Non-White/Amber Light FAQ

Background

The DLC recently introduced its LUNA Version 1.0 Technical Requirements, a policy that offers a streamlined path for identifying and selecting LED products that meet the efficacy thresholds necessary for inclusion on the DLC's Solid-State Lighting (SSL) Qualified Products List while also limiting sky glow and light trespass and helping to mitigate light pollution. A subset of the DLC's SSL Version 5.1 Technical Requirements, LUNA V1.0 applies only to white-light LED outdoor products with correlated color temperature (CCT) between 2200K and 3000K. **LUNA does not include non-white light (NWL) - such as "amber" - LED luminaires that can reduce light pollution and are deemed appropriate by some standards for sea turtle nesting sites and other environmentally-sensitive wildlife areas.**

During development and implementation of LUNA V1.0, stakeholders asked the DLC to consider allowing NWL LED sources, such as phosphor-converted (pc-) Amber and direct emission (de-) Amber products to be eligible for LUNA qualification. To evaluate this consideration, the DLC conducted a research project and recently completed a whitepaper that provides an overview of the state of the science and current recommendations for NWL LED sources in outdoor lighting applications, as well as why the DLC is not addressing NWL LED luminaires in LUNA at this time.

FAQ

What are the benefits of NWL?

While outdoor LED lighting offers higher efficacy, better optical and dimming control and other benefits over incumbent technologies such as High-Pressure Sodium (HPS) and Low-Pressure Sodium (LPS) fixtures, it has been linked to several adverse environmental impacts, such as disruption in the circadian systems of animals and plants and disorientation of sea turtles, migrating birds and other wildlife. Since "amber" sources can eliminate short wavelength radiation linked to these impacts, "amber" products have emerged as a potential strategy to limit light pollution and other negative effects of artificial light at night (ALAN).

Why is the DLC not currently including NWL in LUNA?

Authors of the DLC whitepaper found several significant gaps in research, standards and guidelines regarding NWL/"amber" LED products that must be addressed before the DLC can consider adding these products to the LUNA program. These issues include:

- Lack of standardization in metrics and measures used to describe the capabilities and features of NWL products. Lighting requirements published by various institutions, ranging from public advocacy groups to governmental regulators, share little agreement on NWL spectral thresholds and metrics. Likewise, there is wide variation and lack of standardization in lighting and LED chip terminology. Multiple actors and advocates appear to be working independent of one another to define limits that meet their particular needs.
- Regarding efficacy performance, the research showed that very few pc-Amber roadway/area products and no de-Amber products could meet the DLC's SSL threshold efficacy requirements.
- Several research tasks remain to underpin relevant technical requirements, including evaluation of more de-Amber and pc-Amber LED products regarding susceptibility of lumen output and lumen color maintenance to temperature fluctuations; and evaluation and development of appropriate luminaire efficacy, chromaticity, color rendition, and color maintenance thresholds for pc-Amber and pc-LEDs (an emerging third category of "amber" products that has better color rendition but produces slightly more relative sky glow).

What does the DLC regard as next steps toward including NWL in LUNA?

Since the DLC utilizes standards to ensure that LED luminaires qualified under our technical requirements can be reliably and consistently measured and evaluated worldwide, existing lighting standards must be updated to include NWL sources so that the DLC and other stakeholders can evaluate these products using an objective, consistent framework.

Necessary developments include:

- Standardized chromaticity boundaries for NWL products, including "amber," "red-orange," "red," etc.;
- Standardized terminology and naming conventions;
- Standardized nomenclature that encompasses the totality of optical radiation to which plants, animals, birds and insects are sensitive (as these are all different);
- Guidance on color rendition thresholds for NWL sources;
- Standardized reporting requirements for light source spectral power distribution; and
- Standardized calculation procedures for computing astronomical sky glow and other negative impacts of ALAN.

Please visit our LUNA webpage for more information about LUNA V 1.0 and the DLC's efforts to address potential negative impacts of ALAN.