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

OFFICE OF
AIR AND RADIATION

March 4, 2009

Dear ENERGY STAR Residential Light Fixture Partners and Stakeholders:

With this letter, EPA is proposing changes to the ENERGY STAR specification for Residential Light Fixtures in response to comments received by stakeholders during the public comment period on this specification that ended in November 2008. We would also like to take this opportunity to update you on the process by which LED fixtures can be qualified for the ENERGY STAR label.

EPA is now proposing new stricter requirements in two areas of this ENERGY STAR specification as it applies to fixtures employing LED light engines: limits on correlated color temperature (CCT), and minimum light output requirements. Stakeholders expressed concern that these two areas were not specifically addressed in EPA's current set of requirements for LED based fixtures. The rest of this letter provides background on the recent refinements of the ENERGY STAR specification for Residential Light Fixtures, EPA's response to public comments, and an update on how to qualify LED fixtures for the program. Comments on the proposals for CCT limits and minimum light output should be submitted to RLF@icfi.com no later than Friday, March 27, 2009.

Background on RLF Specification Refinements

In June 2008, EPA amended the Residential Light Fixture specification to incorporate test procedures appropriate for fixtures employing LED light engines. Previously, test procedures cited in the specification were not applicable to solid state technologies, placing LED-based fixtures which could otherwise meet the specification at a disadvantage in the market. With the amendment of the specification to version 4.2, this barrier was removed.

To address comments about particular aspects of the specification, EPA held two public comment periods, the most recent concluding in November, to gather input and develop next steps. Submitted comments centered around three primary issues: the CCTs allowable for qualification of fixtures employing LED light engines, the need for minimum light output requirements, and the standardization of the ASSIST Recommends Vol. 4 test procedure. Comments received are available for review at www.energystar.gov/index.cfm?c=revisions.fixtures_spec.

Response to Comments

Based on these comments, EPA is proposing the following refinements as reflected in V4.3 of the ENERGY STAR RLF specification (draft attached).

CCT Limits:

EPA has received considerable feedback on the topic of correlated color temperatures, specifically regarding which CCTs should be allowable for qualification of residential light fixtures. After reviewing the submitted comments, EPA has concluded that CCT values up to and including 4000 Kelvin and consistent with ANSI C78.377-2008 are appropriate for most broadly ensuring residential consumer satisfaction while allowing design flexibility for fixture manufacturing partners. EPA will continuously monitor this aspect of the program and will consider changes as necessary.

Minimum Light Output:

EPA has also received numerous comments regarding the need for minimum light output requirements for LED light engines employed in qualified fixtures. During the most recent comment period, comments underscored the importance of allowing ENERGY STAR fixture manufacturing partners the design freedom to qualify fixtures with small lumen packages to satisfy those applications which do not warrant significant illumination. Wall sconces and chandeliers were specifically mentioned as applications where design flexibility was important, and where an overly bright minimum light output (per light engine) would restrict that flexibility. Based on the comments received, the proposed version 4.3 of the specification will limit qualification to fixtures exhibiting a minimum LED light engine output of 250 lumens, output exceeding that of a 25W incandescent lamp. Consistent with the EPA's longstanding goal for the ENERGY STAR RLF program of providing quality high efficacy fixtures for every application, this new requirement will allow high efficacy LED-based fixtures to qualify for ENERGY STAR while providing assurance that unacceptably low output products will not be eligible.

Test Procedures:

The Alliance for Solid State Illumination Systems and Technologies (ASSIST) continues to provide recommendations to the lighting industry in support of test procedure standardization efforts, most recently contributing heavily to the finalized IESNA LM-80, *Approved Method: Measuring Lumen Maintenance of LED Light Sources*. The Testing Procedures Committee of the Illuminating Engineering Society (IESNA) has begun the process to develop the ASSIST Recommends Vol. 4 test procedure for LED light engines into a formal industry standard. In addition, several testing labs are equipped for, and/or are currently conducting ASSIST testing, including Aurora, Everfine (China), Intertek, ITL, OnSpex, and Underwriters Laboratories.

As detailed in the RLF specification, the procedure is available for free download on the Alliance's website, complete with a list of LED manufacturers who sponsor ASSIST, at www.lrc.rpi.edu/programs/solidstate/assist/index.asp.

An additional change proposed in this document is an expanded reference to the industry standard for lumen maintenance, IESNA LM-80. EPA had previously indicated that we would

adopt LM-80 on its completion; that process is now finished, therefore a reference to LM-80 is included in this document.

Avenues to Qualification

Solid state lighting (SSL) fixtures are currently addressed by the ENERGY STAR Program under two performance specifications. These two specifications complement each other, have robust requirements to address product quality, and offer a strong program for ENERGY STAR to implement and refine with our partners as the market for SSL continues to evolve.

The ENERGY STAR Residential Light Fixture specification (V4.2, V4.3 draft) addresses light fixtures sold in the residential segment of the lighting industry, using a variety of technologies including SSL. Applications include chandeliers, ceiling mounts, sconces, recessed cans, bath vanities and portables, among others. In a technology neutral way, the specification extends existing RLF efficacy requirements to fixtures employing LEDs based on an evaluation of the enclosed LED light engine (LEDs + heat sink + driver). This source-based approach provides residential fixture manufacturers the freedom to design fixtures using the aesthetically pleasing though sometimes optically inefficient material to which consumers gravitate. LED light engines demonstrated to meet the photometric and electrical performance requirements of the specification can be used to qualify multiple fixtures (in situ thermal testing is required for each fixture design to ensure performance).

The ENERGY STAR Solid State Lighting specification (V1.1) is specific to solid state lighting technology only and addresses specific residential, commercial and industrial fixture applications. This specification references test procedures for measuring the energy efficiency of SSL based fixtures which align with testing conventions for commercial and industrial lighting, requiring testing of light output of the whole fixture (delivered lumens). Fixtures employing technologies other than solid state may not be qualified through these requirements.

For the few fixture types where both specifications apply, partners can consider the requirements of each program and decide which approach best suits their needs for a given product. As stated above, both specifications have robust requirements to ensure quality and high efficacy. Improvements to this overall approach can be made in the future as found to be appropriate.

The ENERGY STAR website has recently been updated to include details of each program, an overview of solid state lighting technology, informative buyer guides, and details of each specification. In addition to informing consumers about this new technology and guiding them to the ENERGY STAR when shopping in this product category, the website should be useful to RLF partners seeking a better understanding of these programs. The new web content can be accessed at www.energystar.gov/lighting.

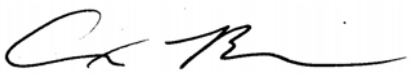
Request for Comments

EPA requests partner comments regarding the addition of the above mentioned CCT limits and minimum light output requirements, outlined in the attached specification final draft. Comments should be submitted to RLF@icfi.com no later than Friday, March 27, 2009. Please note that the attached draft also incorporates recently refined SSL-related definitions from the IESNA (see Definitions beginning on page II), program changes made in 2008 to maximum ballast case temperature testing requirements for portable fixtures using GU24 based integrated lamps (see

table 1), and minor language changes related to fixture qualification processes (namely, references to the newly developed QPI Smart Form and Platform Database). The second attachment is an extract of *Table 4: Indoor & Outdoor Fixtures Employing LED Light Engines for Primary Illumination* for those interested primarily in the LED-related revisions.

In conclusion, we wish to thank all partners and stakeholders who have contributed to the refinement of the RLF specification. We look forward to the introduction of new qualified fixtures meeting ENERGY STAR performance requirements using this exciting technology. As always, please feel free to contact me with questions: baker.alex@epa.gov or (202) 343-9272, and thank you for your interest in ENERGY STAR.

Sincerely,



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