Email received on June 21, 2010 from Bill Ott.

Energy Star,

Attached is an Excel file that includes comments from HeathCo LLC regarding the First Draft of the Luminaire Energy Star Program Requirements.

Thanks,
Bill Ott
Vice President Engineering

HeathCo LLC

Page	Section	Parameter	Source/Luminaire Type	Current Proposal	Recommended Change	Reason for Change
1	Scope of This Specification	Directional and Non-Directional applications.	All	Luminaire types are categorized as either Directional or Non-Directional.	Do not define luminaire types into Directional or Non-Directional applications and rely on the definition of Direct Lighting and the LM-79 test data.	Since a definition of Directional Luminaires and Direct Lighting is included on Page 4 categorization of Luminaire types into these applications is not necessary in this section. Let the data from LM-79 testing drive the category. For instance we have developed an outdoor security luminaire that has 95% of the light directed at the surface to be illuminated and in this section it is categorized as Non-Directional, however, based on the definition it is considered Directional.
10	Photometric Performance Requirements	Source Efficacy: Non-Directional Luminaires	Solid State: LED Light Engine	≥70 LPW per LED light engine	≥40 LPW per LED light engine	Based on the definition of "Light Engine" the validation of this parameter would have to be done with the optics installed. Since LEDs are very directional a diffusing optics design is required to achieve a non-directional effect as desired with outdoor porch lights. These types of optics are very inefficient and in combination with the output loss of the LED in steady state conditions and efficiency of the power supply a specification of 40 LPW is realistic using current high-output LEDs and robust switcher power supplies. 1 - LED Light Engine testing based on ASSIST's proposed method would require a complete additional level of photometric tested based on a test jig custom designed for each unique LED/driver/circuit board application. This would result in an unjustified addition of time and investment. 2 - Since it is worthy to require light output efficiency, our recommendation it to test total flux output with the decorative optical covers (globes, glass panels, diffusers, etc.) removed. In this configuration, a 70 LPW requirement is justified.

10	Photometric Performance Requirements	Minimum Light Output: Non-Directional Luminaires	Solid State: LED Light Engine	850 lumens	500 lumens	The typical light source utilized within outdoor porch lights are 60 W incandescent lamps. Measured with no shielding they put out around 800 lumens. However, since the light pattern of an incandescent lamp is essentially spherical much of the lumen generation is above horizontal and not useful light within an outdoor porch light. In contrast, most of the lumens generated by non-directional LED lighting is below horizontal so putting a minimum requirement for solid state light engines equivalant to the total light output of an incandescent lamp is excessive. This will yield a luminaire that has higher lumen output than the end user wants and increases the cost that will limit solid state adoption. Changing the requirement to roughly 70% of the total lumen output of a 60 W lamp will result in an equivalant usable lumens from a solid state light engine. Referencing ASSIST's luminaire definition: "Functional luminaires are designed to illuminate the space to a sufficient light level....." Whereas "Decorative luminaires...do not always add significant ambient illumina
11	Photometric Performance Requirements	Energy Star requirements - Automatic shut-off	Halogen Incandescent (outdoor only)	Automatic shut-off after 15 minutes.	Allow motion sensor to be overridden provided that it resets to the automatic mode within 24 hours.	For residential luminaires allowing a manual override of the automatic shut-off mode is a desireable feature requested by our customers. In situations where the consumer is utilizing the light for long periods of time to have the unit shut-off every 15 minutes is inconvenient and annoying. We include the ability to temporarily override and if not customer reset will automatically go back to the automatic mode at dawn. This specification conflicts with that defined in the photosensor control section on page 24 that allows 24 hour reactivation when using manual override.

11	Photometric Performance Requirements	Energy Star requirements - Meets Off-State Power Consumption Requirements	Halogen Incandescent (outdoor only)	Off state power requirements of ½ watt	Off state power requirement of 1- ½ watts.	Outdoor Luminaires will be required to include an integrated photosensor that automatically detect day/night conditions to control power consumption as per the Photosensor Control requirements on page 24. Typical outdoor photosensor control devices currently in the market do not meet the 1/2 watt requirements and most utilize up to 1.5 watts when the luminaire is in the off state. This requirement must be higher until the technology is available to meet the current proposal.
13	Photometric Performance Requirements	Energy Star Requirements - Luminaire Efficacy	Outdoor Post or Arm Mounted Decorative Luminaires	35 LPW	25 LPW	Outdoor Post or Arm Mounted Decorative Luminaires are designed to provide an aestetic addition to the outside architecture of a home in addition to provided a useful light source. In providing the architectural elements demanded by our customers the usage of light globe is still being demanded even though it is functionally not required with solid state lighting technology. These globes leverage decorative elements like cross bracing, art and frosted glass and other decorative elements. All of the architectural details will block or filter the usable light emitting from the solid state devices and severely impact luminaire efficacy. Existing product testing with state-of-the-art LED light engines only achieved 25 LPW due to this impact thus prompting the recommended change. Since it is worthy to require light output efficiency, our recommendation it to test total flux output with the decorative optical covers (globes, glass panels, diffusers, etc.) removed. In this configuration, a 35 LPW requirement is justified.

13	Photometric Performance Requirements	Energy Star Requirements - Luminaire Efficacy	Inseperable luminaire (Solid State Lighting)	70 LPW	35 LPW	Most luminaires purchased at retail are purchased as a retrofit and installed by a Do-it-Yourselfer (DIY). The DIY has limited technical knowledge and would not be comfortable or qualified to perform a retrofit or upgrade upon product failure. They would most likely replace the complete luminaire with a new model. In addition, the initial failure mechanism on these types of luminaires will be the finishes and the coatings and with these types of failures a total unit replacement is required. These products also have an aestetic element and are replaced in many cases prior to product failure to upgrade the styling for improved curb appeal. Therefore, the need for seperable designs is really needed in the commercial market but not in the retail channels and therefore imposing a luminaire efficacy of 70 LPW would severly stall the propogation of solid state technology to the masses. A luminaire efficacy of 35 LPW is feasible (but challenging) with today's technology, will still require high quality LEDs but enable a price point that can be offered at retail.
17	Photometric Performance Requirements	Energy Star Requirements - Lumen Maintenance Requirements: Directional and Non-Directional Luminaires	Solid State Option 1: Component Performance	Utilize LED LM-80 Test Report and Luminaire LM-79 Test Report	No Change	The option of utilizing the LM-80 must be maintained. It provides the best indication of expected lumen depreciation to satisfy the needs for quantfying this parameter. Aging of the power supply components will not result in a drop in driver output and subsequent lumen depreciation. Also, requiring the luminaire supplier to run a test that lasts 6,000 will severely impact the ability to get the product to market and meet the needs of the business or customer.

27	Photometric Performance Requirements	Energy Star requirements - Off-State Power Consumption Requirements: Directional and Non-Directional Luminaires	All Source Types	Off state power requirements of ½ watt	Off state power requirement of 1- ½ watts.	Outdoor Luminaires will be required to include an integrated photosensor that automatically detect day/night conditions to control power consumption as per the Photosensor Control requirements on page 24. Typical outdoor photosensor control devices currently in the market to not meet the 1/2 watt requirements and most utilize up to 1.5 watts when the luminaire is in the off state. This requirement must be higher until the technology is available to meet the current proposal.
28	Photometric Performance Requirements	Energy Star requirements - Operational Frequency: Directional and Non-Directional Luminaires	Solid State	≥ 120 Hz	Output content < 120 Hz is <8% of average	Switcher power supplies are utilized extensively for power high quality solid state lighting based luminaires. Most have operational frequency outputs of greater than 50kHz, however, there will always be some remnants of the original 60Hz AC frequency on the signature. To avoid the confusion we have seen in labs measureing this parameter it is recommended that we allow a small (<8%) percentage of the content to be below 120Hz to eliminate this measurement confusion since it will not have an impact on the visible flicker.

29	Photometric Performance Requirements	Energy Star requirements - Ballast/Driver Replaceability: Directional and Non-Directional Luminaires	Solid State	Ballast/driver must be accessible and replaceable without the cutting of any wires.	Outdoor Only - Not Applicable.	Most luminaires purchased at retail are purchased as a retrofit and installed by a Do-it-Yourselfer (DIY). The DIY has limited technical knowledge and would not be comfortable or qualified to perform a retrofit or upgrade upon product failure. They would most likely replace the complete luminaire with a new model. In addition, the initial failure mechanism on these types of luminaires will be the finishes and the coatings and with these types of failures a total unit replacement is required. These products also have an aestetic element and are replaced in many cases prior to product failure to upgrade the styling for improved curb appeal. Therefore, the need for seperable designs is really needed in the commercial market but not in the retail channels and therefore imposing requirement for replacability would severly stall the propogation of solid state technology to the masses. The requirement also conflicts with the criteria defined as a "Inseparable Luminaire" per the Solid State Luminaire Efficacy specification defined on page 13.
36	Photometric Performance Requirements	Energy Star requirements - Warranty Requriements: Directional and Non-Directional Luminaires	Solid State	3 Year Unconditional Warranty	3 Year Unconditional Warranty	Accepting of proposal as is.
36	Photometric Performance Requirements	Energy Star requirements - Warranty Requriements: Directional and Non-Directional Luminaires	All other outdoor Fixtures qualifying with either an Efficiant Light Source or Reduced Operating Time except Solid State based luminaires	2 or 3 Year Unconditional Warranty	2 Year Unconditional Warranty	The RLF, V4.2 - Annex A , Tables 2A and 2B outline the warranty requirements as 2 years for either Efficient light Source or Reduced Operating Time. We have Energy Star warranty documented on the product packaging and Installation Manuals for over 140 SKUs based on this standard. It would be time consuming and expensive to change these to the 3 year warranty as defined by this standard.