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| Certification | Recertification of Currently Certified Products | Will products need to be recertified with V2.0, how much will recertification cost, and how much time will be allowed for recertification? | <p>While any major version revision e.g. going from a v1.2 to V2.0 means products need to be recertified to the newest version, it does not necessarily mean they need to be retested. Based on the current proposals for Luminaires version 2.0, EPA does not anticipate any retesting will be necessary for currently certified products that already meet the proposed requirements. Recertification is likely to be a very simple administrative exercise particularly when it is obvious the product type meets the new requirements. EPA will provide guidance for certification bodies and partners to help simplify recertification based on the final specification and its impact to currently certified products. Specific questions on certification costs should be directed to EPA recognized Certification Bodies.</p> <p>The general timeline for ENERGY STAR specification revisions is for the specification to become effective nine months from final release.</p> |
| Certification | Directional Luminaires | A stakeholder suggested that EPA add the pathway for directional luminaires to utilize ENERGY STAR Lamps for certification information. | The agency has evaluated the appropriateness of directional lamp certification data for purposes of directional luminaire certification, and found that there would be little benefit to partners by including this pathway. Very limited data would be usable from the lamps, as directional luminaires require luminaire photometry. Additionally, integrated or purposefully designed solutions are likely to be more effective and efficient for the targeted light distributions required of directional luminaires. |

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| Allowable Variations | Displayed Performance | A stakeholder raised concern over the allowable variations for wattage as potentially confusing to consumers and efficiency programs, noting that the data from one wattage may not be representative of wattage variations. | The primary shared data for wattage allowable variations is the intensity distribution and the color angular uniformity compliance. Each wattage variant of the model would still have its own power consumption data and photometric performance data from an integrating sphere scan. These variations will be reported as separate line items on product listings to avoid confusion. |
| Allowable Variations | Guidance | A partner suggested allowing more interpretation in the allowable variations for additional flexibility. | While the agency understands the desire for additional flexibility, in a third party certification system it is very important that all partners and certifying bodies are operating under the same guidelines. Additionally, EPA has received feedback on the original Luminaires V1.1 specification that the existing guidance was not clear enough to prevent different interpretations among certification bodies. To ensure all products are treated equally EPA has taken steps to make the product family testing requirements more clear so they can be implemented consistently throughout the program. |
| Test Methods and Reference Documents | TM-21-11 Addendum | Will the Addendum A that was recently published by the IES be incorporated into the Luminaires V2.0 Specification? | The Agency has incorporated Addendum A into one of the TM-21 Calculators. EPA also recognizes that there are LEDs that have significant LM-80 data from existing testing that is not consistent with the requirements in Addendum A and has an alternate calculator available. EPA also understands that the IES is working on adjustments to the Addendum, and will monitor the IES work throughout the specification process. |
| Test Methods and Reference Documents | ANSI/UL 1598C | With the addition of additional SSL retrofits, EPA should include ANSI/UL 1598C as a reference document. | ANSI/UL 1598C is now in the reference documents of the specification. |
| Testing | Color Tunable Luminaires | A partner requested clarification on the intention for the testing points, if the target was the center point of the ANSI | The test point or setting that should be used to verify that the luminaire meets the performance requirements, should |

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| | | bin, or a specified tolerance around the ANSI CCT center point. | be a point within the allowable ANSI CCT ranges (ellipse or quadrangle) associated with the least efficacious mode. The manufacturer selects the test point and shall provide detailed instructions for how to achieve the least efficacious setting. |
| Testing | In-Situ Temperature Testing | Several stakeholders expressed concern over not ensuring a heat test is performed for the luminaires using the certification pathway outlined in section 8 and suggested that ENERGY STAR lamps be tested consistent with the requirements of LED Light Engines, and subject to IES LM-82-12 and an in-situ test to confirm the operating temperature of the lamp inside the designated luminaire. | EPA introduced shipping with ENERGY STAR lamps as a streamlined pathway in luminaires because the testing required for ENERGY STAR lamp certification is robust and strenuous. The ENERGY STAR Lamps testing includes long term testing of lumen and color maintenance and many lamps are also required to undergo long term high heat testing. While EPA understands that heat has an impact on photometric performance of ENERGY STAR lamps and LED light engines, the agency is confident that the requirements set forth by the ENERGY STAR Specification for Lamps V1.1 addresses these issues for the vast majority of non-directional luminaires. To provide additional assurance of performance for bulbs used in the fixture type of most concern for heat buildup, EPA has proposed additional guidance and an in-situ temperature test of lamps used in enclosed luminaires, along with a clear definition of an enclosed fixture adapted from UL 1598. |
| Testing | In-Situ Temperature Testing | A stakeholder requested additional guidance for testing of (downlight) retrofit kits to ensure consistency of testing and performance reporting. | The agency has provided additional guidance regarding the testing of recessed downlight retrofit kits to better represent the thermal situations that the retrofits will be used in, and improve consistency in testing and reporting. |
| Testing | Sample Size | EPA received support from several stakeholders on the reduction in testing sample sizes. | EPA maintains the reduced sample sizes from Draft 1. |

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| Efficacy | SSL Retrofit Kits | Several stakeholders suggested that 70 lumens per watt would be too challenging for SSL retrofits trying to comply with California voluntary and pending mandatory specifications looking for 90+Cri and 50+ R9 values. | While EPA does not have R9 data for ENERGY STAR luminaires as it has not been required, EPA's analysis showed that products with 90+ CRI can indeed deliver 70 lumens per watt. |
| Efficacy | LED Light Engines | <p>Several stakeholders suggested that proposals in draft one for differing source efficacy requirements for LED light engines without optics and retrofit kits with and without optics added unnecessary complication to the specification. They suggested that all light sources measured at the source should be held to the same efficacy levels.</p> <p>A partner commented that the program should not treat SSL retrofits and LED light engines differently for efficacy requirements, as they are very similar in concept and construction.</p> | <p>EPA proposed efficacy levels that maximize the energy savings for end users, while allowing manufacturers additional flexibility to use the light source in the most effective and efficient way possible based on the design of the luminaire. Proposed efficacy levels were set to reflect the inherent difference in source efficiencies if a LED source has integrated optical controls or does not, as some luminaires require the use of a light engine with secondary optics, and other luminaires have additional light controls built in and do not need secondary optics on a light engine. Similarly, the levels set for retrofit kits account for the application specific design where the retrofit is optimized for the specific luminaire type versus a multi-purpose LED light engine.</p> <p>In Draft 2 EPA has proposed aligning the efficacy requirements of SSL retrofits with LED light engines, recognizing the similarity in the products.</p> |
| Efficacy | | An efficiency organization suggested that some of the levels do not appear aggressive enough, with over 50% of currently certified luminaires able to meet the requirement, rather than the goal of 25%. The organization also | The goal of the ENERGY STAR program is to set requirements that reflect the performance of top performing products in the market (not just among the efficient technologies) without sacrifice in performance and so that any added cost is paid back in a reasonable time. . The proposed efficacy levels |

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| | | <p>encouraged annual percentage increases in efficacy levels.</p> <p>A manufacturer also suggested a 10% annual tier increase in efficacy would be reasonable.</p> | <p>represent a significant increase over incandescent and halogen products. EPA believes they provide fair, competitive levels for the anticipated effective date in 2016 that will also allow for differentiation and enough selection in the market of ENERGY STAR fixtures at various price points.</p> <p>EPA has proposed a longer term increase for luminaires two years after the effective date, informed by DOE's R&D work detailed in the specification.</p> |
| Efficacy | Directional | <p>A stakeholder suggested raising the efficacy of Under Cabinet lights from 29LPW to 50LPW and Accent lights from 35LPW to 50LPW. In order to meet consumer demands for "smooth light" (to avoid reflections of "LED Dots" in their granite counter tops, etc.) and very low profile in Under Cabinet fixtures, manufacturers must use frosted diffusers and different quantities, spacing and types of LED which can lower efficacy by 15% to 20%.</p> | <p>EPA has adjusted the efficacy levels for under cabinet and accent lights to better account for losses in optics based on stakeholder feedback.</p> |
| Scope | Proposed removal of Luminaires Shipping Without a Lamp | <p>Stakeholders had mixed reactions to the proposed removal of luminaires that do not ship with light sources, with utilities generally in favor of the change, and a two manufacturers disagreeing. The manufacturers argued that the ENERGY STAR logo would still help consumers select efficient linear fluorescent products that were unaware of the U.S. Department of Energy requirements.</p> | <p>Any linear fluorescent light and fixture combination offered for sale today is required to meet minimum federal levels that already exceed ENERGY STAR levels. Because the federal level is set to the point of maximum feasible tech, there is nowhere for ENERGY STAR to go beyond it.</p> |

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| Scope | Removal of Lamp Base Restrictions for Screw Based Luminaires/Certification with ENERGY STAR certified lamps | <p>Many stakeholders were supportive of the proposed change to allow screw based luminaires for the additional flexibility it will allow manufacturers, and for the simplification of the certification process. A handful of manufacturers expressed concerns over changing their marketing strategy.</p> <p>Some stakeholders suggested EPA require additional labeling to differentiate fixtures that ship with screw based lamps from other ENERGY STAR fixtures. One suggested luminaire photometry also be performed for some SSL products so that the performance is measured and displayed consistently no matter what light source solution is being employed.</p> <p>A partner raised concern that consumers may not know the appropriate type of lamp to replace in their luminaire when the time comes, and suggested additional labeling on enclosed fixtures</p> | <p>EPA has received largely supportive feedback on the additional pathway, and the opportunity that this will provide to simplify certification and expand consumer choice of efficient products.</p> <p>While the changes may require shifting of some partners' marketing strategies, with the rate of technological change in the lighting industry, this is not anticipated to add more complexity but rather new marketing opportunities.</p> <p>It is not clear that EPA adding new packaging/marketing requirements to distinguish between integrated solutions and screw based solutions is essential to ensuring a positive consumer experience with these products. Manufacturers may choose to make these marketing choices if they see a benefit to doing so.</p> <p>EPA plans on providing information in the qualified product list to help identify luminaires utilizing different types of light source solutions, (e.g. E26 screw base bulbs, custom connected LED light engine, various Zhaga books, etc).</p> |
| Scope | Security Lights | A partner expressed concern over the upright requirement change in moving security lights to directional luminaires, noting that many of these products utilize adjustable heads. | Security lights with adjustable heads can be measured with the heads adjusted to any position, but the position would have to be noted for repeatability in verification testing. |
| Outdoor Lighting | Non-Directional Pathway | Several stakeholders commented that while the intent to limit upright on outdoor luminaires was well placed, the | EPA understands that there are many priorities that a consumer has when selecting lighting, and one of those priorities is the appearance of the fixture. EPA |

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| | | consumer preference for outdoor lighting includes many types of lighting, including those that have uplight and are more non-directional in nature. | also recognizes that porch lights have different uses, some of them are used outdoors in the open where the uplight requirements may be applicable, while others are used outdoors but are under a ceiling where the uplight requirements may be unnecessary. As such, EPA proposes to return to dual pathways for porch lights, directional and non-directional to allow flexibility and consumer choice |
| Certified Lighting Subcomponent Database | Additional Sources & base types | A partner requested that additional base types be allowed in the specification, beyond what is currently covered in the ENERGY STAR Lamps specification. Specifically, miniature bases such as G4, G9, and GY6.35 were mentioned, and suggested these lamps be included in the certified lighting subcomponent database. | Certification of luminaires with ENERGY STAR certified lamps is expected to reduce confusion associated with the testing and certification of integral lamps with ANSI bases by removing the need for integral lamps to be on the CSD. While EPA recognizes that there are replacement lamps with form factors not covered in the Lamps specification, many of these products are unable to meet the replacement levels of the incumbent technology today. Additionally some are low voltage products which would not be covered by the lamps specification. EPA may consider adding integral lamp types for the lamps specification if appropriate. |
| Certified Lighting Subcomponent Database | Clarification on use | A stakeholder requested that the CSD be integrated into the specification since it is a valuable tool in the certification process. | EPA has integrated the CSD into the Test criteria section 5 of the Luminaires V2.0 Draft 2 to explain how the database may be used to support luminaire certification and provide a clear link to the tool. |
| Zonal Lumen Density | Undercabinet | A recognized certification body expressed concern over the clarity of the asymmetrical requirement, and requested clarification of the requirement to ensure all products are evaluated the same way. | EPA has included clarifications in the supplemental testing guidance to assist certification bodies in their evaluation of asymmetrical distributions for cove and undercabinet lighting. |

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| Zonal Lumen Density | General | One manufacturing partner suggested that there should be no zonal lumen density requirements, and the program should expect luminaire manufacturers to market products that will have the widest appeal. Efficiency organizations support maintaining zonal lumen density requirements. | In alignment with ENERGY STAR principles to identify energy saving products without sacrifice in performance, EPA is maintaining zonal lumen density requirements and remains open to adding additional distribution types for existing categories upon suggestion. |
| Color Requirements | Correlated Color Temperature | Several stakeholders proposed including additional color temperatures, lower (warmer) than 2700K. The inquiries ranged from 2000K to 2500K, seeking to simulate dimmed or “retro” style lamps. | The Agency is aware that IES is in the process of updating ANSI C78.376-2001 and C78.377-2011 to include CCT bins for 2200K and 2500K. EPA is willing to consider the inclusion of these additional CCT bins if stakeholders can demonstrate consumer demand and quantify the potential energy savings opportunity. Stakeholders are encouraged to provide feedback on whether to allow these additional CCT bins. In addition, descriptor terms for these colors are needed to properly and consistently communicate light color to the end user. |
| Color Requirements | R9 Red Rendering | Some stakeholders expressed concerns with the R9 equal or greater than 0. The concern is that fluorescent products would require redesign, and the change would reduce the efficiency of the products. | The agency maintains the requirement, to hold fluorescent and solid state products to the same requirements. |
| Color Requirements | Color Angular Uniformity | Stakeholders supported changes to color angular uniformity requirements to remove the effects of uncertainty when measuring very low intensities, but suggested additional clarifications. | EPA clarified the language to say that only the area of interest noted in the zonal lumen density is subject to the color angular uniformity requirements. |
| Requirements | Start Time | Stakeholders had mixed reactions to the proposed increase in stringency for start time. Several partners expressed | The vast majority of currently certified products meet the 500 millisecond level, for both the ENERGY STAR |

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| | | concern that the reduction in start time to 500 milliseconds would have an impact on CFL products, but efficiency organizations supported the change. A laboratory noted that the connected products could have difficulty meeting the start time requirement in the specification, and suggested maintaining the one second requirement. | Luminaires and the ENERGY STAR Lamps specifications. EPA intends for start time to be measured the same way regardless of whether the luminaire is remotely controlled. All luminaires are intended to be tested for start time with power cycling, rather than alternate means such as via a remote. |
| Requirements | Run Up Time | A partner noted that there was not a specified temperature in the requirement for run up time, noting that ambient temperature has an influence on the run up time of fluorescent products. | EPA acknowledges that the fluorescent run up time is significantly impacted by the ambient temperature around the lamp. The acceptable ambient conditions are detailed in the proposed test method found on the ENERGY STAR Lamps V1.0 page . |
| Requirements | Standby Power Consumption | Several comments were received regarding the standby power consumption requirements for connected products. Efficiency groups strongly supported the 0.5 Watt allowance, suggesting over 0.5 Watts would negate the positive efficiency impacts of the products. Several manufacturing partners noted that there are efforts underway to reduce standby power, but the limitations may stifle the innovation in the short term by limiting what features can be included. | EPA recognizes the needs of stakeholders for flexibility and that use of some wireless protocols will not allow the product to meet the requirement. EPA's evaluation has found that there are control protocols available that operate well under the 0.5 Watt requirement. It is expected, for residential use, the majority of the luminaire's powered time will be in the standby state. It is important this power consumption to be kept as low as possible to minimize the impact on the overall energy savings of these products. |
| Connected Products | | A partner requested clarification on consumer authorized entities and protocols for ensuring compliance with interconnection. The partner also inquired about the requirement of an | EPA has reviewed the connected section, and included some simplifications and clarifications to the section to address feedback from stakeholders. EPA continues to request additional feedback on refining these criteria and the approach. |

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| | | <p>energy management system, and requested clarification on the sections.</p> <p>Efficiency program supported the need for connected products to share information, and suggested that the energy used by the product and the relative luminous intensity are key data points that should be reported.</p> | <p>EPA appreciates the feedback on the priorities of energy providers, and seeks additional feedback in regards to operational status reporting.</p> |
| Labeling | Use of consistent CCT nomenclature | <p>A stakeholder raised concerns over the additional marketing costs and relabeling of products to meet the CCT nomenclature requirements. They argued that the Lighting Facts labels and manufacturer kelvin scales are more helpful to users, and many luminaire purchasing decisions are not off the shelf decisions.</p> | <p>EPA recognizes that the market is already utilizing descriptive terms for color temperatures to assist consumers in making the appropriate selections for their needs. As this is already common practice, EPA is not asking for additional labeling, rather is seeking to harmonize the terms for a more consistent consumer message.</p> |
| Serviceability / Replaceability | | <p>A stakeholder noted that many luminaires have components that are intended to be replaced by an electrician, not a homeowner, and in these situations wire nuts are not a safety concern.</p> | <p>The wire nut restriction only applies to LED light engines. Please see the definition of a light engine, which requires the use of a connector to electrically connect the light engine to the mains voltage.</p> |