

## DOE Invites Manufacturers and Buyers to Become SSL Quality Advocates

By James Brodrick, Manager, US Department of Energy, Solid State Lighting Portfolio



In July, a US Department of Energy (DOE) workshop in Portland, Oregon, brought together representatives from efficiency programs, utilities, industry, the lighting design community and other professionals interested in successful market introduction of solid-state lighting (SSL) products. Hosted by DOE, Bonneville Power Administration, Energy Trust of Oregon, Northwest Energy Efficiency Alliance and Puget Sound Energy, this conference offered a full schedule of sessions on a wide range of topics related to market deployment.

One note that was repeatedly sounded was quality. The rapid pace of SSL advances, coupled with a growing awareness of how crucial energy efficiency is to our national wallet and our energy and environmental future, has led to the swift market introduction of numerous SSL products. While many of these products are quite good, independent testing conducted through the DOE CALiPER test program<sup>1</sup> shows us that many do not meet their reported performance claims.

Through the Energy Star program<sup>2</sup>, DOE has established industry-wide performance criteria that manufacturers can use to promote a range of qualifying products. In September 2007, DOE issued Energy Star criteria for SSL luminaires, and the first Energy Star-qualified products are expected to arrive in the marketplace in late 2008.

The DOE Energy Star program for SSL products is a solid step toward distinguishing quality products, and at the Portland conference, DOE took another step on that path with the introduction of a new initiative called SSL Quality Advocates. Jointly developed by DOE and the Next Generation Lighting Industry Alliance (NGLIA), this initiative is designed to improve the quality of SSL products by:

- Defining minimum criteria for reporting performance
- Encouraging greater consistency in industry reporting of SSL performance through reference to standards
- Introducing the SSL Quality Pledge for manufacturers, retailers, utilities and other stakeholders

### Learning from the Past

Experience shows that intelligently managing the market introduction of new technology is vital to long-term success. DOE and its partners learned some uncomfortable lessons from the introduction of compact fluorescent lighting (CFL) products in the 1970s and we are determined to avoid those pitfalls in the SSL marketplace.

According to the DOE report *CFLs in America: Lessons Learned on the Way to Market*, the technical and quality problems with early CFLs grew into major roadblocks to consumer acceptance. At the same time, manufacturers and retailers were not guided by a common language for products and performance, and the lack of testing programs and standards allowed unclear, misleading and exaggerated performance claims. Confused consumers are unhappy consumers, and that's why CFLs had, by 2006, achieved a meager market share of just 2 percent. While that market share has increased in recent years, DOE and its partners are eager to avoid repeating mistakes from the past.

CFLs taught us that early experiences with a product can define consumer attitudes for decades. It is critical to guide the market introduction of SSL products because our country cannot afford to squander the energy-saving potential of this technology. As a nation, we use about one-quarter

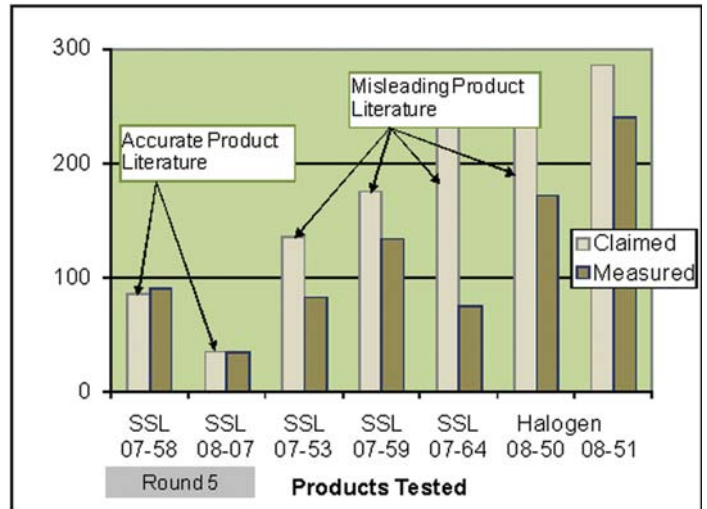


Figure 1. CALiPER Test Results: Claimed vs. Measured Light Output for MR16 Lamps

of our electricity for lighting, at a cost of more than \$50 billion annually. SSL has the potential to reduce lighting energy use by 50 percent. But SSL products won't save any energy sitting on the shelf, and if these products do not meet consumer expectations, that's where they'll stay. It's more than a question of creating quality products: communicating accurate information about product characteristics and performance is crucial to ensure that early adopters of SSL technology have a good experience.

### Accuracy Supports Quality

Many, perhaps most, of the SSL products introduced so far are reasonably good. However, some concerns have surfaced:

- Low light output is quite common, often lower than claimed.
- Disappointing lifetimes contradict excessive claims of longevity.
- Color quality is poor or inconsistent.

DOE CALiPER test results highlight the disconnect between some manufacturer claims and the actual performance of their luminaire products. Figure 1 provides a snapshot of test results on LED MR16 replacement lamps. It is important to note that not all these tested products are bad products, but their performance claims are misleading. Even the benchmark testing of halogen MR16 products shows misleading claims for light output.

The Quality Advocates team is working to assure accurate representation of LED products coming to market. The team has developed guidelines for accurately and consistently reporting product performance: in laboratory studies, press releases, manufacturer data sheets and materials designed for consumers.

The team has defined five critical parameters that should be part of an SSL product's quality analysis: lumens, lumens per watt (efficacy), input power, correlated color temperature (CCT) and color rendering index (CRI). The team emphasizes that both lumens per watt and total lumen output refer to the luminaire and must be measured using the new IESNA standard, LM-79-2008. These parameters and other recommendations are detailed in a new guide, *Reporting LED Luminaire Product Performance*.

The guide also introduces a new Lighting Facts label, similar to a nutrition label, which provides a quick and simple summary of product performance data for the five critical parameters. The label (Figure 2) is designed to be affixed either on the product, the product packaging and the product literature.

To continuously improve SSL product quality, additional metrics may be

considered for future editions of the brochure, related to reliability, product consistency, construction or other parameters. The team is also working on a parallel brochure with critical parameters and guidelines for light sources.

**Take the Pledge**

The DOE initiative is designed to build a growing community of SSL Quality Advocates throughout the lighting supply chain who are committed to supporting and implementing continuous improvement of SSL product quality. A key component of the initiative will be a voluntary SSL Quality Pledge; the Pledge program will launch in early 2009. Participating manufacturers will agree to follow the guidelines for reporting luminaire performance and to use the Lighting Facts label.

These manufacturers will benefit through:

- Public recognition as an SSL Quality Advocate and a technology leader dedicated to quality
- User confidence in the quality of products and the accuracy of program participants' claims
- Enhanced customer satisfaction and accelerated market development

Others in the supply chain such as buyers, contractors, lighting designers, distributors, retailers, utilities and efficiency organizations may also become SSL Quality Advocates by pledging to support the initiative. These advocates promise to look for and use products from manufacturers who participate in the SSL Quality Pledge program.

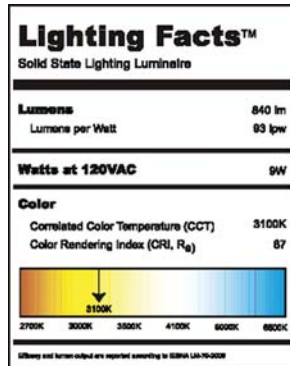


Figure 2. The Lighting Facts Label

Accurate and consistent reporting of SSL product performance is a foundation for product quality and buyer satisfaction. Encouraging the development of high-quality products that perform as claimed will help improve market acceptance, a lesson learned the hard way from ineffective early efforts to win customer approval for CFLs.

*References*

- 1.) *The CALiPER program conducts independent testing of commercially available LED products. Learn more at [www.netl.doe.gov/ssl/comm\\_testing.htm](http://www.netl.doe.gov/ssl/comm_testing.htm).*
- 2.) *The ENERGY STAR program is a voluntary energy efficiency labeling program. Learn more at [www.netl.doe.gov/ssl/energy\\_star.html](http://www.netl.doe.gov/ssl/energy_star.html).*

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**DOE Online Resources:**

- The complete DOE July workshop report is available for download at [www.netl.doe.gov/ssl](http://www.netl.doe.gov/ssl).
- To view the *CFLs in America: Lessons Learned on the Way to Market* report visit [www.netl.doe.gov/ssl/072806.html](http://www.netl.doe.gov/ssl/072806.html).
- To view the *Reporting LED Luminaire Product Performance* report visit [www.netl.doe.gov/ssl/Portland\\_2008/materials\\_2008.html](http://www.netl.doe.gov/ssl/Portland_2008/materials_2008.html).
- To learn more about the DOE SSL Quality Advocates initiative, see: [www.netl.doe.gov/ssl/qualityadvocates.html](http://www.netl.doe.gov/ssl/qualityadvocates.html).

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