

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460



OFFICE OF
AIR AND RADIATION

October 19, 2023

Dear ENERGY STAR® Lighting Stakeholders:

This letter announces the Environmental Protection Agency's (EPA) release of the final draft of the [ENERGY STAR Downlights Version 1.0 specification](#) (V1.0), intended to replace the Luminaires Version 2.2 specification (V2.2; the "existing specification") for downlights and recessed downlight retrofit kits.

EPA received formal comment on the second draft of the specification from two industry associations (jointly) and one EPA-recognized Certification Body, which are posted at www.energystar.gov/luminaires.

In response to the valuable feedback provided by stakeholders on Draft 2, this final draft includes eased efficacy criteria, as well as clarified naming and scope.

Scope (Section 1)

Based on feedback received from Draft 2 and subsequent dialog with multiple stakeholders EPA has clarified that downlights with integrated light source(s) and apertures of ten inches or less that are intended to be recessed, semi-recessed, surface-ceiling mounted, wall mounted or suspended from a ceiling or wall support are eligible to earn the ENERGY STAR. Recessed downlight retrofit kits with integrated light source(s) and apertures of ten inches or less continue to be eligible for certification.

Definitions (Section 4)

In response to questions about the scope of this specification, EPA has updated the "aperture size," "downlight," "downlight retrofit" and "trim" definitions, added definitions of "aperture," "built-in LED module," and "integral LED module" and removed the "residential downlight" definition. Additionally, the definitions of "direct lighting," "optics" and "MacAdam color ellipses" have been removed. New definitions of "consumer authorized third party", "interface specification," and "open standards" were also added consistent with current program-wide ENERGY STAR connected criteria. Finally, the "rated luminous flux maintenance" and "rated luminous flux maintenance life" definitions were renamed to be consistent with relevant methods of measurement.

Product Families (Section 6.1)

Based on the feedback received from Draft 2 and subsequent dialog with multiple stakeholders, EPA has clarified the light source, LED driver, input power, and diffuser variations that are

allowed within a product family and added an allowable variation for exterior housing finish applicable to suspended, surface-mounted, and wall-mounted models.

Luminous Efficacy, Output and Zonal Lumen Density (Section 8.1)

In response to Draft 2, stakeholders requested that EPA consider a lower luminous efficacy requirement—specifically 80 lumens per watt (lm/W) instead of 90 lm/W as proposed in Draft 2. Stakeholders argued that the 90 lm/W level would increase product cost and a threshold of 80 lm/w would increase engagement and compete better against economical recessed can and low performing A-line lamp combinations. Initial EPA analysis assumed only the current ENERGY STAR integrated downlight levels as the alternative. Thanks to stakeholder-provided photometric data of various bulb configurations in recessed cans, including low performing A-lamps, we were able to assess the potential savings relative to these alternative downlight options.

While an integrated solid-state luminaire or retrofit kit optimizes the energy savings and user experience, consumers can also choose other more affordable options like simply installing a CFL or LED bulb. To the extent ENERGY STAR certified downlights will compete with a broader set of alternatives, it makes sense to consider incremental cost more comprehensively, while ensuring that the ENERGY STAR level produces savings relative to each of them.

The top performing 25% of ENERGY STAR certified downlights have efficacies of 82 lm/W or greater. Further analysis showed this level provides meaningful savings over typical luminaire and most bulb-in-luminaire options. Based on the estimated number of downlights sold each year in the U.S., this level also represents a significant national savings opportunity. As a result, EPA has updated the minimum luminous efficacy requirement to 82 lm/W. Our research revealed little incremental cost -- in most cases an average of less than \$2 -- for integrated downlight products performing at 82 lm/w or greater. We thank all stakeholders for providing data that informed this analysis.

Today, more than 5,400 ENERGY STAR certified downlights and retrofit kits have efficacy \geq 82 lm/w. If all downlights and downlight retrofit kits sold in the United States were ENERGY STAR certified with efficacy $>$ 82 lumens per watt, the energy cost savings would grow to more than: **\$1 billion** each year, save more than **12 billion kWh** and prevent more than **18 billion pounds** of greenhouse gas emissions, equivalent to the emissions from more than **1.8 million vehicles**.

Products with Connected Functionality (Section 14.2)

In this draft EPA reorganized this section and updated terminology consistent with current program-wide ENERGY STAR connected criteria, edits do not change requirements.

Scope Details & Examples (Appendix A)

In this draft, EPA is introducing Appendix A to assist with questions about the scope of this specification as detailed in Section 1. It is critical that partners, stakeholders, EPA-recognized test labs and certification bodies have a clear understanding of which products are in and outside of scope. EPA welcomes feedback, including additional examples that would further clarify whether a product is eligible or ineligible for certification.

Additional Changes

- Removed Section 5.2 which was a holdover from Luminaires V2.2 but not relevant to this specification which requires testing of fully assembled fixtures.
- Clarified that reported light output divided by reported input power must comply with the luminous efficacy requirement. Additionally, adjustable accent lights must meet the zonal lumen density requirement when aimed at nadir (Section 8.1).
- Incorporated alternative methods of measurement and reference documents for start time, transient protection, and standby power consumption. (Section 10).
- Harmonized terminology to be consistent with solid state lighting industry maturation.
- Clarified that a supplemental performance summary would satisfy the labeling and packaging requirements for units of certified models not intended for stocking on retail shelves. Additionally, recommended CCT nomenclature and certification marking requirements previously marked as “optional” were removed. Finally, requirements for the use of the ENERGY STAR mark which previously appeared only in the Partner Commitments are now included. (Section 15.1).

Summary

Stakeholders may comment on this final draft via email to lighting@energystar.gov by **November 1, 2023**. Please indicate “ENERGY STAR Downlights V1 Final Draft Comments” in the subject line. Please note that comments received will be posted to the ENERGY STAR website unless otherwise requested. All documents related to the final draft are posted to www.energystar.gov/luminaires.

As EPA stated previously, the Agency’s intent remains that eligible models currently certified under Luminaires V2.2 may be reevaluated and recertified to this Version 1.0 specification without additional testing. Partners with currently certified products that will remain in scope will receive requests from EPA to submit annual unit shipment data for downlights and retrofit kits shipped in 2023. Verification testing for downlights and retrofit kits will begin in spring 2024.

EPA appreciates your contribution to the development of this specification and welcomes inquiries; please contact me with questions, comments or concerns at jantz-sell.taylor@epa.gov or lighting@energystar.gov. Thank you for your support of ENERGY STAR.

Sincerely,



Taylor Jantz-Sell
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U.S. Environmental Protection Agency