Proposed Revisions to Select Elements of Draft Version 2.0 ENERGY STAR® Lamps Specification

In light of the rapidly evolving LED lamp market, the Environmental Protection Agency (EPA) is highlighting new proposed changes to the ENERGY STAR Lamps specification in four key areas. In lieu of a Draft 4, the Agency is outlining these specific proposals for stakeholder review, comment and further discussion, which will be considered in the development of a final draft specification later this year. These proposals are informed by further market research and more recent stakeholder input.

Recent developments in the LED lamp market highlight an opportunity for the ENERGY STAR label to be associated with a broader range of high-quality products at lower price points and with increased energy savings. Making room for more low-cost products that have the potential to fully meet consumer expectations means more of the lamps people are most likely to buy will be certified against the full suite of ENERGY STAR requirements, which could ultimately prove pivotal to consumer acceptance of LED lamps over the long term. The objective behind these changes is to strike an appropriate balance among the possible trade-offs.

Rated Life

EPA has heard a range of viewpoints, with most stakeholders advocating for a shorter rated life. Feedback has been provided indicating that a high-quality product can be offered to consumers at a low cost without a dramatic decrease in the rated life. At the same time, EPA has heard from some manufacturers that 15,000 hour designs provide a higher level of quality and reliability than 10,000 hour designs due to the components and materials used for most designs.

As such, EPA is proposing a rated life requirement of 15,000 hours for all LED omnidirectional lamps, which matches the current requirement for decorative LED lamps. (Based on the FTC reporting requirements, this equates to 13.7 years based on 3-hour/day operation.) At the same time EPA is proposing to tighten the requirements for passing the life and lumen maintenance test by requiring that all units (versus the current 9 of 10) be operational throughout the duration of life testing.

Questions for industry and stakeholders

1. EPA has only received suggestions that rated life be reduced for omnidirectional products. Is there any interest in reducing rated lifetime requirement for directional lamps?
2. EPA has received some confidential pricing and performance quality information related to lifetime. Is there any additional information EPA should examine for considerations of lifetime?

Omnidirectionality

ENERGY STAR distribution requirements have played an important role in providing a positive consumer experience with LED lamps. Since the days of the early poorly designed snow-cone lamps, designs have evolved to more effectively deliver light in every direction. Emerging new designs distribute light very closely to the distribution of the current ENERGY STAR omnidirectional requirement at notably less cost. At this stage, EPA believes that minor adjustments to the ENERGY STAR distribution requirements will allow a broader selection of low cost lamps to earn the label without a perceptible difference in performance.

Proposal for Omnidirectional Luminous Intensity Distribution Requirements

EPA is proposing minor modifications to the luminous intensity distribution requirements for omnidirectional lamps:

- For light towards the base of the lamp, at least 5% of total flux (lm) shall be produced in the 130° to 180° zone (versus the 135°-180° zone); and
- At least 80% of the measured intensity values may vary by no more than 35%* from the average of all measured values in all planes in the 0° to 130° zone (versus 90% of values in the 0°-135°zone)

EPA research indicates no discernable difference in consumer satisfaction for these emerging new designs which meet these slightly adjusted requirements.

Power Factor

Information received to date indicates there is a small but not insignificant cost impact to design to the current requirement of 0.7 compared to 0.5. EPA is aware of some lower-cost LED lamps currently entering the market that have power factors of 0.5, 0.6, and 0.8. Stakeholders have pointed out that a 0.5 power factor has been acceptable for CFLs for many years. Power factor has no impact on consumer experience. Additionally EPA has received comments from efficiency programs and industry in support of a 0.5 power factor. A stakeholder shared that the impact to utilities is insignificant and that leading power factor of capacitors actually helps offset lagging power factor of motors in homes helping balance the grid.

Proposal for Power Factor

EPA is proposing to lower the minimum power factor requirement for LED lamps to 0.5, consistent with the current requirement for CFLs.

Questions for Industry Stakeholders

1. EPA has received some confidential pricing information related to power factor. Is there any additional pricing information EPA should examine for considerations for the minimum power factor requirement?

2. Is there any research on potential market implications for reducing power factor that EPA should be aware?

Efficacy

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.

EPA received a proposal from the California Energy Commission (CEC) 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 that in the past—and found justification for a 15% efficacy/CRI tradeoff.

*Corrected typographical error on November 17, 2015.

EPA seeks to help consumers capture greater energy savings with ENERGY STAR light lamps while maintaining a broad selection of products that meet consumer expectations.

Proposal for Efficacy

EPA proposes the following efficacy requirements for 2017:

Lamp Type	ENERGY STAR Requirements	
	Reported values for each lamp model shall meet the applicable requirement in the table below. Additionally eight or more units individually shall meet the requirement.	
	Minimum Lamp Efficacy (initial lm/W)	
	CRI ≥ 90	**CRI < 90**
Omnidirectional	70	80
Directional	61	70
Decorative	65	

The following table shows the performance of currently certified products and pass rates based on this proposal.

Lamp Type	Certified Products	Average ENERGY STAR ALL/LED/90+CRI Efficacy today	Pass Rate current products proposed levels (%)	Pass rate assuming modest (10%) efficacy improvements by 2017 (%)
Omnidirectional	1620	75/82/70	59	73
Directional	4576	69/70/69	54	74
Decorative	698	69/73/66	63	92

Questions for stakeholders

1. Is there additional information that EPA should consider on this issue?

EPA requests that written comments be submitted to lighting@energystar.gov by 5 PM ET on Monday November 23, 2015.