

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



OFFICE OF
AIR AND RADIATION

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Dear ENERGY STAR[®] Partner or other Interested Stakeholder:

The U.S. Environmental Protection Agency (EPA) announces the **ENERGY STAR Requirements for the Use of LM-80 Data** final draft. Once final, this document will replace the *“ENERGY STAR Program Guidance Regarding LED Package, LED Array and LED Module Lumen Maintenance Performance Data Supporting Qualification of Lighting Products.”*

EPA thanks stakeholders for comments submitted in response to the initial draft. EPA has worked closely with stakeholders to address their detailed comments. Based on the substance of those comments, following is a summary of revisions made since the initial draft.

This document, once published, sets an 18-month transition period during which any reports or supplemental cover sheets may comply with these requirements, but after which all must comply for ENERGY STAR certification.

Definitions

- EPA expanded the definitions of Case Temperature and LED Driver Case Temperature Measurement Point and adjusted the definition of Lumen Maintenance to align with ANSI/IES LM-80-15.
- EPA has introduced definitions for Current Density, Multi-die LED Package, and Power Density for clarity.
- EPA updated the definition of Successor as follows:
 - EPA reinstated the requirement that successors have equal or fewer dies than the original subcomponent. In its initial draft EPA proposed removing the die quantity requirement but received compelling input indicating that increasing die quantity would not always result in improved electrical and thermal performance.
 - EPA revised the requirement that successors have ‘the same or higher nominal CCT.’ Due to ongoing confusion about representing products having different CCT than the original certified product, this has been changed to require that successors have ‘CCT in the same chromaticity range as the original subcomponent.’
 - EPA revised the requirement that successors have ‘equal or lower tested subcomponent electrical power dissipation.’ Stakeholders commented that power dissipation was unclear and suggested that ‘equal or lower tested subcomponent electrical input power’ would be a clearer and more appropriate value to evaluate.
 - EPA adjusted the requirement to allow successors to have ‘Equal or lower average current density per LED die’ or ‘equal or lower power density per die.’ EPA believes that this either-or requirement better accommodates multi-junction technology without impacting the eligibility of other LED architectures.

Content of LM-80 Test Reports for ENERGY STAR Certification

- EPA clarified that characteristics required for ENERGY STAR certification that are outside the standard LM-80 reporting requirements may be documented using a cover sheet accompanying the LM-80 report, and has provided a cover sheet example for reference.
- EPA reinstated the existing requirement that the subcomponent description include whether it is an LED package, LED array or LED module in order to assist in the review process.
- EPA added a reporting requirement for average power density per LED die to align with the adjusted requirement for successors.
- For multi-die LED packages, EPA reinstated the requirements that die spacing must be greater than or equal to the tested LED array and that the largest array must be tested. EPA received compelling data that smaller die spacing and larger arrays would not always result in improved electrical and thermal performance, and therefore could not always be represented by the testing of a package with larger die spacing or smaller array.
- EPA expanded the LM-80 reporting requirements for LED dies used in the construction of an LED array that are outside ANSI C78.377 quadrangles. Packages within a defined quadrangle can be covered by LM-80 reports consistent with section 4.3.

Application of LM-80 Test Reports for ENERGY STAR Certification

- EPA clarified that products employing both phosphor-converted and single-color LED packages can demonstrate compliance by referencing separate LM-80 reports for each type of package, as well as by referencing an LM-80 report for the combined array.

Requirements for Successor Subcomponents

EPA has made a minor adjustment to the initial light output, lumen maintenance, and color maintenance requirements for successor subcomponents due to measurement uncertainty.

If you have any concerns about this final draft, please contact me **by Friday July 7, 2017** at (202) 343-9042 or Jantz-Sell.Taylor@epa.gov or Daniel Rogers, ICF, at (908) 233-0554 or lighting@energystar.gov.

Thank you for your continued support of ENERGY STAR.

Sincerely,



Taylor Jantz-Sell
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U.S. Environmental Protection Agency