

**KYLE PITSOR**

Vice President, Government Relations

September 7, 2017

VIA EMAIL TO: [ApplianceStandardsQuestions@ee.doe.gov](mailto:ApplianceStandardsQuestions@ee.doe.gov)

Ms. Lucy deButts  
US Department of Energy  
Buildings Technologies Office EE-5B  
1000 Independence Avenue SW  
Washington, DC  
20585-0121

Re: NEMA Comments on Request for Information: Test Procedures for General Service Fluorescent Lamps, General Service Incandescent Lamps, Incandescent Reflector Lamps

Docket Number: EERE-2017-BT-TP-0011  
Regulatory Information Number: 1904-AD85

Dear Ms. deButts,

As the leading trade association representing the manufacturers of electrical and medical imaging equipment, the National Electrical Manufacturers Association (NEMA) provides the attached comments on the Department of Energy Request for Information regarding Test Procedures for General Service Fluorescent Lamps, General Service Incandescent Lamps, and Incandescent Reflector Lamps. These comments are submitted on behalf of NEMA Light Source Section Member companies.

NEMA appreciates the DOE's efforts to update current test procedures to reflect progress in related industry standards and test procedures. For the most part, updating to current versions will not cause any anticipated negative issues unless their incorporation would require 100% retesting of currently-certified products. An exception to this exists in the test procedures for General Service Fluorescent Lamps (GSFL) for which the most current standards add test conditions using high frequency reference ballasts. Further details may be found in our comments that follow.

NEMA, founded in 1926 and headquartered in Arlington, Virginia, represents 350 electrical and medical imaging manufacturers. Our combined industries account for more than 350,000 American jobs and more than 6,500 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 and we 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](mailto:alex.boesenberg@nema.org).

Sincerely,



Kyle Pitsor  
Vice President, Government Relations  
National Electrical Manufacturers Association

**NEMA Comments on DOE Request for Information: Test Procedures for General Service Fluorescent Lamps, General Service Incandescent Lamps, Incandescent Reflector Lamps**

NEMA Comments on Table II.1:

| <b>Industry Standard Referenced in Appendix R</b>  | <b>Updated Version if Available (DOE List)</b>  | <b>NEMA Comments</b>  |
|--|---|---|
| ANSI C78.375 version 1997 <sup>3</sup><br>(section 4.1.1 of appendix R)                      | ANSI C78.375A <sup>4</sup> version 2014         | No known issues   |
| ANSI C78.81 version 2010 <sup>5</sup><br>(section 4.1.1 of appendix R)                       | ANSI C78.81 version 2016 <sup>6</sup>           | We do not support adoption of this standard. See item b below.  |
| ANSI C78.901 version 2005 <sup>7</sup><br>(section 4.1.1 of appendix R)                      | ANSI C78.901 version 2014 <sup>8</sup>          | We do not support adoption of this standard. See item b below.<br><br>For sake of completeness, we note that there is a more current standard, the 2016 version, not the 2014 version cited by DOE in the NODA. |
| ANSI C82.3 version 2002 <sup>9</sup><br>(section 4.1.1 of appendix R)                        | ANSI C82.3 version 2016 <sup>10</sup>           | No known issues   |
| IES LM-9 version 2009 <sup>11</sup><br>(sections 2.1, 2.9, 3.1, 4.1.1, 4.4.1 of appendix R)  | No updated version available                    | Agreed  |
| IESNA LM-58 version 1994 <sup>12</sup><br>(sections 2.1, 4.4.1 of appendix R)                | IES LM-58 (retitled) version 2013 <sup>13</sup> | No known issues   |
| IES LM-45 version 2009 <sup>14</sup><br>(sections 2.1, 2.9, 3.2, 4.2.1, 4.2.2 of appendix R) | IES LM-45 version 2015 <sup>15</sup>            | No known issues   |
| IESNA LM-49 version 2001 <sup>16</sup><br>(section 4.2.3 of appendix R)                      | IES LM-49 (retitled) version 2012 <sup>17</sup> | No known issues   |
| IESNA LM-20 version 1994 <sup>18</sup><br>(sections 2.1, 2.9, 3.3, 4.3 of appendix R)        | IES LM-20 (retitled) version 2013 <sup>19</sup> | No known issues   |
| CIE 13.3 version 1995 <sup>20</sup><br>(section 2.1, 4.4.1 of appendix R)                    | No updated version available                    | Agreed  |
| CIE 15 version 2004 <sup>21</sup><br>(section 4.4.1 of appendix R)                           | No updated version available                    | Agreed  |

“Additionally, DOE also requests comment on the benefits and burdens of adopting any industry/voluntary consensus-based or other appropriate test procedure, without modification.”

NEMA Comment: By adopting existing standards “without modification” the DOE reduces the burden of accrediting test labs to modified procedures solely for the DOE and testing to the original standards for other programs like ENERGY STAR or the State of California’s standards. Also, there is less chance for mistakes if there is “one” test procedure for all of these programs.

## Regarding Industry Standards and Table II.1

- a) DOE requests comments on referencing the updated versions of ANSI C78.375 and ANSI C82.3. NEMA Comment: we have no objection to, and no known issues that would arise from, adopting C78.375-2014 or C82.3-2016.
- b) DOE requests comments on modifying the test procedure to test at high frequency settings unless only low frequency settings are provided. DOE is seeking information to determine the extent of change in efficacy, if any, if lamps are tested at high frequency instead of low frequency settings. In particular, DOE would welcome test data for all or any relevant lamps showing lumen and wattage measurements for the same lamp at both low and high frequency settings. NEMA Comment: We do **not** support adoption of the C78.81-2016 and C78.901-2016 ANSI standards for testing linear fluorescent lamps. The current linear fluorescent DOE efficiency standards, as well as the standards effective on January 26<sup>th</sup>, 2018, are based on test procedures in C78.81-2010 and C78.901-2005. Compliance to the existing linear fluorescent standards has to remain linked to these original testing standards upon which the efficiency standards were developed. If the 2016 ANSI standards are immediately adopted, the apparent measured efficiency of certain fluorescent lamp types will increase. While adoption of the new standards will have no effect on products already measured on high efficiency settings, fluorescent lamp types now measured on low frequency settings will show an apparent measured efficiency increase of approximately 5 to 10% when measured at high frequency settings. Part of this increase is due to more efficient lamp operation at high frequency and part is due to the lack of cathode heat during high frequency operation. This apparent efficacy increase could allow certain lower-efficiency lamps to re-enter the market if adopted by DOE.

In addition to the critical efficacy measurement issue mentioned above, retesting all fluorescent lamps that have been measured using the existing test procedures with the high frequency test procedure would result in a significant testing burden for all manufacturers.

- c) DOE requests comments on referencing the updated ballast characteristics for these lamps [59 W 96-inch T8, Single Pin Instant Start lamp and 86 W, 96-inch T8] and whether these changes impact measured lamp efficacy. NEMA Comment: Under the 2009 test procedure rule, the 59W/96T8/IS (ANSI Datasheet 1505) is to be tested at 60 Hz without cathode heat. Testing this lamp at high frequency will increase the apparent efficacy. The 86W/96T8/HO lamp is already tested at high frequency with no cathode heat. Therefore, updating the test procedure will have no effect on this lamp type. However, per our comments in item b above, we do not recommend updating to these new standards.
- d) DOE requests comments on referencing the updated version of IES LM-58, whether DOE should consider permitting use of the new array spectrometry method, and how measured values derived from that method compare with currently authorized test methods. NEMA Comment: We call the DOE's attention to the fact that an addendum for this standard has been published to correct errata. The DOE and its analysts should ensure they have correct/accurate versions for review. The IES is generally very thorough to ensure equivalent results when adding permitted testing procedures, for this reason NEMA supports the array spectrometry method as an option.
- e) DOE's initial review indicates that changes in IES LM-45-2015, compared to its 2009 version, include various clarification updates regarding the impact of lamp polarity on light output and

changes to certain tolerances (e.g., impedance limits for instruments). DOE requests comments on referencing the updated version of IES LM-45.

**NEMA Comment:** We are not aware of any potential issues from adopting the newer reference.

- f) DOE's initial review indicates that changes in IES LM-49-2012 compared to its 2001 version include clarifications regarding input voltage, voltage regulation, lamp handling, wiring, and recording failures; the addition of instrumentation voltage tolerances; and direction regarding the interval at which operation of lamps should be checked. DOE requests comments on referencing the updated version of IES LM-49 and whether these changes would impact measured lamp life.  
**NEMA Comment:** We are not aware of any potential issues from adopting the newer reference.
  
- g) DOE's initial review indicates IES LM-20-2013, compared to its 1994 version, includes the addition of new definitions (e.g., extraneous light, undirected light) and changes to existing definitions (e.g., beam axis, central cone, stray light). IES LM-20-2013 also includes updates regarding characteristics of photometers, lamp stabilization, intensity distribution determination, among other topics; and changes to certain tolerances (e.g., allowable reflectivity in the integrated sphere). DOE requests comments on referencing the updated version of IES LM-20.  
**NEMA Comment:** We are not aware of any potential issues from adopting the newer reference.

## NEMA Comments on DOE Questions/Issues:

### 1. Rated Voltage of Incandescent Lamps:

- a. DOE would like feedback on simplifying the test voltage requirements for incandescent lamps and aligning them, to the extent possible, with DOE test procedure requirements for other lamp types such as compact fluorescent lamps (CFLs) and integrated light-emitting-diodes (LED) lamps. Those test procedures require that CFLs and LED lamps be tested at the voltage marked on the lamp as the intended operating voltage and if no voltage is marked to test at 120 V; if multiple voltages are marked including 120 V to test at 120 V, and if multiple voltages are marked not including 120 V to test at the highest voltage. DOE requests comments on modifying the required test voltage for incandescent lamps.

NEMA Comment: We support simplifying the test voltage requirement for incandescent lamps when testing for efficacy standards. Making this change will have little practical impact on the products that meet the efficiency regulations. When testing incandescent lamps for efficacy, there is almost no efficiency change when testing 120 volt lamps at 120 volts, vs. testing 130 volt lamps at 130 volts. However, there is a significant reduction in efficiency when testing 130 volt lamps at 120 volts essentially testing the lamp while it is operated in a dimmed mode. The “testing 130 volt lamps at 120-volt” requirement, which NEMA has opposed in the past, has eliminated regulated 130 volt lamps from the market.

### 2. Photometric Measurements:

- a. To the extent possible DOE would like to harmonize its test procedures for taking photometric measurements for lamps. For example, DOE test procedures for CFLs and integrated LED lamps prescribe the use of an integrating sphere method and disallow the use of goniophotometer. DOE requests comments on allowing only the integrating sphere method and not the goniophotometer method for testing of GSFLs, GSILs, and IRLs, particularly comments regarding accuracy and test burden.

NEMA Comment: We prefer to keep goniometer test methods as an option, since it is a better method for testing IRLs, particularly if one’s integrating sphere is busy.

- b. DOE requests comments on how frequently industry uses the average intensity distribution curve method to take total lumen output measurements for IRLs.

NEMA Comment: This method is little-used, but we support maintaining it as an option.

- c. DOE requests feedback on how frequently industry uses the peak lumen method to take measurements for GSFLs.

NEMA Comment: The peak lumen method is used with lamp types that may have a long stabilization time, such as High Output lamps. These are not high volume lamps and thus the method is not used often. However, it does improve throughput time in the laboratory and thus industry requests that it remain an option.

### 3. Other Test Procedure Topics

- a. DOE particularly seeks information that would improve the repeatability, reproducibility, and consumer representativeness of the test procedures.

NEMA Comment: Following ANSI Standards and IES test procedures produces state-of-the-art testing results. However, even when using state-of-the-art testing procedures testing variations occur and must be recognized. As such, the lighting industry continues to require acceptable measurement and laboratory tolerances when

considering compliance with efficiency standards. The NEMA LSD-63 standard<sup>1</sup> provides industry standardized testing tolerances that should be referenced by the DOE.

- b. DOE also requests information that would help DOE create procedures that would limit manufacturer test burden through streamlining or simplifying testing requirements.

NEMA Comment: As previously noted, adopting references without modification will reduce testing burden.

DOE currently requires annual sampling, testing, and reporting of GSFL and IRL models, among others. It would significantly streamline and simplify manufacturer test burden if this requirement was eliminated, and products reported to CCMS when introduced to or removed from the market.

- c. Comments regarding the repeatability and reproducibility are also welcome.

NEMA Comment: Life testing on reference ballasts for CFL plug in lamps should not be required.

- d. DOE also requests feedback on any potential amendments to the existing test procedures that could be considered to address impacts on manufacturers, including small businesses.

NEMA Comment: While we appreciate the consideration, it is our position that DOE should adopt consensus standards “without modification”.

- e. Regarding the Federal test method, DOE seeks comment on the degree to which the DOE test procedures should consider and be harmonized with the most recent relevant industry standards for GSFLs, GSILs, and IRLs, and whether there are any changes to the Federal test methods that would provide additional benefits to the public.

NEMA Comment: We have nothing to add to our previous comments in this document.

- f. DOE requests comment on whether the existing test procedures limit a manufacturer’s ability to provide additional features to consumers on GSFLs, GSILs, and IRLs. DOE particularly seeks information on how the test procedures could be amended to reduce the cost of new or additional features and make it more likely that such features are included on GSFLs, GSILs, and IRLs.

NEMA Comment: There is little to no innovation taking place with these products today. Modifying the test procedure will not change this. Furthermore, changes to the test procedures could increase, not decrease, testing burdens on manufacturers. The DOE should carefully consider burden in deciding whether to update these test procedures for highly mature products.

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<sup>1</sup> <http://www.nema.org/Standards/Pages/Measurement-Methods-and-Performance-Variation-for-Verification-Testing-of-General-Purpose-Lamps-and-Systems.aspx>