

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



**OFFICE OF
AIR AND RADIATION**

May 4, 2017

Dear ENERGY STAR® Lighting Stakeholders:

EPA is preparing to finalize the ENERGY STAR Lamps specification version 2.1 and seeks stakeholder feedback on the following refinements to our original proposals:

1. New test method proposed for key light source flicker metrics.

Since the release of the draft of version 2.1, EPA had the opportunity to learn more about the efforts of the National Electrical Manufacturers Association's (NEMA's) Light Systems Division to establish a test method and standard for light source flicker. These efforts resulted in the April 1, 2017 publication of NEMA 77-2017, Temporal Light Artifacts: Test Methods and Guidance for Acceptance Criteria. NEMA representatives have acknowledged that these test methods and standards are subject to change as new data comes to light.

After evaluating NEMA 77 against EPA's proposal for light source flicker, EPA determined that the methodologies and approaches were similar enough to allow for use of NEMA-77 in place of EPA's proposed test method, with a few conditions, to allow for the reporting of the following metrics:

- Percent Flicker;
- Flicker Index;
- Lamp light output periodic frequency.
- NEMA 77 Short Term Flicker Indicator (P_{st}); and
- ASSIST Flicker Perception Metric (M_P)

For the purposes of ENERGY STAR, EPA proposes that testing for light source flicker be performed in accordance with NEMA 77-2017 with the following conditions:

- The value reported for M_P shall be based on analysis of the entire waveform dataset generated by the NEMA 77 test, calculating M_P for each 2-second interval; and
- The waveform digitizer (e.g., oscilloscope) used to capture the waveform data, used for the calculation of P_{st} and M_P , must have $\geq 1000:1$ (60 dB) dynamic range of waveform amplitude.

Many 8-bit oscilloscopes satisfy the requirements for measuring Percent Flicker and Flicker Index, but fail to meet the dynamic range requirements for the NEMA 77 and ASSIST Flicker Metric signal acquisition. Therefore, 12-bit analog-to-digital conversion (ADC) is recommended to meet the dynamic range requirements for calculating P_{st} and M_P .

EPA sees value in the way that the ASSIST metric assesses waveforms directly, avoids technology-dependent complexity, and accounts for human factors using a simple weighting function. Additionally, the ASSIST metric can be used as an analysis tool to provide more information of the nature of the flicker problem by identifying which frequencies contribute to flicker. Because the lighting industry has not fully embraced a single metric for light source flicker, EPA believes that the reported ASSIST Flicker Perception Metric (M_P) data will be useful for ongoing industry development of flicker metrics.

2. Delayed implementation of 15,000 minimum lifetime requirement for Directional lamps.

EPA has been encouraged to delay implementation of the 15,000-hour minimum lifetime requirement for directional lamps and is seeking feedback on a July 3, 2017 implementation date.

Multiple manufacturing stakeholders commented on the 15,000 lamp life for directional lamps, generally in support of the revised requirement. Two stakeholders were in favor of immediate implementation of the new life requirements, whereas 3 other stakeholders recommended adding a 12 month delay prior to implementation, citing both the investment made in current products to meet the 25,000 hour requirement and the need for a product re-design to meet the new levels.

EPA appreciates partner's investments in the program and is sensitive to the business decisions partners make based on the program specifications. The market shows that even the partners who are requesting a delay in the minimum lifetime for directional lamps already have directional LED lamps in the market with lifetime ratings below 25,000 hours.

3. Revised criteria for LED package as an allowable variation.

A manufacturing stakeholder commented that rated thermal resistance of the LED is not a reliable parameter for evaluating LED package variations, and provided data for likely scenarios where a cooler junction temperature was observed on a variant LED with higher thermal resistance.

Therefore, EPA is proposing to revise the first condition for evaluating LED packages as allowable variations to read “the measured junction temperature (T_j) and package case temperature (T_c) \leq the LED package of the representative model.”

Next Steps:

We encourage you to visit the ENERGY STAR (#5001) at LIGHTFAIR next week in Philadelphia, PA from May 9-11.

Please let us know if you have any concerns about these revisions by **Thursday May 18, 2017**. Please indicate “ENERGY STAR Lamps V2.1 Comments” in the email subject line.

Please note that comments received will be posted to the ENERGY STAR website unless otherwise requested.

The strength of the ENERGY STAR program is derived in large part from the active interest and participation of our partners. EPA appreciates your contribution to the development of this specification and welcomes individual inquiries; please contact me with questions, comments or concerns any time at (202) 343-9042 or jantz-sell.taylor@epa.gov or lighting@energystar.gov. For questions pertaining to the U.S. Department of Energy test procedures, contact Lucy Debutts, DOE, at lucy.debutts@ee.doe.gov or (202) 287-1604. As always, thank you for your support of ENERGY STAR.

Sincerely,



Taylor Jantz-Sell
ENERGY STAR Lighting Program Manager
U.S. Environmental Protection Agency