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Vice President, Government Relations

November 30, 2016

Submitted online at: <http://www.energy.ca.gov/appliances/2016-AAER-04/>

Ms. Soheila Pasha
California Energy Commission
1516 Ninth St, MS-4
Sacramento, CA 95814

NEMA Comments on Proposed Updates to the Voluntary California Quality LED Lamp Specification

Docket Number: 2016-AAER-04

Dear Ms. Pasha,

As the leading trade association representing the manufacturers of electrical and medical imaging manufacturers, the National Electrical Manufacturers Association (NEMA) provides the attached comments on the California Energy Commission's Proposed Updates to the Voluntary California Quality LED Lamp Specification. These comments are submitted on behalf of NEMA Light Source Section and NEMA Luminaire Section member companies.

NEMA, founded in 1926 and headquartered in Arlington, Virginia, represents nearly 400 electrical and medical imaging manufacturers. Our combined industries account for more than 400,000 American jobs and more than 7,000 facilities across the U.S. Domestic production exceeds \$117 billion per year.

Please find our detailed comments attached. Our member companies count on your careful consideration of these comments and look forward to an outcome that meets their expectations. If you have any questions on these comments, please contact Alex Boesenberg of NEMA at 703-841-3268 or alex.boesenberg@nema.org.

Sincerely,



Kyle Pitsor
Vice President, Government Relations

NEMA Comments on Proposed Updates to the Voluntary California Quality LED Lamp Specification

NEMA and its members appreciate the opportunity to offer comments to the proposed specification. Proposed changes to actual text are indicated in ~~strikeout~~ and underline to reflect our proposed text to ~~remove~~ or add, respectively

1. Controls Requirements: The Commission should amend the language regarding lamp dimming on page 13 of 18 of the proposed specification to clarify that dimming levels below 10% are allowable.

Proposed Change: “Lamps that claim to be dimmable shall dim down to 10 percent Output or less, have reduced flicker operation, and...”

2. Lumen Maintenance and Rated Life: We note that the CEC in referring to the DOE test procedures is in effect requiring that lifetime testing be conducted using IES Standard LM-84. Much of industry still uses LM-80 and TM-21 for measuring and projecting the lumen maintenance of LED lamps. LM-84 is still relatively new and hasn't received wide industry adoption. As we noted in our comments to the U.S. DOE's rulemaking for LED Lamps Test Procedures¹, requiring LM-84 and TM-28 exclusively will place an additional financial burden on the industry and delay certification of products unnecessarily. The challenge with using LM-84 is that it takes upwards of 10 months to complete this testing. This long test time conflicts with CEC's intent to use this new specification beginning 1/1/2017. Even if lamps began testing today, before the CEC LED Quality Specification was finished, they cannot complete lifetime testing until late 2017, well after the implementation of the specification and utility rebate program's needs. To alleviate this, CEC should allow manufacturers to express lifetime in terms of chip-level testing according to IES Standard LM-80 until LM-84 testing is completed for these lamps. While LM-84 is relatively new, LM-80 is successful and well-established and test data already exists for LED chip subcomponents. We request the CEC add a clarification that LM-80 test data may be used to calculate and report LED lamp lifetime until LM-84 testing is completed for individual lamps.

Proposed Change: Add text to the clause for Lumen Maintenance and Rated Life which states “The test procedure for Lumen Maintenance is the DOE LED Lamps Test Procedure, which relies on IES LM-84. Due to the long duration needed to measure lumen maintenance according to LM-84, manufacturers may calculate estimated lamp lifetime using IES LM-80 test data until LM-84 testing is complete for a given lamp.” -- Or text to that effect.

3. We note that LED Downlight retrofit kits are treated as luminaires in Title 24 Appendix JA-8, but they are treated as Lamps in Title 20 regulations. We propose the CEC alleviate the preceding concern (Item 2 above) for LED Downlight retrofit kits with respect to LM-84 testing and remain consistent with Title 24 requirements for these products.

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<http://www.nema.org/Policy/Documents/EERE2011BTTP0071%20NEMA%20comments%20LED%20Lamps%20TP%20SNOPR%20August%202015%20v6.pdf>

Proposed Change: add text to the Lumen Maintenance and Rated Life clause to state that “LED Downlight Retrofit Kits may be tested for lumen maintenance and lifetime claims using IES LM-80, in accordance with Title 24 Appendix JA-8 2016”.

4. Comment on CCT: We applaud the Commission’s proposal to expand allowable lamp CCTs to include the full range standardized in ANSI C78.377-2015². However, for the reasons given below, we request clarification on the CCT range designations printed at the beginning of Chapter 2 (“between 2,200 K and 7,000 K”) and in the Performance Metric Comparison table (“2200-7000”, p. 10).

Manufacturers normally interpret “2200” (Kelvin) as a reference to the ANSI nominal CCT listed in the standard (Annex B, Table B1, first column). The lowest and highest nominal CCTs given in this standard are 2200 and 6500 K, representing measured values from 2180 to 6872 Kelvin as defined by the target CCTs and their tolerances listed in the second column. The nominal “2200 K” corresponds to a target CCT of 2238 Kelvin with a tolerance of ± 58 K, creating a band of compliance from 2180 to 2296 Kelvin. The moniker “2200 K” (e.g. on lamp or luminaire packaging) therefore refers to measured product values of 2180 to 2296 Kelvin. Likewise, with 4-step CCT tolerance, nominally 3000 K refers to a target of 3045 K with a tolerance of ± 100 K, thus allowing compliant product measured values from 2945 to 3145 Kelvin. Please note that there is no ANSI nominal 7000K, and such a measured value would exceed 6872 K, the upper limit value of the ANSI 4-step standard.

The use of “between” in Chapter 2, calls into question whether “2200” should be understood as a nominal or a measured value. When stating “between”, it is not clear if the Commission intends to require actual measured product values to be above 2200 Kelvin, not inclusive of 2180 to 2200 K within the nominal 2200 K quadrangle. On the upper end, it is also not clear if the Commission will consider all measured product values up to 7000 K compliant, rather than up to 6872 K.

For simplicity, our recommendation to the Commission is to maximize the utility of the ANSI standard by simply referencing ANSI C78.377 Annex B Table B1 without any further notations (meaning, eliminate all references to 2200 and 7000 K). Simply referencing the ANSI standard will allow LED lamp measured values of 2180 to 6872 Kelvin, and will prevent any CCTs measuring higher or lower than that range.

Proposed Change: At Chapter 2 page 10 of 18

“The lamp must be capable of producing white light, meaning light with a correlated color temperature ~~between 2,200 K and 7,000 K~~ measured and expressed per ANSI C78.377-2015, Table B1.”

At Table 2, Performance Metric Comparison

Change the CCT row, right hand column: ~~2200-7000~~ ANSI C78.377-2015, Table B1
(Note: this is identical to the reference in the cell below, thus assuring consistency)

5. LED Downlight Requirements Conflict: NEMA remains concerned that the CEC continues to allow conflicting requirements between Title 20 and Title 24 Appendix JA-8.

² <http://www.nema.org/Standards/Pages/American-National-Standard-for-Electric-Lamps-Specifications-for-the-Chromaticity-of-Solid-State-Lighting-Products.aspx>

As we noted in our comments of January 22, 2016³, there are conflicting requirements for LED Downlight products which should be eliminated. We firmly disagree with any sentiment within the CEC that would promote or attempt to justify the application of two similar but still mutually exclusive sets of requirements for the same product class. Many of the CEC's financial justification arguments count on economies of scale to mitigate potential price increases resulting from elevated standards or test requirements. Pushing for two sets of performance requirements that cannot be reconciled by a single product design specifically defeats economies of scale by requiring two product lines for what *in the eyes of the consumer is the same product*.

6. Color Rendering Index (CRI): We also reiterate our strong disagreement with a comprehensive requirement that individual CRI R-factors R1-R8 be 72 or greater⁴. Because of technology and manufacturing realities, such a requirement is a back-door requirement for overall average CRI of 90. Lamps of slightly lower CRI (though noticeably higher than almost all CFLs) are enjoying strong nationwide sales. There is still no evidence that high CRI lamps will produce appreciable consumer uptake or satisfaction.
7. Standby power: We note that the specification proposes an effective date of 1/1/18. In the latest Title 20 regulation, the effective date for standby power was moved back 6 months to 7/1/19 to give industry more time to meet the very aggressive limit of 0.2W. Therefore, it is extremely unlikely that connected products will meet an even closer deadline proposed in the voluntary specification. We strongly recommend that the limit on standby power either be dropped from the specification or changed to 0.5W and that the deadline for standby power limits take effect one year earlier than Title 20, on 7/1/18, to match the timing of the other elements.

³ <http://www.nema.org/Policy/Documents/15AAER6%20NEMA%20comments%20on%20Title%2020%2015-day%20Revised%20Language%20LED%20and%20Small%20Dia%20Lamps%2022Jan16%20final.pdf> Page 12

onward

⁴ Footnote 3, page 2