



November 29, 2011

Alex Baker  
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US Environmental Protection Agency  
Washington DC. 20460

Dear Mr. Baker:

TCP respects and values its relationship with the EPA and welcomes the opportunity to comment on the recent draft of the ENERGY STAR® Product Specification for Lamps Version 1.0.

### **Lamp Type**

Under Non-Standard Shape Omni-directional lamp shapes, we would like to ensure that the LED “snow cone” shape is included in this description. As it is written now it includes CFL lamp types only.

### **Product Qualification; Product Families**

We would argue that product families with different CCTs and Heat sinks should require testing on only one lamp type and require supporting data for the primary lamp. Please find attached documentation where a slight variation in the heat sink meant simply to show differentiation in the product look, does not alter the lamp performance.

If there is a slight variation in the LED heat sink look and appearance and the manufacturer can provide supporting data that similar performance on heat sinks are identical, separate testing should not be required. This should apply to CFLs as well. Full photometric life testing should be required on one model. Whereas 100 hour testing should be required for the model’s family members in order to achieve lumen output, start up, run up, etc. Life testing is the same for all models regardless of CCT.

CFL early qualification recommendations:

TCP recommends a 90% Lumen Maintenance requirement after 20% of life. For example, a 12,000 hour bulb can be listed at 2400 hours if lumen maintenance is 90% plus. This would allow the item to be listed in 4-5 months after initial production instead of 8-9 months, keeping in par with the LED early qualification timeline. Manufacturer would still be required to submit their 1000 hour and 40% report. If an item is 90%+ at 20% it's a virtual lock it will be 80% at 40% (if by chance it fails 40% it's delisted)

Under today's format, LEDs can achieve the ENERGY STAR much earlier than the CFL. This puts new technology CFLs at a disadvantage, especially with longer hour CFLs. This could help speed new technology CFLs to the market faster.



With today’s ENERGY STAR format, for a 12,000+ hour bulb the testing timeline is approximately one year before it reaches the 40% of life early qualification status. Plus take into consideration all of the following time taking measures:

Testing time ~ 245 days

New packaging, adding the logo the the package ~ 1 week

Production and getting inventory in~ 6 weeks

Product on distributor/retailer shelves~ 2 weeks

**Photometric Performance; Luminous Efficacy Requirements**

- CFL A lamp and globe shaped lamps average an LPW of 45 to 53 where the base down position is typically the lowest. The current specification does not take into consideration these lamp types for this technology. TCP recommends dividing the Lamp types even further than the 3 categories you currently have listed. Dimming CFLs inherently use more components, this in itself yields to a lower performing lamp. Recommended lamp type categories are the following:

	All Lamps LPW*	Dimming CFL LPW
Spiral	65-70	58
Omni Directional	55	50
Non Omni Directional	55	50
Directional	42	40
Decorative	40	33

\* All lamp types with the exception of Dimming CFLs

- In previous specs a +/- 3% tolerance was granted, will this be included in this specification?
- The greater than 9 units for a passing test are not worthwhile. 1 outlier would not pull the average down. TCP recommends greater than or equal to 8.

**Light Output Requirements**

- A passing test should be based solely on the average, no two lamps will meet the same light output
- The lumens claimed should be the average of both the base up and the base down; it should not be from the worst of the tested positions. If it is not position unique then it should be the average of all lamps tested.
- Recommend adding language that states the claimed lumens should be the average lumens of the tested Base Up and Base Down results at 100 hours +/- 100 lumens. This ensures the claimed



lumens are not exaggerated by the manufacturer as there is no visual difference in a 100 lumen change. But at the same time allows the manufacturer some leeway in claiming whole figures.

- TCP recommends breaking down the Light Output requirements that match the luminous efficacy requirements listed above. The LPW and Lumens specifications should match. Below is an example outline of the breakdown, not all information was included, this is just meant as a representation of how we would like to see the requirements broken down.

	All Lamps*	Dimming CFL at full power
Spiral	25w- minimum of 250	n/a
	40w- minimum of 450	n/a
	60w- minimum of 800	Minimum of 850
	75w- minimum of 1100	Minimum of 1000
	100w- minimum of 1600	Minimum of 1500
	125w- minimum of 2000	
	150w- minimum of 2550	
Omni (Globes, A Lamps, Torpedo)	40w- minimum of 450	
	60w- minimum of 800	Minimum of 850
Non Omni (Globes, A Lamps, Torpedo, etc)	40w- minimum of 450	
	60w- minimum of 800	Minimum of 850
Directional		
Decorative		

\*except dimming CFLs

**Correlated Color Temperature (CCT)**

4-step ANSI MacAdam Ellipse is very difficult in CFLs. TCP currently manufactures to a 4 step tolerance, with quality procedures in place the end result is a 7-step test result. In order to achieve a 4-step result we would have to design to a 2-step tolerance. This would raise the cost of CFL’s significantly. The color shift in a 7-step is not dramatic enough to move the specification to a 4-step, the consumer would see little benefit in this mandate.

4-step in LEDs is also dependent on the LED Company. There is too much variation with the phosphor to be that consistent.



### **Color Rendering**

Please find the attached test data comparing the R9 ranges. To be in compliance with a  $\geq 0$  R9, the cost of the CFL would rise significantly, lower the lumens and the LPW, therefore, TCP proposes to change the specification to all lamps except CFL or completely remove the criteria. TCP challenges the actual benefits to the consumer by adding these criteria to the specification.

### **Lumen Maintenance/ Reliability Requirements**

The EPA Luminaire ENERGY STAR requirements use LM80, TM21 and in-situ TMP data to project L70 life without 6,000 hours testing. This method would also allow the manufacturer to account for the different variations in heat sink and LED color temperature, utilizing these industry standards. This would accomplish two things; it would decrease the burden of cost to the manufacturer in testing all variations as well as having the ability to introduce these variations to market in a timely fashion. This will allow the adoption of LED products quicker. Based on our experience we feel there is very low risk utilizing the current Luminaire specification standards versus spending time and money in performing 3,000 and 6,000 hour testing.

LEDS have seen newer LEDS to market as soon as 6 months from the release of prior technology, TCP recommends removing the 6,000 hour testing requirement and utilizing the same requirement as the luminaire specification in order to help get the product to market faster by decreasing the overall testing time and costs.

TCP recommends that for all new products the 10,000 hour requirement be in effect. However, for CFLs already qualified at 8,000 hours, they should be grandfathered in. Testing existing lamps to 10,000 hours will take over a year per model.

TCP recommends a +/- 3% tolerance on all lumen maintenance data.

Currently a requirement for all lamps in the ETLT will prove extremely costly. More than 90% of all lamps are currently tested in the open racks. To convert to either option A or option B of the ETLT procedure, this would take enormous resources and expenses. This is also a tremendous burden on the manufacture in terms of time to market. This is impractical for SSL due to the life span of the new technology. This is impractical for CFL due to the harsh demands on the manufacturer for the cost of resources. TCP recommends maintaining the requirement for directional lamps only.

### **Rapid Cycle Stress Test**

TCP recommends altering the spec to say for All lamps greater than 10 watts and breaking up the spec between CFLs and LEDs. For LEDs, TCP recommends 2 minutes on and 2 minutes off because LEDs do not have the heat issue that CFLs do to require a longer on/off time, also due to a higher rated life of LEDs for test duration.



### **Luminous Intensity Distribution Requirements**

TCP is not convinced that the average consumer notices Omni-directional vs. non standard. However there is a considerable cost difference between the two designs.

### **Power Factor**

Please find the attached data showing the number of components a CFL designed to a .7 PF takes versus a CFL designed with a .5 PF takes when the benefit is not worthy of a total lamp redesign. TCP urges EPA to look at the benefit to the consumer or the utility of a .7 PF vs. a .5 PF before deciding any change. With this new requirement, the entire industry would have to go through a redesign and the length of time would take years.

### **Start Time**

Instant start lamps can be .5 second or less.

TCP recommends one second for Programmed Rapid Start lamps as the delay is minimal and the benefits outweigh the slight delay with a much longer life and can be used in frequent on/off cycle applications for greater energy savings.

### **Run Up Time**

TCP recommends reducing the levels of stabilized light output to one level only. There is no benefit to the three testing levels. This only adds more resources to the testing procedure and adds time to the testing life. TCP recommends 80% of stabilized light output in  $\leq 45$  seconds for all lamp types  $\leq 23$  watts.

For the covered compact fluorescent, TCP recommends adding the 80% of stabilized light output in  $\leq 90$  seconds.

### **Dimming Requirements**

1. All dimming products, the power factor should be  $\geq .7$ .
2. The dimming range should be down to 5% with flicker free. TCP recommends this be measured by the operational frequency. People cannot notice the flicker in a fluorescent that have a flicker rate of 120 cycles per second or 120Hz. Using this method along each point of the dimming curve will help ensure no flicker.
3. Low end starting capability should be  $\geq 10\%$  of light output.
4. For dimming measurability TCP recommends using the attached dimming curve with a variance of  $\pm 15\%$ .
5. Life should be 10,000 hours minimum.



### **Color Spectrum / Nominal Color**

FTC lighting Facts label requires a color spectrum already. It is not necessary to add a second ENERGY STAR spectrum. Incandescent would also need to be pointed out where it falls in the spectrum.

The naming convention you have listed is not what is widely known. Look at the big box stores and what the consumers are largely used to buying. This specification is supposed to aid the consumer in buying decisions, do not change what they have already come to know in this confusing time in lighting.

Soft White = 2700K

Warm White = 3000K

Bright White = 3500K

Cool White = 4100K

Daylight = 5000K

Thank you for the opportunity to submit comments. If you have questions or would like to discuss further, I can be reached at [MObradovic@tcp.com](mailto:MObradovic@tcp.com) or at 330-995-1034.

Sincerely,

Melissa Obradovic

Product Manager