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VIA EMAIL TO: lamps@energystar.gov

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

NEMA Comments on Draft ENERGY STAR® Program Lamp Specification v1.0 Draft 4

Dear Ms. Jantz-Sell,

The National Electrical Manufacturers Association (NEMA) appreciates the opportunity to provide the attached comments on the subject proposal. These comments are submitted on behalf of NEMA Lamp and Solid State Lighting Section companies.

As you may know, NEMA is the trade association of choice for the electrical manufacturing industry. Founded in 1926 and headquartered near Washington, D.C., its approximately 450 member companies manufacture products used in the generation, transmission and distribution, control and end-use of electricity.

Thank you for your consideration of these comments. We look forward to working with you further on this important project. If you have any questions on these comments, please contact Alex Boesenberg of NEMA at 703-841-3268 or alex.boesenberg@nema.org.

Sincerely,

A handwritten signature in black ink that reads 'Kyle Pitsor'. The signature is written in a cursive, flowing style.

Kyle Pitsor
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NEMA Comments to ENERGY STAR Specification for Lamps Version 1.0 Draft 4

NEMA thanks the EPA for its careful consideration of our numerous comments to version 1 draft 3 of this specification. We believe a mutually-agreeable specification is within close reach, and through careful consideration of the following comments a useful, fair tool for identifying high-performance lamps can be realized and deployed.

Our specific comments follow:

1. As we have previously stated (see NEMA comments Lamps Spec draft 1), NEMA finds there are still too many requirements in the current draft specification in which ENERGY STAR has made additions which, a) delve into areas reserved for manufacturers' marketing and business decisions or b) tighten existing performance requirements (increased reliability, i.e., few allowed failures before 40% life and life and lumen maintenance testing at an elevated ambient temperature) to the point of limiting innovation, free trade and consumer choice. Assistant Administrator McCarthy acknowledged in her 2011 letters to Senators Bingaman and Murkowski that the widespread use of ENERGY STAR in Federal, State and Local purchasing guidance has made the program increasingly regulatory in nature. By mandating numerous non-energy performance requirements, ENERGY STAR is telling manufacturers how to design their products and forcing commoditization. In a commodity environment, consumers often defer performance in favor of lower prices. EPA must recognize the contradiction of mandating numerous performance improvements, at a corresponding higher cost, while consumer adoption is influenced most strongly by lowering costs.
2. Effective date and implementation path: There are three areas of interest to NEMA members: 1) The date when products in production must comply with the new Lamps v1.0 specification, otherwise known as the Effective Date; 2) The date when certifications to the existing v4.3 and v1.4 specifications stop; and 3) The date when the Qualified Products List will reflect v1.0 products only. For item 1, ENERGY STAR is proposing a 12 month transition period. This is not practical, as the throughput time from when initial testing begins to when a product appears on the qualified products list is about 9-10 months for a 10,000hr CFL. Add to this the 3-4 months required for redesign, preliminary testing, and other administrative needs, and a 12 month phase-in will be inadequate, inappropriate lead time. NEMA recommends an 18 month phase-in period. Regarding item 2, the date when certifications to the existing specifications should stop, we note that ENERGY STAR proposes 9 months after the spec is published; NEMA requests 12 months. This will allow products currently in the development pipeline to be tested, qualified and made available to consumers. Lastly, the date when the Qualified Products List reflects only v1.0 products should be the effective date of the specification. These requests are aimed at preventing both a gap in qualified product availability and also a sufficient amount of selection between qualified products, both on store shelves and in rebate programs during the transition.
3. Many NEMA members continue to have concerns over Covered CFLs having to meet a 10,000 hour life requirement. Many products will be sorely strained in terms of the tradeoff of efficiency versus non-energy attributes related to performance and consumer satisfaction. The EPA's counter argument that there are existing covered products which comply with 10,000 hours lifetime is not entirely valid, because these lamps are tested under dissimilar requirements (25°C open burn, no elevated temperature set up, etc.). The end result will be an increased cost for the products to improve the

components of the electronic ballast, which goes against market penetration, especially considering that there are many applications that don't require high temperature. It will be challenging to meet this requirement in high power CFLs (e.g. $\geq 20W$). Additionally, it will be very difficult for Reflector and Covered products to meet this requirement. Since these products have an outer bulb on top of the discharge tube, they inherently run hotter than bare lamps and the electronic components of the ballast are subjected to higher thermal stress. Lastly, as noted in our comments to section 9.1, specialty CFLs are the recommended subject of the latest round of many CFL utility rebates, and driving cost up and putting harsh new requirements on these products will reduce availability, harming rebate plans and energy savings. With the above in mind, the life requirement for covered CFLs should be lowered to 8,000 hours unless EPA has data to share which shows that numerous models and brands of covered CFLs will be able to meet the new specification.

4. Early submission of products for listing: To harmonize the requirements for individual technologies (i.e. technology neutral) and to reduce qualified product availability risks in view of the myriad new test and performance requirements of the new specification, NEMA recommends that both SSL and CFL technologies be granted an early qualification option at the 3,000 hour test point, subject to typical follow-on test completion and reporting requirements. Our proposed lumen maintenance values for CFLs are given in the table below. (LED LM values are already contained within draft 4.)

| CFL Rated Life | Early Submittal Time | Lumen Maint. % |
|----------------|----------------------|----------------|
| 8,000 hrs | 3,000 hrs | 80 |
| 10,000 hrs | 3,000 hrs | 82 |
| 12,000 hrs | 3,000 hrs | 84 |
| 15,000 hrs | 3,000 hrs | 85 |

5. Section 4 Definitions: The Lamps v1.0 draft introduced a new definition for CFL, taken from IES RP-16-10. It is also very similar to the definition of CFL that was introduced with the new Luminaires specification. NEMA fully appreciates the intent to standardize/harmonize definitions between documents. However, because it calls out specific lamp construction features such as tube diameter and bridging, the new definition is narrower and thus more restrictive, than the definition of CFL which appears in 10 CFR §430.2, and in the existing v4.3 CFL specification. The definition of CFL which appears in the Luminaires specification is appropriate for that document as it is restricted to pin-based CFLs which are the type of lamp described in the definition. We note that IES RP-16 has a separate definition for self-ballasted lamp which was broadly written to accommodate both CFLs and other products such as self-ballasted mercury lamps. This would not be an appropriate definition to use in the ENERGY STAR specification.
 - As an alternative to what appears in the Lamps v1.0 draft, we offer the following definition which has been adopted from 10 CFR §430.2 and is as broad as the definition in the existing v4.3 CFL specification: "Compact Fluorescent Lamp (CFL): An integrally ballasted fluorescent lamp with an ANSI standard base, a rated input voltage range of 115 to 130 volts and which is designed as a direct replacement for a general service incandescent lamp. This definition includes reflector and 3-way lamps (adapted from 10 CFR §430.2)."

6. Section 4: Definitions - Decorative Lamp: NEMA requests EPA clarify this definition, or testing guidance for CFLs, to more clearly indicate that this category does apply to covered CFL A lamps. We suggest adding mention of covered CFL A lamps to the supplemental testing guidance to clause 9.2, and also request EPA provide clarification as to how to test/address covered CFL A lamps which claim ANSI equivalency.
7. Section 6: NEMA appreciates the EPA's efforts to align testing requirements with those of the DOE. However, the alignment is making parts of the specification complicated to decipher, may be in conflict with DOE regulations, and places unnecessary restrictions on the manufacturer. Examples of these are provided below:
Section 6 indicates that where ENERGY STAR and DOE sample sizes are not the same, then the larger ENERGY STAR data set is to be used for DOE regulatory purposes. This is not permitted by 10 CFR 429. The draft specification indicates that the efficacy and lumen maintenance data should come from lamps measured base-up and base-down (unless position restricted by the manufacturer); 10 CFR §429.35 (a)(2)(i) specifies that the data for efficacy and lumen maintenance come from lamps tested in the base-up position only (unless the lamps are position restricted). No allowance is made for base-up and base-down data in the DOE regulation. EPA does not have the authority to change the DOE regulation.

Section 6 also indicates that the values reported to DOE and ENERGY STAR be identical, and come from the same data set for metrics which are common between them. Aside from the base-up/base-down issue mentioned above, this is not a practical requirement due to the way the DOE regulation is written. 10 CFR 429.35 (a)(2)(i) indicates that the represented value, i.e., the value reported to the DOE, be less than or equal to the lower of 1) the average or 2) the lower 97.5% confidence limit divided by 0.95. The key words here are "less than". They permit the manufacturer to make a conservative declaration and report a value to the DOE which is lower than the lesser of either of the two values. Although the draft specification states that "The reported value shall be in accordance with 10 CFR 429", it is not clear if EPA intended to accept this nuance particular to DOE reporting.

The requirement that the same dataset be used for both DOE and ENERGY STAR submittals has the further unintended consequence of specifying that only laboratories which are both EPA recognized and NVLAP accredited can be used for testing to the new Lamps v1.0 specification. Those that are not recognized and accredited may lose business or be forced to incur additional expense to become NVLAP accredited.

We agree that, ideally, data from the same test report could be used for both DOE and ENERGY STAR submittals, however, there are cases where this may not be practical and manufacturers should not be constrained as to the data they use for reporting. An example would be a manufacturer that launches a product, certifies it to the DOE, and later decides to obtain ENERGY STAR qualification. There may be a variety of reasons why the original data cannot be used or why it may be preferable to repeat all the testing for ENERGY STAR. That option should be available to the manufacturer.

In Section 6 and at in least one other place in the specification, a hyperlink is provided to a DOE guidance and FAQ website. Readers are instructed to refer to DOE guidance to determine ratings. Upon checking this website, we do not see any guidance nor FAQs related to ratings of CFLs.

Based on the reasons cited above, NEMA recommends that paragraphs two and three of Section 6 be struck from the document.

8. Clause 7.1, Requirement of new model numbers: EPA has unnecessarily created a conflict with DOE regulations on model numbers, which would appear to whipsaw manufacturers who want to participate in the ENERGY STAR program and put them out of compliance with DOE regulations. The DOE only requires a new basic model number when (i) a manufacturer creates a new basic model or (ii) DOE has determined that the basic model is non-compliant with the federal energy conservation standard and the product is re-rated. The first paragraph of clause 7.1 of Lamps draft 4 is in conflict with 10 CFR 429.12, which states¹ “(e) New model filing. (1) In addition to the annual filing schedule in paragraph (d) of this section, any new basic models must be certified pursuant to paragraph (a) of this section before distribution in commerce. A modification to a model that increases the model's energy or water consumption or decreases its efficiency resulting in re-rating must be certified as a new basic model pursuant to paragraph (a) of this section.” We do not believe EPA has the authority to modify the DOE certification rules, and as a practical matter think it will introduce significant ambiguity and confusion into both the DOE certification processes. We request that EPA remove this portion of the proposed specification.
9. Clause 7.1.2, Product Variations (LED): A 2.5°C variance in thermal box testing comparing the average of 5 lamps of the product variation and 5 lamps of the original product is a significant amount of testing; approx. 10 days of testing. NEMA recommends EPA lower the number of samples from 5 to 3, which will still give a statistically sufficient average and ensure that the product variant is similar to the original units tested and certified, while lowering testing costs.
10. Clause 7, Table 2, Product Variations (CFL and SSL): Regarding CCT testing, the additional test data required for each variant; Lumen Maintenance testing to 40% of rated life and lumen maintenance to 6000 hours (SSL) and run up time (CFL) for changing the CCT, *each have no technical benefit*. EPA Lumen Maintenance Guidance for LED v1.4 allows warmer CCT products to represent cooler variants. With this in mind, NEMA proposes that EPA remove the requirement for additional CCT testing and LM testing and replace it with a requirement that manufacturers only provide initial test data for each variant for both CFL and SSL products.
11. Clause 7, Product Variations, Verification Test: Although the verification procedures have not been issued yet we would like to ask if a product variant fails verification test, does that imply that the representative model will be considered to fail also?
12. Clause 9.1 – Luminous Efficacy: NEMA appreciates the EPA’s attempts to harmonize testing and reporting methods for DOE-covered products. However, regarding testing for luminous efficacy, we prefer the simplicity of a single test method and reporting requirement. We recommend the calculation for luminous efficacy be set as $\Phi_c = \Phi * 1.03$, test methodology of IES LM-66-11 or LM-79-08, referenced to IES LM-54-12, and that the reported value be the Average. Additionally, we believe rounding to two significant digits is not realistic for this measurement, and recommend rounding to the

¹ <http://www.regulations.gov/#!documentDetail;D=EERE-2010-BT-CE-0014-0107>

nearest tenth. We have attached charts at the end of these comments which summarizes this visually.

13. Clause 9.1 Luminous Efficacy - Draft 4 does not include a provision for a lower efficacy for dimmable CFL's as in the current CFL 4.3 version. Dimmable lamps have an inherently lower efficacy due to the additional circuitry required to perform the dimming function. Proposal: Adjust requirements for dimmable CFLs to <15W to 55 lm/W; ≥ 15W to 62 lm/W.
14. Clause 9.2; Light Output. NEMA thanks EPA for the change in draft 4 allowing covered CFLs to be tested as Decorative products. As a clarification, we recommend that the "Decorative" section of this table specifically identify CFLs in the column currently titled "Covered A-lamp" – and we suggest this heading read "Covered A-lamp CFLs"
15. Clause 9.4 Center Beam Intensity: Popular PAR38 Halogen/Incandescent lamps typically have a maximum beam angle of no greater than 40°. Current CFL designs have 120° or more. Therefore, PAR 38 CFLs will not have any reference lamp available for comparison. This effectively eliminates any CFL PAR38 from compliance of this section. Proposal: Exempt PAR38 CFLs from this requirement, since the lamps may be able to meet the ANSI dimensional requirements but cannot meet the light distribution requirements due to technical limitations.
16. Clause 9.5 Omnidirectional distribution – Clarification: Regarding the text "90% of the luminous intensity measured values (candelas) shall vary by no more than 25% from the average of all measured values." We fully agree with that manufacturing tolerances should be taken into account and it is reasonable to change it from 100% to 90%. However, 20% deviation from the average intensity should be sufficient since products are being made which meet this requirement already. Proposal: Adjust the criteria to 90% of the luminous intensity measured values (candelas) shall vary by no more than 20% from the average of all measured values.
17. Clause 9.6; CCT. The pass/fail criterion for CCT testing was changed to 9 out of 10 units, which we appreciate. In the column "Supplemental Testing Guidance," the Passing Test for SSL still states "All units shall fall within the defined 7-step ANSI..." We believe this is an oversight and should be consistent with the 9 out of 10 passing units and suggest it be changed accordingly.
18. Clause 9.6 – CCT: The passing criteria for CFLs need to be moved from the Requirements column to the section on supplemental testing guidance.
19. Clause 10.1 Lumen Maintenance – Clarification: regarding tolerances and variation, we suggest the text of the supplemental testing guidance for Sections 9.1 and 9.2 should be noted early in the specification such that it may be applied to several sections, such as lumen maintenance. The text in question reads "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."

20. Clause 10.1: Regarding the statement “SSL - All directional lamps > 20 watts shall be tested in accordance with the ENERGY STAR Elevated Temperature Life Test using the Option A test method or Option B test method with an operating temperature of 55°C ± 5°C.”, presumably the thought behind this requirement is that higher power lamps will have higher ambient temperatures. This is not the case; in general, since higher power lamps are generally larger in size, they have more extensive heat sinking. Higher power lamps are also being impacted by legislation. Proposal: Change the operating temperature back to 45°C ± 5°C for both Option A and B.

21. Clause 10.1 – Clarification: In supplemental testing guidance there seems to be a contradiction. Clarification of the verbiage from the draft found below is needed: “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.”, and “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.”
 - The above statements are confusing. We suggest EPA craft a table to illustrate this, such as the one shown below (for CFL). (The text in the table is paraphrased from the above quotes. Please note we make some recommended changes, and make a change in accordance with our comment #20.)

Clause 10.1 and related: Table for CFL Life Test discussions and understanding

| Lamp Type | Lifetest Options | | | | |
|--|------------------|----------|---------------|---------------|---------------|
| | 25°C | Option A | Option B 45°C | Option B 55°C | Option C 45°C |
| Any lamp labeled as not for use in <u>enclosed recessed fixtures</u> All omnidirectional lamps labeled as not for used in enclosed fixtures | X | | | | |
| Decorative | X | | | | |
| Omnidirectional < 10W | X | | | | |
| Omnidirectional ≥ 10W | | X | X | | X |
| Directional ≤ 20W | | X | X | | X |
| Directional > 20W | | X | X | X | |

(^ Per comment 20)

22. Clause 10.1 – Lumen Maintenance. We suggest the following:

- Move the requirement that all CFL samples shall be surviving at 1000 hrs to Section 10.2.
- Please clarify what is meant by “Reported values shall meet the requirement for the designated life claim”.
- In the current draft, the EPA seems to allow one SSL failure, but no CFL failures in the final calculation. To fairly align the requirements independent of technology, we propose

this phrase be added to the supplemental guidance for CFL LM testing: “Final Certification Passing Test: The average lumen maintenance of the ≥ 9 surviving units shall meet the minimum requirement for the designated life claim.”

23. Clause 10.3, Rapid Cycle Stress Test: Regarding the requirement that CFLs with a start time of ≤ 100 milliseconds shall survive cycling once per every two hours of rated life, at 5 minutes on, 5 minutes off: European eco-design regulations for non-directional lamps set 300 milliseconds as the differentiation point between instant start and preheat (cathode) lamps. Proposal: Adopt the same differentiation point (300 msec.), for standardization and harmonization purposes.
24. Clause 11.3 – Operating Frequency: For CFLs, keep the existing limit of ≥ 40 kHz. All screwbase CFLs have been designed to meet this requirement. As indicated in the notes section of the draft #3 specification, the supplemental testing guidance was pulled from the SSL v1.4 specification. As such, it will not provide an accurate measurement of CFL operating frequency. This is not a critical parameter and we recommend that CFL manufacturers be allowed to declare the operating frequency until a suitable test procedure is developed.
25. Clause 11.5 Run-up time: Some NEMA members still believe the proposed 120s run-up for covered 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 10 Watts = 150 seconds.
26. Clause 12 Dimming Performance. In the case of low voltage halogen lamps, the inclusion of 3 proposed types of dimmers can only be done if the accompanying transformer is carefully selected. In the test methods, procedures for testing dimmers with low voltage transformers have not been provided. Previously, the EPA has granted exemptions for low voltage lamps in similar circumstances. NEMA proposes that EPA make low voltage MR16 lamps exempt of section 12.
27. Section 12, Dimmer number and selection: After reviewing the amount of testing required for each dimmer/lamp(s) combination, we believe 10 dimmers will result in an excess of testing. Proposal: Reduce the dimmer sample to 5 dimmers for testing instead of ten, but do not preclude partners from declaring a larger number.
28. Clause 12: After further consideration and discussion, NEMA disagrees with mandatory dimmer design topographies. Topography selection should be at the discretion of the lamp manufacturer. Proposal: Remove the requirement that at least one dimmer must have one of the following features: Microprocessor with Power Supply, Voltage Compensation, or Pre-set levels. NEMA supports the comments submitted by Lutron to EPA on this subject and shares their concerns regarding electrical safety and product selection.
29. Section 12, publication of lamp-dimmer data: Since dimming performance testing is not required to be performed by a third party laboratory, nor are the data reviewed by the CBs, the requirement to submit the data to the CB does not add value, it only adds cost. As such, we propose that ENERGY STAR continue to rely on manufacturer declaration and propose that the data be made available to ENERGY STAR upon request and that summary data be available on the manufacturer’s website.

30. Clause 12.1, Maximum Light Output: Actual measurement data should be taken as the baseline light output to calculate the ratio and not rated light output, in order to keep consistency with the test method. Proposal: Change wording from “...shall not exceed the lamp’s rated light output by more than” to “....shall not exceed the lamp’s light output (when operated without a dimmer) by more than.....”
31. Section 12: General comment to supplemental testing guidance, all clauses re: Sample size. It is not appropriate to limit the compatible number of lamps per dimmer. For example, some dimmers may only be compatible with 2 lamps for some reason. We suggest ENERGY STAR not inadvertently mandate dimmers that only work with 1 or 4 lamps. Proposal: Add wording as such: Sample size: 1 lamp per dimmer and 4 lamps per dimmer (or as indicated by the manufacturer of the dimmer as to the minimum and maximum ratings/number.)
32. Clause 12.3, Flicker: As a first ENERGY STAR specification on flicker, we suggest that EPA use the original version found in Draft 3, and tighten the spec as necessary in the future once more data is available. Flicker complaints are not high and not all applications need flicker considerations below 0.12 at 120 Hz. Cost will increase to meet the tighter flicker specification. In general, energy storage within the lamp will have to increase in order to decrease flicker. Proposal: Return requirements to flicker index <0.15 at 100 Hz, increasing linearly to 0.50 at 800 Hz, to apply at full and dimmed measurement conditions. In addition, to determine the dominant frequency for flicker, we recommend reinstating the recently-removed method of using the scope trace to measure LED drive current as an alternative to the photodiode test method. Measuring lamp current is an easier, more reliable measurement, though it does require disassembling the lamp.
33. Clause 12.4, Audible Noise: The required number of tests for noise testing is excessive. Currently the specification calls for 10 Dimmers, Configured with 1 Lamp and 4 lamps, Test at Max Lo, Test at Max High, or 40 Total tests. To reduce the amount of testing and time required, we propose testing lamp dimmer combinations with each dimmer set at 50% power and use a single lamp. The 50% power setting is widely agreed to be the worst case for noise. Using the previously recommended 5 dimmers, this change results in 5 tests, rather than 40.
34. Section 13 Lamp Toxics Reduction: NEMA recognizes the desire of the ENERGY STAR program to promote low levels of mercury and other toxic substances in products, in this case CFLs. In evidence of our shared interest in that subject, industry established the NEMA Voluntary Mercury Commitment program several years ago. This program today is the management tool for the ENERGY STAR CFL program for mercury levels. NEMA routinely reviews the requirements of this program and will have completed a review by the time the ENERGY STAR Lamps specification enters preparations for version 2, at which time industry and government may revisit this topic. ENERGY STAR’s proposed approach for Lamps draft 4 also does not adhere to the long-held practice of referencing existing specifications, guidelines and standards. Instead, EPA has developed its own proposal with pieces selectively pulled from existing guidelines. For example, despite EPA’s stated preference for mimicking RoHS levels for other toxics, the levels of mercury proposed in the Lamps specification do NOT align with RoHS. RoHS specifies 2.5 mg and 3.5 mg, with a wattage break at 30W, the ENERGY STAR proposal specifies different mercury levels for higher wattage lamps, and differentiates the categories at a different wattage break than RoHS and NEMA. There is no basis for these numbers. If

the EPA insists on setting mercury levels in this specification, we recommend EPA continue to reference the NEMA commitment which has been in place since 2007 and has been the basis for state mercury content laws.

Mercury content levels in CFLs should be left up to industry, particularly since it is a non-energy attribute with no energy efficiency correlation. There are, however, strong correlations between mercury levels and lamp performance. Extremely low levels of mercury can cause poor lamp performance and even failure. Mercury starvation, often evidenced by a pink glow in the lamp, is a common end of life failure mode. Mercury is not only essential to the fluorescent process, it is “consumed” over time as it is absorbed into the glass surfaces, captured between phosphor molecules and bonded with filament materials or other materials inside the tube. This consumption must be accounted for in lamp design and mercury dosing. It is true that some manufacturers use amalgam which helps reabsorb and re-release mercury into the lamp, but it is important to note amalgam does not prevent absorption into other surfaces and its primary function is to regulate mercury vapor pressure inside the tube. Given that EPA is insisting on 25% longer CFL lifetimes, it is contradictory to mandate drastically reduced mercury levels, especially in light of the considerations NEMA makes throughout this document regarding feasibility concerns of the myriad new high-performance requirements in the Lamps specification.

To summarize, NEMA believes that the “RoHS-Type” requirements for material content should be removed from the Lamp 1.0 standard consistent with other ENERGY STAR Standards. If they are not removed, EPA should simply require the NEMA mercury commitment levels be met using the same mercury levels and wattage breaks. We note that this requirement improves on the current standard since the current NEMA commitment is 20% lower than the current ENERGY STAR CFL specification.

35. Section 13 Lamp Toxics Reduction: RoHS. We note that other ENERGY STAR programs do not include toxics reduction as part of their specifications, and other product sectors have pushed back on their introduction. For sake of consistency and fairness, EPA should not include them in the Lamps Specification either. Since there are no U.S. Federal restrictions for toxic materials in lighting products, and considering that several States are considering legislation for toxic materials, we strongly suggest ENERGY STAR not include Toxics Reduction considerations in this Specification until the U.S. government has issued clear guidance through an appropriate authority and process. Otherwise, EPA is only contributing to confusion and complexity of an issue that should be addressed nationally. This happened in recent years with mercury-labeling and took years to sort out. Similar confusion and drain on resources should not be repeated.
36. Clause 14.1 Lamp Shape Dimensions – Typo: “(Exemption: non-standard lamps)”. We suggest this wording be changed to “(Exemption: Non-standard CFL lamps)”.
37. Clause 15.1 Lamp Labeling: Remove the first bullet point “ENERGY STAR partner, lamp manufacturer or brand name”; the information is not always printed on the lamp. The lamp model number will be enough to identify whether or not the lamp is a qualified product, and historically that has been sufficient for ENERGY STAR, DOE, and the FTC.
38. Clause 15.2 Labeling. Due to continuing challenges with packaging and labeling, we request that the requirements exempt model number and retail SKU number, allowing

these to be located on the bottom of the package, etc., for packages less than 48 square inches in area. Anything otherwise will be difficult, or nearly impossible on smaller lamps such as MR16, R12, etc. We ask EPA to consider that FTC requirements alone consume up 30% of the available packaging space by themselves (See 58 FR 2070, 2155 (Jan. 6, 1993)).

39. Clause 15.2 Labeling: We appreciate that EPA accepted our previous comment to change references of “Operating Temperature” to “Starting Temperature”. On further discussion, we ask that for labeling, the choice of whether to declare it “operating” or “starting” be left to the partner’s discretion, since opinions still vary on which term is most appropriate for consumer understanding.
40. Test Method, Elevated Temperature Testing – Clarification: In Test Method B, section 9, it should be clearly stated that testing with radiant baffles is only required if one is measuring lumen maintenance while the lamps are inside the temperature chamber, as is the case for CFL’s. The baffles add no value if one measures lamps outside the chamber (i.e. LEDs, per LM-79). This was already given in a technical clarification to a previous specification but would be advantageous to be a part of the newest version of the combined specification.
41. Test Method, Start Time: The oscillogram in Section 9.1 needs to be replaced. The beginning of the start time should be shown to start when the input voltage is applied, not a few milliseconds later when the starting pulse is applied to the lamp. Text needs to be added to clarify that the arc voltage is shown for illustration only and does not need to be measured (to ensure consistency from one CB to the next).
42. Test Method, Light Output on a Dimmer, Light Source Flicker, and Noise: Section 8 – Test Report: Item A needs to be clarified to indicate that information for both the lamp and dimmer needs to be supplied.
43. Test Method, Light Output on a Dimmer: Under the Test Conduct section 6.1 C, power factor and total harmonic distortion are required to be taken at each measurement point. However, the report (Section 8) does not require these values to be reported. Proposal: For the interest of saving testing time and cost, remove the power factor and total harmonic distortion test and reporting requirement.
44. Test Method, Dimming: We suggest several adjustments to this requirement to reduce testing time and to allow multiple dimming tests to be conducted simultaneously. These reductions can be reevaluated after testing results for many lamps are tabulated and analyzed, and test procedures and requirements revised in a future specification. Until then, the burden of conducting these tests should be minimized.
 - a. The 6-test point requirement for noise is excessive, especially at 1 meter distance. This is an overly sophisticated test setup for such a simple test. Directionality of the noise is not a factor, so multiple test points only increases cost. Reduce this to one test point, in Base Up position since BU is thought to be the most challenging position for most performance tests.
 - b. Please state clearly that Partners/Labs may conduct the tests for Light Output, Flicker and Noise simultaneously, as their test conditions and equipment permit. (EPA could also address this in an FAQ post-publication.)
 - c. Regarding published, and reported, dimmer compatibility: many dimmer manufacturers claim electrically equivalent performance in certain families of dimmer. The EPA should state that Partners who test one of these representative

dimmers be allowed at their discretion to report on their websites and in lamp packaging compatibility with the entire represented dimmer family. This is not meant to preclude or eliminate the required evaluation of 5 dimmers with an individual lamp model per Section 12.

- d. New Definition of Stabilization for Dimming Test: we suggest that, to minimize testing time and burden, Stabilization for the dimming section tests be the same amount of time recorded for Stabilization for that same lamp model in initial ENERGY STAR testing, rather than have to measure 0.5% variability each time. Additionally: we suggest that when dimmers are "switched in", that restabilization time be set at 5 minutes for sake of minimizing testing time and cost.

NEMA charts re: comment #12

ES Lamps Spec v 1 draft 4 as written

Energy Star Lamps v1.0, Draft 4 – Section 9.1 Analysis

| Lamp Type | Base Type | Method of Measurement | Reference Document | LPW Calculation** | Rounding | Reported Value |
|-----------|--|-----------------------|--------------------|------------------------|----------|---------------------------------|
| CFL | E26† (Reflectors and 3-ways excluded) | LM-66-91 * | Not specified | $\Phi_c = \Phi$ | X.X | In accordance with 10 CFR 429 ‡ |
| | E26 Reflector | LM-66-11 | LM-54-12 | $\Phi_c = \Phi * 1.03$ | X.XX | Average |
| | E26d (3-way) | LM-66-11 | LM-54-12 | $\Phi_c = \Phi * 1.03$ | X.XX | Average |
| | Other bases within scope (E11, E12, E17, GU24, GU5.3, GX5.3) | LM-66-11 | LM-54-12 | $\Phi_c = \Phi * 1.03$ | X.XX | Average |
| SSL | Any base within scope | LM-79-08 | LM-54-12 | $\Phi_c = \Phi * 1.03$ | X.XX | Average |

Φ = Initial luminous flux value of each unit

Φ_c = Luminous flux value of each unit used for the LPW calculation

* From Appendix W to Subpart B of 10 CFR 430 which refers to v2.0 of the CFL specification which references LM-66-91

** 1.03 factor may be applied to the initial luminous flux value of each unit

† CFLs covered by the DOE's regulatory program are indirectly defined as medium base CFLs without reflectors or 3-way capabilities

‡ 10 CFR 429.35 (a)(2)(i) indicates that the represented value, i.e., the value reported to the DOE, be less than or equal to the lower of 1) the average or 2) the lower 97.5% confidence limit divided by 0.95. The key words here are "less than". They permit the manufacturer to make a conservative declaration and report a value to the DOE which is lower than the lesser of either of the two values. It is not clear if Energy Star intended to accept this nuance particular to DOE reporting.

NEMA proposal:

Energy Star Lamps v1.0, Draft 4 – NEMA Recommendation

| Lamp Type | Base Type | Method of Measurement | Reference Document | LPW Calculation** | Rounding | Reported Value |
|-----------|-----------------------|-----------------------|--------------------|------------------------|----------|----------------|
| CFL | Any base within scope | LM-66-11 | LM-54-12 | $\Phi_c = \Phi * 1.03$ | X.X | Average |
| SSL | Any base within scope | LM-79-08 | LM-54-12 | $\Phi_c = \Phi * 1.03$ | X.X | Average |