PHILIPS

Ms. Taylor Jantz-Sell
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Environmental Protection Agency
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Washington, DC 20460

Philips Lighting Comments on Energy Star Luminaires V2.0

Date: 2015-1-30

Dear Ms. Jantz-Sell,

Philips Lighting appreciates the opportunity to provide the attached comments on the Energy Star Luminaires V2.0.

As you may know, Philips North America is headquartered in Andover, Massachusetts. The U.S. Philips companies are affiliates of the Netherlands-based Royal Philips N.V., a diversified health and well-being company, focused on improving people's lives through meaningful innovations. Our long history in North America began in 1933, and today, it is the company's largest single market in the world, with approximately 22,000 employees and operations at 55 major facilities in 25 states and across 3 Canadian provinces. Sales for the region in 2013 was more than $9.5 billion*, which accounts for more than 30% of Philips global revenue.

Philips is a diversified technology company, focused on improving people's lives through meaningful innovation in the areas of Healthcare, Consumer Lifestyle and Lighting. Innovation has been a cornerstone of the company's strategy for over 120 years, creating a strong and trusted Philips brand with market access all over the world. Philips is a leader in cardiac care, acute care and home healthcare,

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energy efficient lighting solutions and new lighting applications, as well as male shaving/grooming and oral healthcare. Philips lights 65% of the world's top airports, 30% of offices and hospitals and landmarks such as the Empire State Building, the Sydney Opera House, the New Year's Eve Times Square Ball and the Great Pyramids. Philips owns more than 64,000 patent rights, is one of the world's top-50 most valuable brands, one of the world's top-50 most innovative companies, and ranked as one of the Best Global Green Brands by Interbrand.

Please find our detailed comments below. We look forward to working with you further on this important effort. If you have any questions on these comments, please contact me.

Sincerely,

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Below are Philips' comments and recommendations regarding the development of the Energy Star Luminaires V2.0.

We are glad to see that Energy Star is allowing screw-base lamps in luminaires. Elimination of the GU24 base requirement makes sense. The concern that someone will replace an expensive LED lamp with an incandescent seems to be a remote concern –certainly not large enough to require a different base type and the accompanying multiplication of SKUs. The elimination of low efficacy incandescent lamps is happening anyway, making the concern even lower.

We appreciate the expansion to include color tunable luminaires. We appreciate the attempt to keep testing minimal for these products.

We appreciate the simplification of eliminating the "commercial" designation.

We are also submitting comments for the following:

- Standby Power
- ANSI nominal CCTs 2200 and 2500 Kelvin
- IES TM-21 Addendum A
- Downlight Efficacy

Standby Power

We see connected lighting as a whole new area for digital lighting. And although there is major efforts underway to reduce standby power, many protocols are not there yet. For the lighting industry, this is a relatively new technology and it may be premature to start restricting design options and reducing creativity. As a result, for the time being we suggest maintaining the existing 1W maximum for standby power.

ANSI nominal CCTs 2200 and 2500 Kelvin

We would like for Energy Star to include the new ANSI nominal CCTs 2200 and 2500 Kelvin as defined in the forthcoming ANSI/ANSLG C78.377-2015. We have received strong input from the market for these color temperatures and believe Energy Star will benefit from their inclusion.

IES TM-21 Addendum A

We would like to caution the EPA about the use of IES TM-21 Addendum A in its current version. The problem is it does not include preamble language informing the reader what exactly is intended to control: the original language with some additions, or if the Addendum is intended to replace the relevant portions of 2011 language. We understand that Dr. Cameron Miller at NIST, Chair of the IES Testing Procedures Committee, is personally working on this. It would be good for EPA to connect with Cameron.

Downlight Efficacy

Retrofits are often one high-reflectance cone barely recessed into the ceiling (or sometimes not recessed at all). This means the efficacy of the retrofit luminaire is not that different from the efficacy of the light engine itself.

In contrast, recessed downlight products made for new construction typically have many different cone options: Specular, Semi-specular, Wheat, White, Diffuse, Bronze, Pewter, Black, etc. Some manufacturers have more options than others. Some of these finishes are more efficient reflectors than others.

Secondly, the cones in new construction are typically deeper than the retrofit luminaires. This has the advantage of reducing glare from the luminaire in the room, increasing user comfort and satisfaction, but has the disadvantage of reducing efficacy.

Third, new construction offers typically a range of choices of both CRI and CCT.

As an example, consider the following fictitious data that are all using the same light engine:

50° Cutoff

	Black	Pewter	Diffuse	White	Semi-specular	Specular
90CRI 27K	20	26	33	36	38	39
80CRI 27K	24	32	41	45	47	49
80CRI 30K	27	35	45	50	52	53
80CRI 35K	27	36	46	51	53	55
80CRI 40K	28	37	47	52	54	56

65° Cutoff

	Black	Pewter	Diffuse	White	Semi-specular	Specular
90CRI 27K	23	30	37	40	41	42
80CRI 27K	29	37	47	50	51	52
80CRI 30K	31	41	51	55	56	57
80CRI 35K	32	42	53	57	58	58
80CRI 40K	33	43	54	58	59	60

85° Cutoff

	Black	Pewter	Diffuse	White	Semi-specular	Specular
90CRI 27K	41	44	47	48	49	49
80CRI 27K	50	55	58	60	61	61
80CRI 30K	55	60	64	66	66	66
80CRI 35K	57	62	66	68	68	68
80CRI 40K	58	64	67	70	70	70

For making a retrofit, let's say the manufacturer decides to make one product with one cone finish, one cone depth, one CCT, and one CRI (highlighted in pink). That one product is tested (circled in red) and qualified under Energy Star.

For making a new construction downlight, let's say the manufacturer decides that deep 50-deg cutoff is valued by certain customers. So the manufacture decides to produce a product that has 50-deg cutoff, and offers the six finish colors shown above. For the Energy Star submittal, the engineers look for the finish with the lowest efficacy that still meets the Energy Star limit of 42 lm/W (so that the company can claim Energy Star for as much of the product line as possible). They choose the product circled in green (45 lm/W), meaning everything highlighted in light green passes Energy Star. It means only 40% of the product line options are Energy Star certified, but some of the line is better than none.

Things to note about this example:

For products with lots of trim options, the efficacy submitted to Energy Star is always going to be at or close to the limit set. If the limit was set to 30 lm/W, the manufacturer would submit a different trim option (maybe Pewter at 32 lm/W), and thus qualify a larger range of the product offerings. If the efficacy was set higher (say 50 lm/W), then the manufacturer would be forced to submit a higher-reflectance trim (such as white 30K at 50 lm/W). The manufacturer wouldn't be able to claim Energy Star on the pewter cone, even though they may still offer it. Or, the manufacturer may choose to go with a shallower cone, forcing customers who want Energy Star to have to endure discomforting glare from the luminaire.

Just because the worst-case trim submitted to Energy Star is close to 42 lm/W (45 lm/W in this example circled in green), it doesn't mean the whole product line is at that worst-case efficacy. Sometimes a different set of CCT, CRI, cone finish, and cone depth can give you a much better efficacy.

It is important to note in this example the retrofit (at 70 lm/W) and the new construction downlight submitted (at 45 lm/W) could conceivably be using the same light engine. So the difference in efficacy is due to the lighting quality approach and the number of options offered. Furthermore, the amount of energy used in all cases is identical.

One solution would be to measure the output of the light engine itself (before adding the cone).