

Section	Topic	Subtopic	Comment	Response
1.1	Specification Scope & Lamp Classification	Included Products	<p>A partner and a utility group supported the addition of G4 and G9 lamp bases. The partner suggested also adding the Wedge and GY6.35 lamp bases as these are becoming popular LED options for replacing relatively high wattage halogen lamps.</p> <p>An industry group and a partner requested the addition of the ANSI Standard G53 base which is used with lamps which meet the PAR36 outline, including AR111 lamps.</p> <p>A partner recommended GU10 base MR16 lamps be added to the list of included products.</p>	<p>EPA has determined that, due to insufficient stakeholder input, additional scope expansion including Wedge and GY6.35, and G53 base types, and AR111/PAR36 lamp shapes will not be included in version 2.0. Additional shapes and bases may be considered for a future revision. To consider adding these lamp shapes and base types the agency requests information to better understand the market for these products, including specification of the referenced incumbent products, product sales, applications. Additionally, EPA understands challenges exist in LED replacement lamps with these bases to meet both performance of incumbent bulbs and ANSI lamp dimensions and requests information from manufacturers to better understand these challenges and implications of replacement lamp shapes and sizes for specific applications.</p> <p>As for allowing MR16 lamp shapes with GU10 bases, the ENERGY STAR specification relies on ANSI standards for lamp shapes, bases, their combinations, outlines and dimensions. ENERGY STAR Lamps version 1.1 included a new ANSI lamp and base combination, for a PAR16 lamp with a GU10 base. ANSI does not have a standard for an outline or dimensions for an MR16 lamp with a GU10 base.</p>
3	Future Specification Revisions		<p>One efficiency organization recommended that EPA monitor the ongoing DOE test procedure rulemaking for Integrated LED Lamps and for CFLs to ensure alignment.</p>	<p>One of the primary goals of the Lamps version 2.0 revision was to allow for the pending DOE test methods. As such, the specification allows for the use of the DOE test methods once they are final.</p>
4	Definitions		<p>One efficiency organization recommended EPA expand its definition of "color tunable lamp" to include two separate definitions: 1) tunable color, and 2) tunable white based on DOE Lightfair presentation.</p> <p>One industry group requested that the definitions of "Labeled Wattage" and "Rated Wattage" be removed and that the definition of "Lumen Maintenance" revert to the version proposed in Draft 2.</p>	<p>Having a broad definition of "Color Tunable Lamps" gives manufacturers flexibility and helps serve the purpose of the color tunable testing guidance. EPA has adjusted the definition and included additional definitions of color tuning features that also fall under "color tunable" that will be used for displaying product features on the QPL so that partners can clearly and consistently report product features.</p> <p>EPA revised the definition of "Lumen Maintenance" to align with the DOE definition in the CFL Test Procedure NOPR but the change was simply to remove a soon to be outdated reference to the old CFR. If the final test procedure raises implications in terms of the general comparability of products tested under the old or new test procedure, EPA will assess the appropriate next steps for the ENERGY STAR specification.</p>

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5.1	Testing Color Tunable		An industry group recommended the removal of "least efficient" from paragraph 4 to align with EPA's Draft 3 requirement that all tests and evaluations shall be performed at the most consumptive white light setting and that watts, lumens, chromaticity, and CRI shall be tested and reported for default and most consumptive white light settings.	Consistent with the testing and reporting requirement that color tunable lamp testing be performed at the default and most consumptive white light settings, the requirement to provide detailed instructions for reaching the least efficient setting has been removed. Instructions must only be provided for reaching the most consumptive and default settings.
7.1	Product Variations		A partner suggested EPA consider adding two items to the allowable variations for sharing test data, to allow lower power lamps to be included in the same family as a higher power base model and trim accessories (e.g., trim that increases the diameter of a PAR30L lamp to PAR38).	The specification addresses slight variation in input power in the allowable variation section. EPA has not received any data or justification for allowing lower power lamps to be included in the same family as a higher power base model. Additionally EPA did not receive any data to support adding trim accessories as an allowable variation. Technical justification and test data are necessary to support any request for additional product variations.
9.1	Luminous Efficacy		<p>A partner supported the change to a single efficacy requirement and recommended combining all rows of the table to make the table more clear.</p> <p>An industry group proposed the Draft 2 efficacy requirement (55 LPW) be restored for 7W or less decorative lamps and also recommended a separate category be included for color tunable lamps with a 60 LPW requirement.</p> <p>A partner recommended that color tunable lamps be subject to the same efficacy requirements as standard (non-tunable) products. This partner also recommended that 1) the requirement for decorative lamps be split for CFLs [50 LPW (less than 10W) and 55 LPW (10W or more) and for LEDs [55 LPW (3W or less) and 65 LPW (more than 3W)], and 2) the requirement for directional CFL lamps be split [45 LPW (less than 20W) and 55 LPW (20W or more)].</p> <p>An efficiency organization commented that Draft 3 efficacy requirements were not technology neutral and would identify below average lighting products including CFL, and recommended that EPA increase efficacy requirements to ensure that ENERGY STAR products will be able to be lawfully sold in California.</p> <p>A partner urged EPA to set CRI-dependent efficacy requirements. They cited at 15% lumen loss for a CRI increase from 80 to 95. They also suggested that increasing the efficacy beyond 65 lumens per watt would not be fair for high intensity directional lamps that incur an efficiency penalty compares to omnidirectional lights. They commented that raising the directional efficacy requirement above 65 lumens per watt would effectively phase out ENERGY STAR certified directional high CRI offering that are essential to retail and hospitality industries.</p>	<p>After further analysis of market and product efficacy trends in each category, EPA has determined that certified products are performing at higher efficacies and lower price points today than they were when efficacy levels were initially addressed and refined in previous drafts. Stakeholder interests have noticeably shifted, with many who previously requested lower efficacy levels (to maintain cost-effective CFLs in the program) now suggesting that efficacy be raised in conjunction with adjusting other metrics to allow greater design flexibility. EPA received comments from stakeholders and performed additional analysis of market trends and product efficacy trends in each category that helped inform the current proposal.</p> <p>EPA received a proposal from the California Energy Commission to align with their Tier 1 efficacy levels for general service LEDs, citing that 32% of general purpose replacement lamps certified to ENERGY STAR over the last year already meet or exceed the 88.4 lumens per watt level. One regional energy efficiency organization recommended 75 LPW. Several stakeholders asked EPA to consider the relationship between efficacy and CRI. EPA evaluated the current data—which includes an increased number of high-CRI products which showed a stronger trend line than in the past—and found justification for an efficacy/CRI tradeoff.</p>

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9.2	Light Output	Directional	An industry group and a partner pointed out that MRX should be listed in this section along with PAR and MR.	EPA has incorporated this change in the draft final specification.
9.5	Luminous Intensity Distribution	Lamp Shape List	<p>One partner suggested that this section include the clarification that "ALL LED Filament lamps only need to meet the decorative luminous intensity requirements, regardless of ANSI shape."</p> <p>The same partner recommended referring back to the Section 1.1 list of ANSI standard shapes to ensure consistency. This aligned with the comment from an industry group and a partner that ST lamp type was missing from the required list.</p>	EPA has updated the reference in this section but has determined that, because there are already omnidirectional "filament" lamps certified, there is no justification for limiting the scope of filament lamps to the decorative category.
9.6	CCT		One partner supported the inclusion of new nominal correlated color temperatures (CCTs) of 2200 and 2500 Kelvin and recommended EPA consider adding the new CCTs to the Luminaires specification as well, perhaps in a point revision. One utility group recommended that the new nominal CCTs of 2200 and 2500 Kelvin be limited to decorative lamps citing possible consumer dissatisfaction. One efficiency organization recommended the new nominal CCTs of 2200 and 2500 Kelvin be limited to decorative lamps or as part of color tunable or color dimming products citing possible consumer dissatisfaction.	EPA has determined that, due to insufficient stakeholder input on the market demand, current marketing language and marketing terms for these CCTs, additional scope expansion including 2200K and 2500K nominal CCTs will not be included in version 2.0 and may be considered for a future revision.
9.7	CRI		<p>One efficiency organization recommended that some tradeoff between efficacy and CRI may be appropriate for ENERGY STAR at this time. One partner echoed this comment and recommended a CRI-dependent formula be introduced for the ENERGY STAR efficacy requirements.</p> <p>One efficiency organization recommended EPA require that manufacturers report their LM-30-15 test data.</p>	EPA has retained the current CRI requirement as is and has added a reporting requirement to collect Fidelity Index (Rf) and Gamut Index (Rg) values. EPA does not intend to publish the new metrics on the QPL or make the data public until EPA is in a position to move forward with setting requirements.
9.8	Color Maintenance		A partner requested additional language to clarify the test duration is 6,000 hours for this requirement.	EPA has clarified the language of this requirement, consistent with Luminaires version 2.0, to be more specific that it includes any test interval required by ENERGY STAR certification or the test method.
10.1	Lumen Maintenance		<p>An industry group and a partner recommended the CFL language be modified to more clearly denote the requirement for lamps covered (and not covered) by DOE.</p> <p>A partner recommended the ambient operating conditions for CFL testing be reset to V1.1 requirement or another realistic range.</p>	The language for CFL testing covered and not covered by DOE has been clarified as well as the operating temperature consistent with LM-65 and the DOE NOPR for CFL test method.

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10.2	Rated Life		An industry organization and a partner recommended the Draft 3 requirement that "all tested units shall be operational" be restored to the previous requirement that 90% remain operational to align with DOE LED Lamps TP SNOPR.	EPA retained the current proposal that all tested units shall remain operational consistent with the program's interest in ensuring that products carrying the ENERGY STAR mark do not exhibit catastrophic failures in the period of testing required according to the rated lifetime claim.
11.4	Start Time		One Partner commented that a gentle fade-to-on function can be misconstrued in the measurement of Start Time and recommended 1) that the Start Time requirements be revised to exclude "Fade Time," and 2) that the ENERGY STAR Start Time Test Method be opened for revision through stakeholder feedback.	EPA is working with stakeholders to understand the concerns and opportunities to clarify the ENERGY STAR Start Time Test Method to account for fade to on products that are desirable for consumers.
11.5	Run-up Time		An industry group and two partners proposed several alternatives for this requirement that would allow additional time for covered and reflector CFLs.	EPA has maintained the current 45-second requirement in light of historical consumer dissatisfaction with long run-up times.
11.7	Connected Lamps	Standby Power	<p>A utility group supported the "lowest possible" standby power requirement since the standby load is present 24 hours per day and cited a report from the International Energy Agency that suggests the current 0.5 watt standby power requirement is high. While an industry group and a partner suggested current 0.5 watt standby power allowance is too low and recommend the requirement be increased to 1 watt.</p> <p>A partner recommended that this requirement reference Off Mode rather than Off State to prevent confusion and inconsistent test results, since Off Mode is defined in the referenced method of measurement.</p>	EPA has retained the current 0.5 watt standby power allowance and will continue to monitor the market for connected lamps and features offered and the associated standby power use. EPA encourages stakeholders to bring any future opportunities based on products in the market to EPA's attention regarding this requirement. EPA has revised this requirement to use "off mode" language to align with the reference test procedure.
12.1	Dimming		An industry group supported EPA's removal of the four lamps per dimmer requirement and recommended revised language for paragraph 2 to eliminate perceived redundant statements.	EPA has revised the language in paragraph 2 to eliminate perceived redundancy.
12.5	Audible Noise		A partner recommended that all lamps (dimmable and non-dimmable) be subject to this requirement and that the language of the requirement be changed to "Measured acoustic output from the lamp at a distance of 1 meter, at any dimmer setting (if a dimmable lamp), shall be less than or equal to 24dBA" for clarity.	EPA has not received justification that all lamps be subject to a noise requirement. EPA believes the requirement language is clear as is and the proposed language may add confusion.
12.6	Products with Connected Functionality		One partner recommended the numeric standby power reference be replaced with a reference to Section 11.7 to ensure consistency.	EPA has incorporated this change in the draft final specification.
12.7	Connected Product Criteria		A partner recommended that the language of this section be modified to clarify that a connected lamp may connect wirelessly via a home gateway or network controller.	While the connectability for products has been flexible from the onset of the requirements, EPA has added additional specificity to clarify that lamps may connect wirelessly via a home gateway or network controller.

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12.8	Connected Lamps	Open Standards and Open Access	<p>One partner recommended renaming this section "Open Access" citing EPAs intent that the requirements for connected products be flexible to allow innovation in this young product category.</p> <p>Another partner suggested renaming this section "Multi-Vendor Interoperability" and offered alternative language to replace references to "open standards."</p>	Use of open protocols has other implications beyond interoperability with other vendors in the market. Therefore, EPA has renamed this requirement open access rather than multi-vendor interoperability.
12.9	Connected Lamps	Energy Consumption Reporting	<p>One utility group acknowledged the possible cost implications for manufacturers but recommended that EPA require that actual (rather than estimated) power consumption of connected products be reported, particularly for providing information for grid capacity.</p> <p>A partner suggested this section be renamed "Energy Consumption Estimation" and that EPA allow the estimation of energy consumption be provided by the base lamp or the gateway or cloud service connected to the base lamp.</p>	EPA believes that reporting actual power consumption is not a practical requirement for commodity products due to required cost of accuracy and longevity. EPA believes that estimated energy use should be sufficient as outlined in the details of the requirement.
12.10	Connected Lamps	Operational Status Reporting	A partner suggested this section be renamed "Operational Status Monitoring" and that EPA allow monitoring to be performed by the base lamp or the gateway or cloud service connected to the base lamp.	The importance of the requirement is the reporting aspect, and for this reason EPA will retain the requirement heading as is and has clarified in the details the flexibility for meeting the reporting requirement.
14.1	Dimensional Requirements		One partner recommended EPA consider exclusions for LED lamps (specifically those with G4 and G9 bases) to allow these products to exceed ANSI standard envelopes so they can achieve equivalent light output to the most common halogen products they are intended to replace.	Due to insufficient information EPA was unable to consider this request in time for the final draft.
15.1	Lamp Labeling		<p>An industry group requested that EPA remove the "application exception" bullet from this requirement.</p> <p>A certification body suggested revised language to clarify which lamps require labeling to include rated lumen output and which require nominal beam angle.</p>	EPA has removed this requirement as it is sufficiently addressed by safety certification and in the relevant requirement sections of the specification.
15.2	Lamp Packaging		An industry group requested that EPA remove Maximum Starting/Operating Temperature based on discussion during the April 20, 2015 stakeholder meeting.	EPA has removed this requirement from the draft final specification.
15.2	Lamp Packaging	CCT	One partner suggested nomenclature for proposed nominal CCTs: 2200K (sunset light) and 2500K (incandescent light).	EPA has determined that, due to insufficient stakeholder input for establishing consistent terminology, additional scope expansion including 2200K and 2500K nominal CCTs will not be included in version 2.0 and may be considered for a future revision.

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15.3	Warranty		A stakeholder asked whether it is acceptable for manufacturers to maintain a website with warranty details and this website be referenced on the package along with the warranty duration in place of putting the full warranty details on or inside the packaging. This proposal received additional stakeholder support during the October 22, 2015 webinar.	EPA has updated the warranty requirements to include warranty length, phone number, and URL on packaging in lieu of complete written warranty in the packaging.