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Alex Baker
Lighting Program Manager, ENERGY STAR
Office of Air and Radiation
United Environmental Protection Agency
Washington, D.C. 20460

Via email and FEDEX

Dear Mr. Baker,

We are writing in response to your January 19, 2011 letter inviting comments to ENERGY STAR's proposed labeling requirements for Integral LED Lamps in the "Non-Standard Lamp" category.

Lemnis manufactures the popular Pharox 300 LED lamp, which is currently seeking qualification in ENERGY STAR's non-standard category. We have sold more than 3 million Pharox lamps to date. Lemnis wholeheartedly endorses ENERGY STAR's goal of enacting labeling requirements to enhance consumer understanding of lamp quality and suitable applications. We are concerned, however, that the proposed icons depicted in attachment to your letter ("Proposed Icons") will fail to assist consumers and, in fact, will undermine ENERGY STAR's stated objectives. The Proposed Icons are confusingly drawn, do not communicate the intended message, and will be inconsistently applied due to reliance on subjective criteria. Similarly, the requirement that a "NON STANDARD LAMP" warning be stamped on the front of every box serves no communicative purpose other than misleading consumers into thinking the lamp will not fit into medium base screw fixtures. The reality is Lemnis has yet to receive a complaint from a customer who was unable to fit our Pharox 300 into a medium base screw fixture.

Lemnis proposes ENERGY STAR adopt two alternative icons, shown below ("Alternative Icons"). The Alternative Icons directly communicate the physical shape and light distribution characteristics that ENERGY STAR is concerned about.



They are superior to the Proposed Icons because: they clearly communicate the relevant limitations; they are based on objective data rather than unsupported speculations about how customers use fixtures; and they can guide consumers purchasing lights for any intended application, not just the six arbitrarily chosen fixtures covered in the Proposed Icons. If these Alternative Icons are adopted, then the NON STANDARD LAMP warning is obviated as redundant because the icons communicate the same information with more clarity and precision.

A. ENERGY STAR's Commendable Objectives. ENERGY STAR is concerned about "lamps exhibiting standard shape not meeting photometric performance requirements established for those shapes," leading to consumer disappointment. Specifically, ENERGY STAR is concerned about non-standard physical shapes failing to work with traditional fixtures, as well as, failing to meet the light distribution of standard lamps. As a result, ENERGY STAR is enacting a labeling requirement to help consumers determine which non-standard lamps are "efficient, quality products." ENERGY STAR's goals for the labeling program are to: (1) minimize confusion, (2) provide consistent messaging, (3) ensure consumer understand each lamp's "appropriate application" and "limitations."

B. The Proposed Icons Undermine ENERGY STAR Goals. The Proposed Icons are, quite frankly, hard to understand and based on unclear criteria. Moreover, they attempt to communicate lighting performance information by making blanket warnings against six limited "applications." The problems with the Proposed Icons include:

1. **The Icons appear to be safety icons.** For instance, the icon in your example appears to say LED lamps are not safe in table fixtures. This could unfairly scare consumers away from LEDs in general.

2. **The drawings are confusing.** For example, Pendant 1 icon and Pendant 2 icon (indicating different light distributions) seem almost identical. The average consumer will not understand this icon is referring to light distribution. As a result, the consumer is likely to ignore or misinterpret the icon. In addition, the icons are highly imprecise: they seem to divide into 90, 180, and 300 degree light distributions, while ignoring the many nuances in between.

3. **The Proposed Icons' implied warnings are too broad.** For example, a directional LED lamp in a table fixture may not meet the requirements for downlighting task, yet it may excel as an accent light. You have presented no evidence whatsoever that consumers would correctly infer from the label that it refers to a downlighting limitation. It may also excel as a directional lamp in a reading light or floor fixture. The six proposed icons do not fairly communicate these many suitable applications. The customer is left to assume if the lamp is not appropriate, or worse, "not safe" for a table fixture, it is also not safe in all other types of portable household fixtures, whether their intended use is directional or omni-directional.

4. **The icons are based on subjective criteria leading to inconsistent messaging.** The criteria for selecting the Proposed Icons is nebulous and subjective. The proposed instructions say: "those applications for which the lamp's luminous intensity distribution would fail to meet *the requirements of a given task* shall be marked with an 'X'."

Any fixture, such as a table fixture, may be used for many "given tasks." This leaves it to manufacturers to subjectively decide which tasks apply to each icon. Inevitably manufacturers will pick different criteria, meaning the icons will be inconsistently applied.

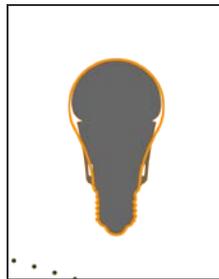
In essence, the Proposed Icons do not convey the two messages ENERGY STAR is concerned about. ENERGY STAR aims to convey that non-standard lamps (1) vary in physical shape from ANSI standards, and (2) vary in light distribution. The only acceptable approach in our opinion is hence to craft icons that speak directly to the physical shape and light distribution characteristics at issue.

C. **Better Approach Is To Use Icons That Directly Communicate The Attributes At Issue.**

Lemnis recommends ENERGY STAR adopt the Alternative Icons shown below, or similar icons, that directly communicate the physical shape and light distribution characteristics. The icons are based on clear, objective, universally applicable criteria about lamp characteristics, rather than subjective judgments about "application" suitability. These icons will better assist consumers to properly select the right lamp for their own intended use.

1. **The Shape Icon Communicates Non-Standard Shape Limitations**

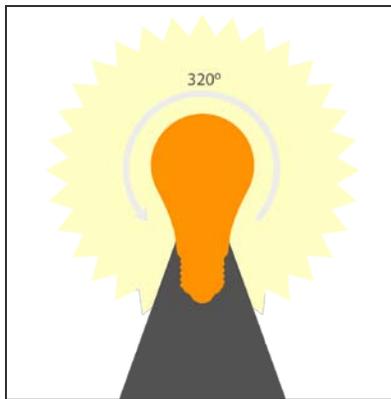
ENERGY STAR is concerned that some non-standard lamps do not meet all of ANSI physical shape requirements. Rather than making a blanket ruling about the suitability of a physical shape via the warning "NON-STANDARD", we propose showing the consumer the actual physical shape variation. Lemnis proposes conveying this physical shape limitation by using an icon that overlays an outline of standard ANSI measurements on top of a profile of the non-standard lamp being sold. This simple icon will clearly communicate the precise shape variations. Consumers can then use this simple diagram to determine if the lamp will fit into their specific fixture.



The proposed shape icon above satisfies each of ENERGY STAR's labeling objectives. First, the icon will minimize confusion by directly communicating the nature and degree of the physical shape deviation. Second, the shape icon will insure consistent messaging because it is based on objective data about the physical shape of the manufacturer's lamp, rather than a simple warning "NON-STANDARD" which carries no informational content useful to consumers. This will also simplify ENERGY STAR's job when assessing labeling compliance. Finally, the shape icon enhances consumer understanding by clearly communicating the precise shape variations. In fact, the shape icon will help consumers make informed decision about lamp suitability for all potential fixtures.

2. The Light Distribution Icon Directly Depicts Light Distribution Characteristics

ENERGY STAR is also concerned that consumers will be disappointed by non-standard lamp light distribution, yet it is incorrectly inferred that all consumers expect certain light distribution characteristics of all A-line bulbs. Rather than using the proposed fixture based icons with crude dashes to convey light distribution, Lemnis proposes using an icon that directly depicts each lamp's light distribution. An example of the proposed distribution icon is below:



The light distribution icon should be based on objective photometric data from standard IES LM-79-08 testing. We propose the icon be drawn as follows: Divide a 360° vertical cross section of a lamp into 5° zones. Use LM-79-08 zonal lumen data to distinguish between "light" and "dark" zones.¹ The "light" zones are highlighted yellow in the icon. The dark zones are highlighted gray in the icon. The result will look like the graphic above. Light zones could be defined as those receiving 50% or more of the average lumen output per zone, and dark zones those receiving less than 50%. The

average lumen output per zone would be the total lumen output of the lamp, divided by 72 (5 degree) zones.

The light distribution icon satisfies each of ENERGY STAR's labeling objectives. First, the icon clearly communicates the lamp's photometric's performance, without using confusing application assumptions as a proxy. Second, by using clear objective test data as the criteria for drawing the icon, manufacturers will have no choice but to convey light distribution data in a consistent manner. Third, the simple visual icon will enhance consumer understanding about each lamp's light distribution, instead of making unsupported assumptions about intended use of a particular fixture type. Consumers will be able to directly assess whether the lamp's light distribution is satisfactory for their intended use. They will also have an apples-to-apples way of comparing product options before purchase. Moreover, this icon will lead to enhanced consumer appreciation of LED lamps in all possible applications, not just the six fixture types covered by the current icons.

D. The "NON-STANDARD LAMP" Label Requirement Scares Consumers While Offering No Additional Guidance

There is no doubt most consumers will be wary of buying a lamp with "NON STANDARD LAMP" stamped in big capital letters on the front of the package. Yet, this stern warning offers no informational value to the consumer. In fact empirical data shows this scary warning will be unfairly misleading consumers who are not well versed in the technical nuances of the Energy LED Integral Lamp Specification.

The label "NON STANDARD LAMP" communicates no useful information to the consumer. The label mistakenly assumes a baseline STANDARD lamp is already commonly known. The average consumer would be forced to ask "Standard to what?", and will inevitably draw the wrong conclusion. Again, the better approach is not to scare the consumer but rather arm them with the information needed to draw their own conclusion. If the Alternative Icons above are used, then the consumer is already informed precisely about the lamp's physical shape and light distribution variations. Putting a scary warning on the front adds no additional information.

The common sense reality is that the average consumer will assume "NON STANDARD LAMP" means it will not work with typical medium screw base Fixtures. Lemnis can demonstrate such an assumption is factually incorrect with two simple data points. First, Lemnis has sold more than 3 million Pharox lamps without receiving a single complaint as to physical shape. Second, the Lemnis team tested whether the Pharox lamp fit in every floor and table fixture on display at both Home Depot and Lowes. The Lemnis lamp fit perfectly in all 67 fixtures at Home Depot and 42 fixtures at Lowes. As these are two of the largest consumer appliance vendors, it is safe to assume a major swath of American consumers will not be disappointed by the physical shape of Lemnis and other NON-STANDARD lamps when used in common medium screw base table fixtures.

E. Conclusion

Lemnis agrees that clear labeling requirements will enhance consumer understanding and ultimately foster adoption of LED lamps. We appreciate the attempt to create the Proposed Icons, but sadly this draft does not achieve our mutual goals. Our Alternative Icons directly inform consumers about lighting characteristics, using objective data to ensure consistent messaging. We strongly urge you to adopt the Alternative Icons as a replacement for the Proposed Icons.

Labeling requirements aside, the root problem is that the "Standard" omnidirectional category lamp specification forces vendors to meet two hyper-technical design criteria that actually contradicts proven consumer preferences and results in higher priced lamps. An A-line replacement lamp has a series of attributes: color rendering index, color temperature, price to consumer, efficacy, overall lumen output, product life, dimmability, and then of course, light distribution (or photometric performance) and physical shape. Emphasizing one attribute over the others implies trade-offs: for instance, a heat sink that brings a lamp outside strict ANSI guidelines can increase efficacy, reduce costs, but also has an impact on light distribution. The decision by ENERGY STAR to choose very specific back-end light distribution and physical shape properties to be Standard category prerequisites appears to be the arbitrary result of negotiations between industry stakeholders, with no real link to documented and substantiated consumer expectations. The unintentional result of such an approach can be interference in the marketplace, where EnergyStar certification can be awarded to a product with a mediocre 50 lumen per watt efficacy, while a significantly more efficient 60 lumen per watt product has not path to EnergyStar certification on the arbitrary grounds that arbitrary light distribution and physical shape requirements are absolute criteria, while dimming characteristics, color temperature, CRI, etc, are not.

The Omnidirectional category should be expanded by removing the arbitrary restrictions around physical shape and light distribution, and instead treating those attributes like all others: by informing about deviations via the Lighting Facts label, or other labeling. The Lighting Facts label can be expanded to include physical shape and lighting distribution information. The Lighting Facts label already informs customers about color temperature, efficacy, CRI, and total lumen output. There is no reason why light distribution and physical shape could not be added to this information. Once this is done, the Non-Standard category should be reserved to truly Non-Standard bulbs.



Please feel free to contact me at alex@lemnis-us.com or (415) 305 5189 for any additional information or clarifications on our comments and position. We applaud the work that the EPA is doing and fostering the adoption of LED lighting, and continue to believe that ENERGY STAR is a key certification that will be critical in helping the development of our industry.

With best regards,

Alex Nigg
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Lemnis, Inc

