

MaxLite Response to the ENERGY STAR CFL Criteria Revision Proposal

Efficacy

<u>Draft Revision Criteria 8/30/05:</u>		<u>MaxLite Suggestion</u>	
<u>Lamp Power (Watts) & Configuration</u>	<u>Minimum Efficacy: Lumens/watt</u>	<u>Lamp Power (Watts) & Configuration</u>	<u>Minimum Efficacy: Lumens/watt</u>
<u>Bare lamp:</u>		<u>Bare lamp:</u>	
<u>Lamp power < 15</u>	<u>60.0</u>	<u>Lamp power < 10</u>	<u>50.0</u>
<u>15 < Lamp power < 25</u>	<u>65.0</u>	<u>10 < Lamp power < 15</u>	<u>60.0</u>
<u>Lamp power > 25</u>	<u>70.0</u>	<u>15 < Lamp power < 25</u>	<u>65.0</u>
<u>Covered lamp:</u>		<u>Covered lamp:</u>	
<u>Lamp power < 15</u>	<u>50.0</u>	<u>Lamp power < 15</u>	<u>50.0</u>
<u>15 < Lamp power < 25</u>	<u>55.0</u>	<u>15 < Lamp power < 25</u>	<u>55.0</u>
<u>Lamp power > 25</u>	<u>60.0</u>	<u>Lamp power > 25</u>	<u>60.0</u>

MaxLite agrees that the new proposed efficacy levels are a natural and necessary next step for our industry. Our concerns are with lamp power less than 9 watts in the spiral shape.

Reason:

Because of the relatively short tube length lamp, voltage is lower therefore CRI will suffer. We can change the gas ratio to meet the 100 hour test point but the 1000 & 40% hour test points will be very difficult to meet consistently in the manufacturing process. We propose an additional layer in the spec for < 10 watts with a minimum efficacy of 50.

The “U type” CFL will have an advantage and is better suited to meet the proposed criteria but the shape and overall MOL is generally not accepted in the market.

COLOR RENDERING INDEX (CRI):

8/30/05 Draft Text:

LUMEN MAINTENANCE AT 100 Hours:

Average of the 10 samples tested must be greater than 80.0, and no more than 2 individual samples can have a CRI less than 77.0.

1,000-HOUR LUMEN MAINTENANCE:

Average lumen output measurement of the 10 lamps tested must be greater than 90.0% of initial (100-hour) lumen output @ 1,000 hours of rated life, and no more than 2 individual samples can have a lumen output measurement less than 85.0%.

LUMEN MAINTENANCE AT 40% OF RATED LIFE:

Average of the 10 samples tested must be greater than 80.0% of initial (100-hour) rating at 40% of model’s rated life (Per ANSI C78.5, Clause 4.10), and no more than 2 individual samples can have a lumen output less than 75.0%.

MaxLite agrees with this proposed change in the specification testing results for 100 hours and for 1000 hours. However for the 40% rated life the current proposal requires no more than 2 individual samples can have a lumen output less than 75%. This can be achieved by using only the highest quality spiral burners available. Even then, our testing of the leading burners available in China yielded an

average 3 at less than 75%. MaxLite suggests no more than 3 individual samples can have a lumen output less than 75.0%.

Reason;

There are two main points in the manufacturing process concerning CRI. First is in the mixing ration of the phosphors and the second is in inserting the inert gas to the tube. Current manufacturing techniques and tolerances really cannot meet this spec on a mass production basis. Only in very tightly controlled laboratory environment can this be met. If the spec remains at no more than 2 individual samples can have a lumen output less than 75.0%, costs can be increased by as much as 20%.

CORRELATED COLOR TEMPERATURE:

Manufacturer must identify one of the following designated correlated color temperatures to market their product as: 2700K, 3000K, 3500K, 4100K, 5000K, or 6500K, and at least 9 out of the 10 samples tested must fall within a 7-step ANSI Mac Adam ellipse for that color temperature at the 100-hour lumen measurement.

This area of the proposal concerns MaxLite the most. We consider this a serious problem. Many factors can impact CCT in the manufacturing process. Phosphor defects, chemical deposits and impurities in the phosphor as well as the emitter on the filament and the filament itself. Mercury purity can have a major impact as well. Even with very tight controls in laboratory conditions our engineers yielded the following average results (twenty samples measured at 0, 100, 1000 and 4000 hours;

	X	Y
0	0.456	0.413
100	0.461	0.412
1000	0.469	0.41
4000	0.479	0.405

Other smaller experiments yielded even wider results. We feel this spec is unreasonable for mass production. Although very difficult we feel the spec can be met for about 3000K but the further from 3000K we target the wider the results. We propose a wider tolerance or at least a widening tolerance scale as the target color moves further from 3000K. We propose the spec not be measured only on the Mac Adam ellipse but the Mac Adam ellipse be used a center point and a new spec be based on the average X & Y coordinates over time. The coordinates should be wider for 2700K & 3500K then for 3000K, wider still for 4100K, even wider for 5000K and so on.

Another suggestion we would make is to allow more color options. The six colors mentioned are the most popular currently but the market often require other colors, 6000K most notably.

RUN-UP TIME – BARE PRODUCTS ONLY:

Average of 10 samples tested must be less than 1.0 minute per ANSI C78.5, clause 3.11 and 4.8.

MaxLite agrees that this proposed run-up time spec can address concerns from consumers and this is important for our industry. However this spec limits construction of the burner to those made with secondary or auxiliary amalgam to ensure consistent run-up time. Even using this construction method and very tight controls our engineers feel an average 2.1 minutes is reasonable based on current technologies and manufacturing processes.

Reflector CFL Requirements:

INITIAL ELEVATED TEMPERATURE LIGHT OUTPUT:

Product will meet the minimum requirement of maintaining 90.0% of initial rated light output when operated in an 8” (nominal) deep ICAT down light installed in the UL 1598 thermal test apparatus for IC-rated luminaries.

ELEVATED TEMPERATURE 1,000-HOUR LUMEN MAINTENANCE:

Average lumen output measurement of the 10 lamps tested must be greater than 90.0% of initial (100-hour) lumen output @ 1,000 hours of life, and no more than 2 individual samples can have a lumen output measurement less than 85.0%.

Samples must be tested at 55°C ± 5°C in the Elevated Temperature Test apparatus.

ELEVATED TEMPERATURE LUMEN MAINTENANCE @ 40% of RATED LIFE:

Average of the 10 samples tested must be greater than 80.0% of initial (100-hour) rating at 40% of model’s rated life (Per ANSI C78.5, Clause 4.10), and no more than 2 individual samples can have a lumen output less than 75.0%.

Samples must be tested at 55°C ± 5°C in the Elevated Temperature Test apparatus.

MaxLite agrees with this proposed change in the specification testing results for initial testing and for 1000 hour lumen maintenance. However for the 40% rated life proposed spec of no more the 2 units have a lumen output of less then 75% is unreasonable based on current technologies and production methods. We suggest no more then 3 can have an output of 70%. We also suggest a change to the life hour category to include reflectors with a minimum life of 4000 hours. At 4000 hours the consumer would still enjoy huge energy savings over the bulb life time. Also, by adding a life hour category of 4000 hours the market would still have a wide range of ES rated reflector products to choose from, the proposed spec as is will only allow for a very limited number of reflector lamps that can meet the proposed spec.

We also have concerns about the overall spec for reflector type lamps as the proposed spec assume all reflector lamps are used in recessed cans. In fact many reflector lamps are used outdoors. In an outdoor environment manufacturers are concerned more with cold weather conditions then with high temperature applications. The construction of “R type” CFL’s are very different for these two applications. MaxLite suggests that for reflector type CFL’s designed and marketed for outdoor use remain the same as current criteria.

PROGRAM COMMITTEES:

Product Selection Committee:

- **Oversee the final product selection process for each testing cycle.**
- **Comprised of four representatives – one member from industry (equipment manufacturers, testing organizations or laboratories), two members from a lighting stakeholder group or utility, and DOE. Third Party Testing Administrator will assist the committee.**

Technical & Research Committee:

- **Responsibilities include identifying product test procedures to incorporate into the program, evaluating testing uncertainties and data anomalies, testing tolerance levels, and developing management protocols to address these topics.**
- **Comprised of six representatives - will consist of a balanced representation from industry (equipment manufacturers, retailers, and testing laboratories) and lighting stakeholder groups.**

MaxLite offers to assign qualified personnel to join the Product Selection and or Technical & Research committee’s to represent an equipment manufactures prospective.