

DOCKETED

Docket Number:	15-AAER-06
Project Title:	Small Diameter Directional LED Lamps and General Purpose LED Lamps
TN #:	208932
Document Title:	Philips Lighting Comments on Title 20 - 15 Day language 1-22-16
Description:	N/A
Filer:	System
Organization:	Philips Lighting
Submitter Role:	Public
Submission Date:	1/22/2016 4:47:35 PM
Docketed Date:	1/22/2016

Comment Received From: Philips Lighting

Submitted On: 1/22/2016

Docket Number: 15-AAER-06

Philips Lighting Comments on Title 20 - 15 Day language 1-22-16

Additional submitted attachment is included below.



January 22, 2016

Submitted via e-filing

Mr. Andrew McAllister
Commissioner
California Energy Commission
1516 Ninth Street
Sacramento, California 95814

Docket No.: 15-AAER-6

**Comments on Title 20 – Revised 15 Day Language - Small Diameter Directional Lamps,
General Purpose LED Lamps, and Portable Luminaires**

Dear Commissioner McAllister,

Philips Lighting appreciates the opportunity to provide the attached comments on the revised 15-Day Language issued January 7, 2016 for Small Diameter Directional Lamps, General Purpose LED Lamps, and Portable Luminaires. These comments are in addition to the comments we submitted on January 20, 2016.

Thank you for recognizing the comments from Industry and modifying the color requirements to reference ANSI C78.377-2015. We also appreciate that an additional year has been granted to comply with the Tier 1 requirements.

We note that many individuals have written to the Commission in favor of product with CRI 82 and an R1-R8 value of 72 or greater. These individuals appear to be unaware that lamps that meet these criteria are available. Philips offers at least one model in the California market that meets those criteria *right now*. It is very likely that any lamp which meets the California Voluntary Quality Specification will meet those criteria.



PHILIPS

We understand your desire to have LED lamps that are very similar in performance to the incandescent and halogen lamps that will be legislated out of the market due to the 45 lumen per watt minimum that takes effect on 1/1/2018. We respectfully disagree that incandescent-like performance should be the minimum requirement to sell LED lamps in the state. That's why the Voluntary Quality Specification exists. The citizens of California should be allowed to make their own decisions about what type of lamps they are able to buy with their money.

Our detailed proposal on the revised 15 Day language follows.

Sincerely,

A handwritten signature in black ink, appearing to read "D. Woodward", followed by a comma. The signature is written in a cursive style.

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Comments on Title 20 – Revised 15 Day Language (1/7/16)

Small Diameter Directional Lamps, General Purpose LED Lamps, and Portable Luminaires

January 22, 2016

Philips Lighting appreciates the opportunity afforded by the Energy Commission to submit written comments on the revised 15 Day language for small diameter directional lamps, general purpose LED lamps, and portable luminaires.

We greatly appreciate that the Commission has responded to some comments from Industry and changed the color requirements to reference ANSI C78-377-2015. We acknowledge and appreciate the change in the 15 Day language that grants an additional year before the Tier 1 requirements take effect. The Commission appears to have decided not to address the majority of the comments related to general purpose LED lamps. Thus, the main points of our 45 Day comments are still valid.

The 15 Day language will:

- Penalize California consumers financially. They will have no choice but to buy more expensive and less efficient bulbs than consumers in the rest of the country.
- Reduce the availability of LED lamps in California, depending on the product type.

The first point is a matter of public policy, i.e., should California force consumers to pay more for a less efficient product, and should be at the front of the discussion.

The 2015 staff report predicts that in 2029, the projected energy savings will be 859 GWh/yr for general service LED lamps.¹ These savings are based on a less efficient CRI 90 lamp. What the report does not address, and what many observers do not realize, is that the savings could be greater if the Commission allowed the more efficient CRI 80 lamps into the regulation. CRI 90 lamps would still be available as part of the California Voluntary Quality Specification.

¹ California Energy Commission, *Analysis of Small-Diameter Directional Lamp and General Service Light-Emitting Diode (LED) Lamp Efficiency Opportunities*, October 2015. CEC-400-2015-034, Table 17, page 78.

Excluding the changes already incorporated by the Commission, our 45 Day comments stand. Our detailed comments follow and focus on the following:

- Color
- Connected Lighting and Standby Power
- Efficacy and Decorative models
- SDDL Availability
- Emergency Egress Applications
- Data Transparency

Philips Lighting, as a member of NEMA, supports and echoes their comments.

DETAILED COMMENTS

Light Source Color

As we and others such as NEMA and Lumileds pointed out in the comments on the 45 Day language, there is an underlying fallacy that the required minimum color score of 72 for the individual color indices of R1 to R8 can be achieved at the minimum required CRI of 82.

As we have previously shown, at CCTs of 2700-3000K, lamps with R1 to R8 greater than or equal to 72 have CRIs greater than 85. Thus, with this language, the Commission is effectively mandating product with a CRI of 90.

In the Supplemental Staff Analysis for General Service Light-Emitting Diodes, the Commission indicates that "...the total estimated cost of compliance for medium screw-base LEDs is \$0.50, compared with over \$7.00 in estimated energy savings."² We wish to point out consumers are very sensitive to first cost,³ not the savings over time, thus adding \$0.50 to the price of a lamp is significant.

In order to allow more efficient and cost effective LED products to continue to be sold in California, we would like to propose that the minimum CRI be reduced from 82 to 80. While there are products in the market at 82 CRI, this is because the manufacturer must target this level to ensure that the minimum is 80. If the minimum target becomes 82, then the design target becomes 85-86. There are few, if any, chip manufacturers that deliberately make LEDs with a CRI of 85, thus 90 CRI becomes the next level.

² Docket 15-AAER-06, California Energy Commission, Memo to the docket. Supplemental Staff Analysis for General Service Light-Emitting Diodes (LEDs), December 23, 2015. http://docketpublic.energy.ca.gov/PublicDocuments/15-AAER-06/TN207130_20151228T085859_Supplemental_Staff_Analysis_for_General_Service_LightEmitting_D.pdf

³ Craigo-Snell and Mertz, *ENERGY STAR Lamps v.2.0 DRAFT 3 (+ Interim Proposal) Specification Comments*, November 23, 2015, https://www.energystar.gov/sites/default/files/singlesite_uploads/CLEAResult%20Comments_0.pdf, page 5.

If our proposal for an 80 CRI minimum is adopted, this will allow more efficient and cost effective products to be sold in California. This also means that California consumers will have access to the same less expensive and higher performing products as the rest of the country. Most importantly, it will better allow the CEC to address the energy conservation needs of California.

Concurrent with a change in CRI from 82 to 80, we propose that the minimum requirement for R1 to R8 be removed completely, allowing greater flexibility in LED design. If removing the minimum R1 to R8 requirement is unacceptable to the Commission, then we suggest that the requirement on R8 alone be changed to a minimum of 55.

In parallel with, and tied to a change in the minimum CRI, we recommend that the minimum efficacy increase from 68 LPW in the 15 Day language to 70 LPW. This is for omnidirectional lamps only. We continue to recommend a lower limit for decorative lamps.

Also, whether the CRI requirement is ultimately changed or not, the Commission needs to clarify whether the limit is an individual minimum, i.e., no lamp can be below this value, or whether the average of a given sample must meet the minimum. As written, the language indicates that state regulated LED lamps shall have a CRI(Ra) of 82 or greater. Given that proposed DOE test procedure talks about averaging samples, the intent of the Commission is not clear in this regard.

Connected Lighting

A. Standby Power

We acknowledge that a very limited number of connected lamps with a standby power of 0.2W are currently available in the market. Energy Star is enacting a limit of 0.5W in their recently released Lamps v2.0 specification, and we (along with NEMA) advocated a limit of 1.0W in our 45 Day comments.

The proper limit for standby power depends on the ultimate intent of those setting the limit. For maximum energy savings, no standby power should be allowed – for any appliance. Consumers want products with features, however, and the market for connected lamps is in its infancy. Some would argue that this is the perfect moment to set limits, right before the market takes off. If the Commission’s intent is to limit innovation and the choices consumers have, then now is the time to set the limit. It would almost be like deciding what career your infant child would have before he or she even begins to speak, however.

Take a limit of 0.2W for example. While it is technically feasible, lamps with this amount of standby power are typically a dimming only product and run one of a limited number of wireless operating protocols. Also, when the lamp is operating, the feature associated with the standby power may save additional energy such as when the lamp is dimmed.

So, while 0.2W may appear feasible, some of the unintended consequences are:

- Lamps are limited to dimming only (no color tuning or color changing)
- Only one of a few wireless protocols may be used. Protocols such as Zigbee and Thread, for example, will not meet 0.2W.
- Features such as embedded Bluetooth speakers, WiFi repeaters, etc., are not possible
- Features that could *save* energy, such as an integrated occupancy or daylight sensor, are not possible.

We note the staff report indicates that “...staff found feasibility white papers discussing connected standby power levels as low as 0.05 watt.”⁴ We checked the reference and found that the claim of 0.05W is for the power consumption of only the microprocessor in the standby power circuit. It does not represent the standby power of a complete lamp. Thus is it misleading to suggest that lamps can have a standby power of 0.05W in the future.

The Energy Star limit of 0.5W is more realistic and is what many connected lamps are targeting. Philips supports this limit for Title 20. Thus, before the Commission sets what some see as a perfect solution and others see as draconian limit on a technology in its infancy, we ask you to seriously consider raising the standby power requirement to 0.5W.

B. Efficacy

Connected lamps have inherently lower efficacy than their non-connected counterparts; some additional power is used for microprocessor control and other components used for communication. Tunable and color changing lamps have some lower efficacy LEDs (e.g. 2200K white LEDs or RGB LEDs), and require extra optics to mix the light from the different LED colors. The net result is efficacy about 10 LPW lower than a non-connected equivalent. Efficacy limits higher than 70 LPW for connected omnidirectional lamps will severely limit product options at this time. Thus we propose the following efficacy limits for connected omnidirectional lamps:

	Connected Products	
Effective Date	Minimum Efficacy	Minimum CRI
January 1, 2018	65	80
July 1, 2019	70	80

There are few non-omnidirectional connected lamps available at this time, thus it is difficult to make efficacy recommendations for those products now

⁴ Docket 15-AAER-06, California Energy Commission, 2015 Staff Report: Analysis of SDDL and General Service LED Lamp Efficiency Opportunities, October 16, 2015. http://docketpublic.energy.ca.gov/PublicDocuments/15-AAER-06/TN206387_20151016T152059_2015_Staff_Report_Analysis_of_SDDL_and_General_Service_LED_Lamp.pdf

Efficacy Requirements - Decorative Lamps

Decorative LED lamps, especially those which are dimmable are inherently less efficient than omnidirectional lamps and merit lower performance criteria.

In our comments on the 45 Day language, we provided an analysis that decorative lamps are inherently less efficient than omnidirectional product.

We offer the following analysis of the data from the Energy Star Certified Product List:

Comparison of Average Efficacies for Omnidirectional and Decorative Products
Energy Star Certified Product List – January 19, 2016

	Omnidirectional	Decorative	Difference
Average LPW	83.0	72.8	10.2
St Deviation	12.5	15.0	
# of Lamps	1849	873	

For this reason, decorative lamps merit slightly lower performance criteria to increase product availability. If not, the use of decorative halogen and CFL products will continue and reduce the potential energy savings for the state. We suggest that the efficacy requirements for decorative lamps be reduced by 10 LPW from their omnidirectional counterparts in Tier 1 and Tier 2. This could be achieved by a straightforward modification of the compliance equation/score.

SDDL Lamp Availability

In our comments on the 45 Day language, we indicated that future availability of omnidirectional, decorative and directional LED lamps will suffer as a result of the requirements and timing.

The 15 Day language grants additional time before the requirements become effective and thus mitigates the availability issue *slightly* for the omnidirectional and decorative lamps.

For directional lamps, however, the issue remains that unless the requirements in the 15 Day language are modified, 92% of the currently available small diameter directional LED lamps will not be available to California consumers.

Emergency Egress Applications and Small Diameter Directional Halogen Lamps

We believe this is a serious issue that was not addressed in the 45 Day language nor the 15 Day language.

We appreciate that the Commission narrowed the scope for SDDL lamps in the 15 Day language, but the issue with SDDL and emergency egress products remains.

Philips Lighting's Chloride brand manufactures emergency lighting units that use halogen MR lamps of various wattages to provide emergency egress illumination during a power failure. One such model uses a 6V, 5.5W halogen MR16 lamp follows at the end of our comments. While this particular lamp is now excluded from the rulemaking, lamps at other voltages are not.

The concern is that when these lamps need to be replaced in the future, they will not be available in California nor will a suitable and approved LED replacement exist.

Given the above issues, we ask that the Commission move to exclude halogen lamps used in life-safety equipment from the rulemaking. If they do not, halogen replacement lamps may not be available in California for this critical life safety application.

Data Transparency

Throughout the recent rulemaking process, it has been extremely difficult to verify some of the analysis claimed in the 45 Day language. For example, if an analysis is based data from the Energy Star Qualified Product List on June 1, 2015, it is almost impossible to go back in time and obtain that same dataset.

Thus we would suggest that any data files and other analyses referred to in the staff reports and elsewhere be docketed so others can review the data and understand how the conclusions were arrived at.

RECOMMENDATIONS

As indicated in our comments, we offer the following recommendations to the Commission.

Light Source Color – R1 to R8

Remove the minimum requirement of 72 on the individual color indices of R1 to R8.

There is no technical basis for including them as a requirement and they conflict with the minimum proposed CRI requirement.

If removing the minimum R1 to R8 requirement is unacceptable to the Commission, then we suggest that the requirement on R8 alone be changed to a minimum of 55. *This is a change from 50 which appeared in our comments to the 45 Day language.*

Light Source Color – CRI

Reduce the minimum CRI requirement from 82 to 80 for state regulated LED lamps.

This change will allow lamps designed to CRI 80 to meet the requirement, and align with common industry practice and the Energy Star program.

In parallel with, and tied to a change in the minimum CRI, we recommend that the minimum efficacy increase from 68 LPW in the 15 Day language to 70 LPW. This is for omnidirectional lamps only. We continue to recommend a lower limit for decorative lamps.

Standby Power – Connected Lamps

Philips supports and recommends a limit of 0.5W for standby power in Title 20. This is a practical limit for industry and much less restrictive than the proposed 0.2W.

Efficacy Limits - Connected Lamps

Connected lamps have inherently lower efficacy than their non-connected counterparts. Thus we propose that the efficacy limits for connected omnidirectional lamps be 10 LPW less than those of their non-connected counterparts.

Efficacy Limits - Decorative Lamps

As shown in our earlier comments, decorative lamps have an efficacy about 10 LPW lower than omnidirectional lamps. Thus we propose that the efficacy requirements for decorative lamps be reduced by 10 LPW from their omnidirectional counterparts in Tier 1 and Tier 2.

Small Diameter Directional Lamps – CRI

We repeat our request to set a minimum CRI of 80 for small diameter directional lamps. Currently there is no minimum requirement for these products and adding one will not reduce product availability.

Data Transparency

We suggest that the data files used in the analysis be docketed so that anyone can review the data and perform their own analysis on data the Commission uses to reach their conclusions.

END COMMENTS