA and the International Dark-Sky Association (IDA) on a Model Lighting Ordinance (MLO), which does not require all luminaires to have 100% downlight. While the MLO has not been released yet, it does allow some uplight based on the lighting zone in which a product will be installed.

While some major luminaire manufacturers have been working up to now on the premise that a nighttime friendly outdoor product needed to provide 100% downlight, this practice is changing to match the guidance in the MLO.

Regarding the beam uniformity metrics, we see significant issues on several levels. The Zonal Luminous Intensity analysis is not currently available using existing software packages, thus imposing a multi-step and burdensome process on luminaire manufacturers. DOE should also reevaluate the assumed 4:1 pole height to spacing ratio, as this is not a standard throughout the industry and various applications deviate from it.

The thresholds for maximum intensity reference IESNA TM-15, however the zones described do not relate at all to TM-15. In addition, TM-15 relates to zonal lumens – not max intensity. How were these thresholds derived? The industry is moving away from prescribing a fixture’s intensity profiles as good/bad and moving toward letting the application and solution options drive the judgement of how well any photometric distribution performs in a given application.

The beam uniformity metric limits solutions and fails to recognize that roadway luminaires often serve as sidewalk illumination in residential and light commercial areas.

Why does the specification set thresholds and then allow a variance of +/- 5%?

What is the justification for the luminaire efficacy threshold? It is assumed this refers to initial light output. However, minimum maintained system efficacy is what really matters. DOE should consider this issue for this applications and the following section on outdoor decorative luminaires.

Outdoor pole/arm-mounted decorative luminaires

See comments in preceding section on luminaire efficacy.

Regarding the minimum light output requirement, this presupposes that an application does not exist for fewer lumens that would be included in this classification.

Outdoor wall-mounted area luminaires (“wall packs”)

See comments in preceding sections on minimum light output.

Cove lighting - asymmetric distribution

As noted above, this category is not well defined and could cause confusion as to its coverage. Most linear cove lighting is not asymmetric. Moreover, the bullet points included before the technical requirements specifically exclude luminaires to accent a cove or provide “mood” lighting. In this case, we recommend changing the title of the category to “Indirect lighting – asymmetric distribution”. The category could also cover track lighting, but it is not clear whether this is covered only under the proposed category “Surface-mounted luminaires with directional head(s)”.

The lumens/ft criteria seems stringent with respect to lower light levels and color flexibility.

We also suggest changing the Minimum Luminaire Efficacy for this category from 561 m/W to 501 m/W since 56lm/W is too high for the warmer temperatures.

Circular or square parking garage luminaires

The one-size-fits-all zonal lumen density requirement is inconsistent with varying applications in this area. As with other applications above, stating distribution limits where these are not needed

unnecessarily constrains the solution provider from optimizing against the application conditions to the limits of LED technology.

In addition, the luminous efficacy requirement is inconsistent when compared to the outdoor pole/arm-mounted area luminaire and the zonal lumen density approach does not address the energy savings possible in this application. DOE should reevaluate these metrics.

Bollards

The luminaire efficacy for this application is significantly lower than for other outdoor applications included in this specification. This is one instance where the efficiency requirement could be higher and is artificially low because it is tied to the existing technology rather than considering an optimized LED approach. Also see comments above on zonal lumen distribution requirements.

Circular or square wall wash luminaires

We do not understand the requirement for 50% of light to be in the 20-40 degree zone. Typically a wall wash unit must distribute light at a much higher angle to actually light the wall. At 20-40 degrees, you are lighting the floor. The asymmetrical profile requirement limits the geometrical and physical configuration for this application. The CCT specification is also very limiting. DOE should consider matching to C78 specification.

Ceiling-mounted luminaires with diffusers

We are confused that if DOE is attempting to address glare with other categories, why would they not want address it here? This could be the most detrimental to visual performance in an office environment.

DOE should consider dropping the cosine distribution requirement and expand the range of acceptable CCTs to include 4100K.

Surface-mounted luminaires with directional head(s)

See comments under Cove lighting, above. Additional definition of the category is needed.

Additional category proposed: linear direct lighting

We suggest addition of a new category for linear direct lighting. This new category is analogous to linear fluorescent products that typically are cable or pendant mounted from the ceiling and are mounted individually or in a row. They are similar to the indirect or cove lighting products except that these are inverted and are pointed straight down to illuminate a task/space. Our suggested technical specifications are:

Minimum Light Output	400 lumens per ft
Zonal Lumen Density Requirement	Luminaire shall deliver a minimum of 75% of total lumens within the 0-70% zone.
Minimum Luminaire Efficacy	35 lumens/W
Allowable CCTs	2700K, 3000K, 3500K, 4000K, 4500K, 5000K

Thank you for your serious consideration and attention to these comments. We look forward to continuing work with the DOE team to make the Energy Star Solid State Lighting Luminaire Program a great success.

Contact Craig Updyke at 703 841 3294 or cra_updyke@nema.org with any questions.

END COMMENTS