Postings: from the desk of Jim Brodrick

This week, the Round 12 Summary Report for the CALiPER testing program was published, and as usual, the results are worth noting. For those of you who may not know, CALiPER stands for Commercially Available LED Product Evaluation and Reporting, and it's a DOE program that supports the testing of a wide array of SSL products available for general illumination. Those products are compared for benchmark purposes with similar products that use traditional light sources, and the results of each testing round are highlighted in a Summary Report that's posted online, with detailed reports going into greater depth.

CALiPER Round 12 focused mainly on recessed downlights, track lights, and replacement A-lamps, and some of the results applied to all of the categories. For example, one of the issues with LED lighting has been its color quality, but that's starting to change. Color quality was significantly better than it was in Round 11, with almost all of the LED products tested in Round 12 having a CCT in the warm-white range and a CRI above 80. That, combined with an overall improvement in D_{uv}, makes the Round 12 LED products comparable to their traditional counterparts as far as color is concerned – no small feat, considering that it's easier to achieve higher efficacies with LEDs that emit cool-white light than with those that emit the warm-white light consumers tend to prefer.

The steady increase in efficacy we've been seeing continued in Round 12, although it might not be obvious from a cursory glance at the Summary Report. That's because the average efficacy of all SSL products tested in Round 12 was 46 lm/W, which is slightly *lower*

than the overall average seen in Round 11. How could that indicate an increase in efficacy, you might ask? Well, when we look at the details, we see that it's actually *higher* than the average for warm-white SSL products tested in previous rounds, when many of LED products tended to fall into the cool-white range. This means that in a true apples-to-apples comparison, the efficacy trend is still upward.

The results of Round 12 also confirm that LED recessed downlights and track lights are now able to provide high-efficacy alternatives to their traditional counterparts. While those tested varied in terms of light output, efficacy, and beam characteristics, all of the 4-6" SSL recessed downlights matched or exceeded the average light output levels for similar products that use CFL, incandescent, or halogen lamps – and achieved three to six times the luminaire efficacy of incandescent or halogen recessed downlights. As for the SSL track lights, although their average efficacy is still lower than for SSL recessed downlights, they still significantly outperformed the benchmark track lighting products.

The results of Round 12 testing were also encouraging for SSL A-lamps, which showed significant improvements over previous rounds. All eight LED products tested had efficacies of at least 50 lm/W, with one of them achieving 97 lm/W. That's especially impressive when you consider that their relatively small size not only restricts thermal management, but requires that the drive electronics be compact and located close to the LED devices.

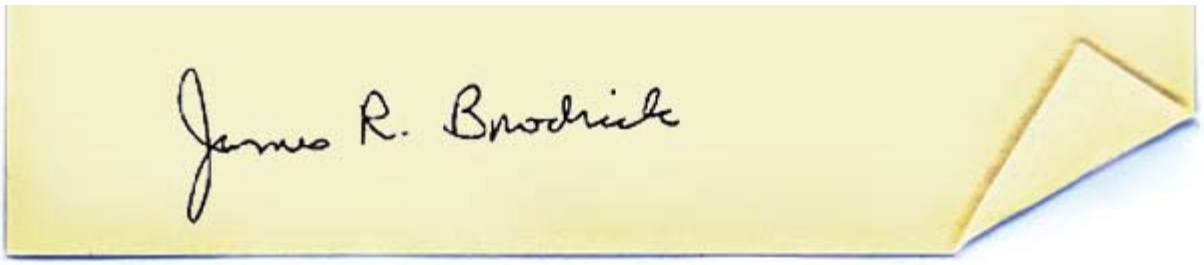
In terms of color, all but one of the SSL A-lamps emitted warm-white light, with a CRI greater than 80. Two of them achieved the light output levels of a typical 60W incandescent bulb, and one of those two products even mimicked the omnidirectional distribution of incandescent bulbs. However, most of the SSL A-lamps tested had beam patterns that were directional rather than omnidirectional, making them more comparable to reflector lamps (R-lamps) than to the A-lamps.

Things also looked good overall for the A-lamps in terms of manufacturer claims. Three-quarters of them are listed by the DOE Lighting Facts® program, and the performance of all but one of these met manufacturer ratings and equivalency claims. In contrast, the two products that are not listed by Lighting Facts both had equivalency statements that were inaccurate, and one of these also had inaccurate manufacturer ratings in addition to being significantly larger than the standard A-19 format. The latter characteristic might cause problems when trying to screw the product into some sockets – another *caveat emptor* for consumers.

So it's clear that, although there's been progress made with SSL A-lamps, there are a number of things to consider when making purchases. That's why we'll be taking a deeper dive into those issues with a special panel at DOE's sixth annual SSL Market Introduction Workshop, which will be held in Seattle July 12-14. The panel will look at what the latest DOE Lighting Facts Product Snapshot tells us about SSL replacement lamps, as well as what we can learn from a new CALiPER study that purchased such products directly from big-box retail shelves. That study found that the small replacement lamps purchased showed far less consistency of performance, and significantly poorer performance on average, than the replacement lamps tested in Round 12. There'll also be a representative from one of the major chains, giving a retailer's perspective on how to use DOE's Lighting Facts program to assist in product selection and consumer education.

With the efficiency requirements mandated by the Energy Independence and Security Act of 2007 slated to start rolling out next year, LED replacement lamps are an especially hot topic these days, and I hope to see many of you there in Seattle.

As always, if you have questions or comments, you can reach me at postings@lightingfacts.com.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