



Royal Pacific, Ltd.

Value, Quality, Energy Efficient

**Sustainability:**

**LED products newsletter sent by 09/30/2009**

**From: SSL (Solid-State Lighting Quality Advocates)**



## *Postings: from the desk of Jim Brodrick*

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A few weeks ago we published the latest round of Commercially Available LED Product Evaluation and Reporting (CALiPER) test results and since then I've been asked several times for my perspective on the results. The [CALiPER Round 8 Summary Report](#) focused on replacement lamps, including MR16s, PARs, and small, omni-directional replacement lamps like candelabra bulbs for a dining room chandelier. Keep in mind that CALiPER testing is a snapshot in time--by the time results are published, new versions of products are arriving on the market, with updated packaging or the inclusion of a whole new generation of components. It's a lot like the electronics world, where a laptop or digital camera that's been reviewed in the spring has already been replaced with a new model by summer. With that caveat in mind, CALiPER does provide useful insights into where the solid-state lighting market is today.

Overall, Round 8 confirmed the continuous upward trend in performance improvement since DOE began CALiPER testing in 2006. Clearly more SSL products are now approaching, matching, and, at times, exceeding the light output levels, distribution, and color quality of their conventional counterparts. In particular, there are several exciting updates from the Round 8 report that I'd like to highlight, starting with MR16 lamps.

Last fall, CALiPER benchmark tested conventional and SSL MR16 lamps from the buyer perspective. We found wide variations in performance, and the [CALiPER MR16 Benchmark Report](#) published in November 2008 concluded that then current MR16s did not meet 20W halogen levels, much less 35W or 50W halogen lamps. Now, just 8 months later, the results

for SSL MR16 lamps tested in Round 8 are quite encouraging. With respect to color, all have CRI over 70, with the best at 93. All have warm white or neutral white CCT levels, which is fairly similar to the most common halogen replacement lamps. And as for total light output, one of the warm white SSL MR16 lamps clearly meets and exceeds what a buyer would expect of a 20W Halogen MR16 lamp, and delivers over 3 times the average efficacy of halogens.

Another highlight is the progress of larger directional lamps, such as PAR20, PAR30 and PAR38s--you might call them flood or spot lights. There was clear improvement in these lamp types, some now capable of meeting light output levels and beam characteristics of 35-50W incandescent and halogen lamps, with efficacy levels similar to lower wattage RCFL products. While some need improvement in product performance reporting, power factor, and color quality, overall they are now becoming competitive with lower wattage incandescent, halogen, and RCFLs.

Unfortunately, a disconnect remains between manufacturer claims and actual performance. Whether deliberate or accidental, more than half of the products tested in Round 8 have inaccurate or misleading product literature claims, a recurring theme in all CALiPER testing to date. In particular, equivalency claims are often solely for the replacement lamp and not for the actual measured performance when integrated into a luminaire. This reflects the learning curve many product integrators face as they begin to better understand how to measure, report, and assess LED products. Overall, there has been a steady improvement in the accuracy of manufacturer performance claims since CALiPER testing began in 2006, and I look forward to the day when this is no longer an issue.

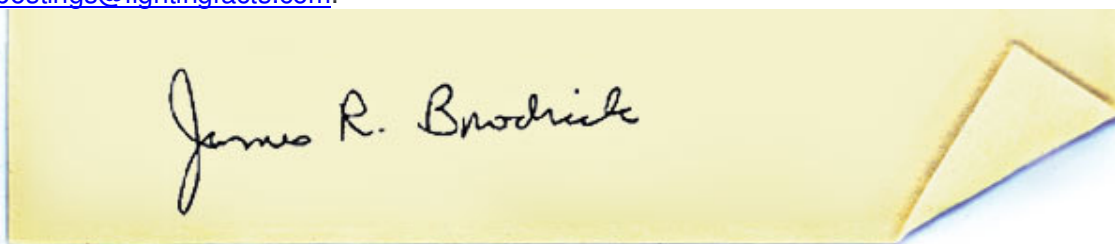
In addition, none of the omni-directional replacement lamps tested in Round 8 would truly satisfy buyers expecting a one-for-one replacement lamp, except perhaps for applications that are currently over lit, or where only sparkle is needed. All five products tested are dimmer than claimed; four of the five have poor power factor; and three of the five provide much cooler white light than claimed. The performance of all five SSL omni-directional lamps tested in Round 8 is disappointing because none meets the claims published in manufacturer specifications and sales literature.

Wading through all the claims of LED product performance is a rocky business to begin with, and is only made more difficult by the rapid pace of change in the technology and related factors. So what's a buyer to do? Ask for LM-79 test results or the [Lighting Facts Label](#), or choose products that have obtained the [ENERGY STAR rating](#). The credibility of manufacturer ratings is greatly increased if explicit performance values are published (such as light output,

efficacy, CBCP, CCT), and further reinforced if LM-79 test results are published for a product. Ensure that those results reflect the exact version of a product under consideration and cross-check that information with other sources whenever possible.

Again, the overall trends we see in CALiPER Round 8 are encouraging-the improvements we hoped to see in lamps intended to replace low wattage incandescents is starting to become a reality. The best we can do is "call them as we see them" and hope that our information and experience helps the average user avoid the pitfalls inherent with any new technology. The key is to do your homework and make informed decisions when it comes to these lighting products. To learn more about Round 8 of CALiPER testing, visit the [CALiPER section](#) of the DOE SSL website.

As always, if you have questions or comments, you can reach me at [postings@lightingfacts.com](mailto:postings@lightingfacts.com).

A yellow sticky note with a blue border and a folded corner on the right side. The note contains the handwritten signature "James R. Brodrick" in black ink.