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Via e-mail: lamps@energystar.gov.

May 19, 2013

Ms Taylor Jantz-Sell
Environmental Protection Agency
Energy Star Lighting Program Manager
1200 Penn, Ave NW 6202J
Washington, DC 20460

Re: **GE Lighting Comments on ENERGY STAR Program Lamp Specification v1.0 Draft 4**

Dear Ms. Jantz-Sell,

GE Lighting appreciates the opportunity to comment on draft 4 of the Lamp specification v1.0. As a manufacturer of both CFL and SSL (LED) Lamps we understand the challenges of trying to combine both specifications. While we are able to offer our comments on several technical clarifications and suggestions at this time, we will follow-up to supplement these comments with these and other more substantive comments as further developed by the National Electrical Manufacturers Association by May 24th

While GE recognizes and appreciates the modifications that ENERGY STAR has made to this draft specification in response to stakeholder comment, the specification continues to retain a significant number of non-energy efficiency related requirements. For example, the continued inclusion of the Lamp Toxics Criteria in Section 10 is beyond the scope of ENERGY STAR, and unnecessary given existing voluntary programs. Draft 4 also imposes new requirements in areas traditionally reserved for manufacturers' design discretion, and we believe such expansion threatens to limit innovation in product design. Many of these additions have important implication for the Verification Program, and are difficult to understand without reference to the Verification Program. EPA should make clear in the Specification document how each criterion will be handled in the Verification Program. We will offer further comments on this and other such areas in our supplemental comments.

In addition, areas of Draft 4 continue to risk eliminating entire product categories from the market based on the technical requirements proposed.

11.5 Run-up time

The proposed 120 second run-up for covered CFL lamps is too restrictive. Run-up is a characteristic that suffers as a result of all the additional requirements new, or tightened, in this specification, especially for covered products. A slightly longer run-up time will afford leeway in other areas.

Proposal: Run-up time for covered lamps greater than 15 Watts be 150 seconds

DRAFT 4 also retains a variety of product requirements that, while technically achievable, can only be done at higher product cost and/or testing burden. EPA should further justify the necessity of these requirements given these burdens and/or clarify the requirements given the ambiguity they introduce into the specification as outlined below.

12 Dimming

12.3 Flicker – Recommend increasing the flicker index from less than .12 to less than .15 as required in D3. Since this is a new requirement, it is better to collect more data to ensure the correct flicker index is specified. ENERGY STAR should be monitoring progress being made in this area and maintain the flicker index as set in D3.

In addition, to determine the dominant frequency for flicker, we recommend adding back the option of using the oscilloscope trace to measure the LED driving current. Using the photodiode test method only, you may run into inconsistent measurements, higher cost with multiple sensors and detector combination to ensure that saturation does not happen. Measuring lamp current is easier and a more reliable and consistent measurement.

12.4 Audible Noise

The required number of tests for noise testing is excessive
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10 Dimmers
Configured with 1 Lamp and 4 lamps
Test at Max Lo
Test at Max High
Total tests = 40 tests

Proposal: Based on a significant amount of internal testing, there is not allot of difference in noise level of one particular lamp versus 4 lamps attached to the output of the dimmer. The larger influence factor is where the dimmer setting is at i.e. 100%, 75%, etc.. GE would like to test the dimmer/lamp combination as follows one lamp on the output of a dimmer when the dimmer is set to 50% dim level.

7.1.2 Product variations –

Clarification (LED) : A 2.5C variance in thermal box testing comparing the average of 5 of the product variation and including 5 of the original product is a significant amount of testing (approx. 10 days of testing.) Recommend to lower the number of samples, from 5 to 3, which will still give a statistical average and ensure that the product variant is similar to the original units tested and certified.

Clarification CCT (CFL only)- under the additional test data required for each variant – Lumen Maintenance testing to 40% of rated life and run up time for changing the CCT has no technical benefit. We propose EPA remove this requirement and replace with a requirement that the manufacturers provide 100 hr test data.

9.5 Omnidirectional distribution – (Clarification)– The following verbiage appears in the specification:

90% of the luminous intensity measured values (candelas) shall vary by no more than 25% from the average of all measured values. All measured values (candelas) shall vary by no more than 50% from the average of all measured values.

The above verbiage and supplemental testing shows that 27 points are to be taken and that 90% of those 27 shall vary by no less than 25%. 90 % of 27 is 24.3. EPA should clarify whether this mean that 24 points or 25 points will meet this requirement.

10.1 – Lumen Maintenance (Clarification) -In the supplemental testing guidance for sections 9.1 and 9.2 the following verbiage appears:

For lamps not covered by DOE's regulatory program, all calculations of efficacy values shall be carried out on a per unit basis with directly measured (unrounded) values. A 3% tolerance may be applied to the initial luminous flux value of each unit (e.g. [initial luminous flux of a unit X 1.03]) prior to the calculation of efficacy for the unit. No other tolerances should be applied and the reported value for the sample shall be the average of the calculated efficacies for all units in the sample. The reported value shall be the average of the unit values rounded to the nearest hundredth.

Proposal: This verbiage should be added also to the lumen maintenance, section 10.1 for clarification and consistency

10.1– Early Submission/LM%:

1) **Technical** – The current specifications allows LED lamps to be certified at a faster rate than CFL (3,000 hours versus 40% of rated life (4000 hours based on minimum 10K hour life). This seems to be contradictory to having a technology neutral specification. The requirement for either technology should be at 3,000 hours. CFL – rated life requirement of $\geq$ 10,000 hrs will present a problem for covered CFLs. The EPA is raising the bar for covered products (Candelabra, Globe and Reflector), raising the lifetime

from 6000 to 10000 hours. This becomes particularly problematic for Covered CFLs, since they run hotter than bare CFLs. In Energy Star V4.3, the elevated temperature life test requirement was for Reflector lamps only, with a lifetime requirement of 6000 hours. In Draft 4, the requirement has been increased two steps for the Candelabra and Globes and one step for Reflectors, but it is quite a substantial jump (40% more lifetime). EPA's argument that most Covered products comply with 10 K hours lifetime is not valid, because these lamps were under the actual requirement (at 25 °C open burn, not with the elevated temperature set up). The end result will be an increased cost for the products to improve the components of the electronic ballast. This goes against market penetration, especially considering that there are many applications that don't require high temperature. Also, it is challenging to meet this requirement in high power CFLs (e.g. ≥ 20W). Lastly, as noted in our comments to section 9.1, specialty CFLs are the recommended subject of the latest round of CFL utility rebates, driving cost up or putting harsh requirements both reduce availability, harming rebate plans and energy savings.

Proposal: Allow 8000 hours for covered lamps and maintain 10,000 for bare lamps and allow for early qualification certification at 3,000 hr independent of lamp technology.

2) **Clarification**- In supplemental testing guidance there seems to be a contradiction. Need clarification of the verbiage from the draft found below:

All decorative lamps, omnidirectional lamps < 10 watts, all lamps labeled "not for use in recessed fixtures" on the lamp and lamp packaging and all omnidirectional lamps labeled "not for use in enclosed fixtures" on the lamp and lamp packaging, shall be in an ambient temperature condition 25°C ±5°C.

All directional lamps ≤20 watts and all omnidirectional ≥ 10 watts shall be tested in accordance with Energy Star Elevated Temperature test method using Option A test method or using Test Methods Option B or within operating temperature 45C .

Proposal;: All decorative lamps, omnidirectional lamps < 10 watts, including those lamps labeled "not for use in enclosed fixtures" on the lamp or lamp packaging, shall be in an ambient temperature condition 25°C ±5°C.

3) **Clarification**- In supplemental testing guidance regarding sample size there is some contradiction or clarification needed.

The sample size calls out 10 per model, 5 units tested base up and 5 units tested base down. Going further into the Supplement Testing Guidance the specification calls out Test Method A. In the test method Annex (8.C), Test Method A is restricted to base up only. EPA should confirm whether a manufacturer using Test Method A can test all 10 samples in the base up configuration.

For CFL's covered by DOE the manufacture shall follow DOE testing methods, which means at least 5 BU and 5 BD shall be tested at 25C. Does this mean that CFLs cannot use Test Method A to recieve ENERGY STAR approval? Please clarify

Whether it's CFL or LED, regardless of the lamp type we believe that if Test Method A is chosen, we meet the Lumen Maintainece Requirements in Section 10 if we test 10 samples VBU or 5 VBU or 5 VBD .

14.1 Lamp Shape Dimensions – Typo: (Exemption: non-standard lamps) that category doesn't exist anymore

Test Methods Energy Star for Evaluated Temperature Life Testing. Test Method B, section 9. Testing with radiant baffles needs to be clearly stated that is only required if you are measuring lumen maintenance while the lamps are inside the temperature chamber, like in the case of CFL's. The baffles add no value if you measure lamps outside the chamber (LEDs per LM-79). This was already shown in a technical clarification but would be advantageous to be a part of the newest version of the combined specification.

GE is available to have more detailed conversations on any of the topics detailed above, or to be offered in our supplemental comments. Please do not hesitate to let us know if you have any questions or need anything further.

Sincerely,

Tom Stimac

Senior Consulting Engineer
GE Lighting