

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



OFFICE OF
AIR AND RADIATION

March 22, 2010

Dear ENERGY STAR Integral LED Lamp Stakeholder, Manufacturer or Other Interested Party:

This letter relays EPA's decision to amend the ENERGY STAR Integral LED Lamps specification.

On December 3, 2009, the ENERGY STAR program published Program Requirements for Integral LED Lamps V1.0 with an effective date of August 31, 2010. The specification included a minimum LED Operating Frequency requirement of 150 Hz, a change from the 120 Hz minimum requirement noted in the three drafts leading to the final document. Following its publication, the ENERGY STAR program received considerable feedback on this change, with many parties requesting reconsideration of the new minimum value.

On January 22, 2010, the Environmental Protection Agency (EPA) distributed a letter requesting partner and stakeholder feedback on a proposal to revert the requirement to ≥ 120 Hz. This proposal was based on several factors:

- stakeholder concern regarding the extent of the opportunity for partners and stakeholders to review and comment on the change to ≥ 150 Hz,
- successful implementation thus far of the ≥ 120 Hz requirement in the ENERGY STAR SSL V1.1 specification, on which the Integral LED Lamps requirement was based,
- some unanswered questions regarding 150 Hz as a stronger minimum requirement than 120 Hz¹

EPA received many comments on the proposed change. [Comments](#) received on this proposed change were mostly supportive, and several parties noted that there was limited research to justify the product redesign expense associated with the higher 150 Hz requirement. Until more conclusive research is available with comprehensive recommendations for operating frequency, modulation depth and other related performance criteria, EPA has amended the Integral LED Lamps specification to revert the LED Operating Frequency requirement to ≥ 120 Hz. Version 1.1 of this specification is available [online](#), with the effective date remaining August 31, 2010.

EPA and the Department of Energy are engaged with lighting industry working groups who are further investigating flicker issues with solid state lighting products. The Alliance for Solid-State Illumination Systems and Technologies ([ASSIST](#)) is currently planning research to better understand human response to LED flicker, while an [IEEE working group](#) is underway to

¹ Note: a comment received after publication of the third draft of the specification referencing a human factor expert's support of a 150 Hz minimum requirement proved erroneous.

provide recommended practices to aid in the design of LED driving systems. Both efforts are currently projected to be completed within a year, at which time their recommendations will be considered for integration into ENERGY STAR specifications covering solid state lighting products.

Please contact me with questions or concerns at (202) 343-9272, or baker.alex@epa.gov, and thank you for your support of ENERGY STAR.

Sincerely,

A handwritten signature in black ink, appearing to read 'Alex Baker', with a stylized flourish at the end.

Alex Baker
Lighting Program Manager, ENERGY STAR
EPA