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The Latest on LED Troffers

Troffers are a staple of the lighting industry, providing economical ambient lighting in offices, schools, and commercial spaces. They come in a variety of form factors — typically 2×4, 2×2, and 1×4 — and traditionally have utilized a variety of optical systems, such as lenses and louvers, to meet different needs or simply to provide a different appearance.

In April 2014, DOE’s CALiPER program published a Snapshot Report that included troffers, but a lot has changed since then. That’s why we’ve come out with a new Snapshot Report on LED troffers and troffer retrofit kits, and the findings are instructive.

CALiPER Snapshots are based on DOE’s LED Lighting Facts® database, which includes tens of thousands of current products and now allows users to graph product-category growth and efficacy over time. Because the linear fluorescent lamps with which troffers have traditionally been fitted are relatively efficacious, LED troffer products made a delayed entrance to the LED Lighting Facts database, not comprising a significant portion of it until 2013. Today, almost 20% of the products listed with LED Lighting Facts are troffer luminaires or retrofit kits, both of which tend to be more energy-efficient than their fluorescent counterparts while offering comparable color and power quality.

Whereas the mean efficacy of LED troffer products in early 2014 was 90 lm/W, today it’s 102 lm/W. More than 10% of the troffer products currently listed with LED Lighting Facts have a luminous efficacy greater than 125 lm/W — substantially higher than the efficacy of fluorescent-based troffers, which tops out at under 100 lm/W.
Troffer retrofit kits may or may not reuse the existing luminaire’s optical system (e.g., lenses), which will affect the performance of the complete system. A product using the existing luminaire’s optical system will have a lower efficacy than when it’s tested by itself. This introduces a confounding factor when making comparisons using aggregate data in the LED Lighting Facts database.

While size is reported for most troffers listed by LED Lighting Facts, information on optical systems and distribution of light is more limited. As a result, distribution of light is not discussed in the new Snapshot, although it can be a key factor that influences the final efficacy of products. Luminaires with more-sculpted distribution typically use more-extensive optical systems. This may lower the luminaire efficacy, but in some cases fewer luminaires could light the same space to the same illuminance level, providing greater application efficacy. As always, the best product is the one that’s the right fit for the application.

The light output of listed LED troffer products is more than sufficient to match that of conventional troffers. For some LED products that manufacturers classify as troffers, the output is much higher than the typical range, sometimes exceeding 10,000 lumens. When making a one-for-one exchange, it’s always best to determine the amount of light needed, then find the right product to provide the correct illuminance.

As for color quality and power quality, LED troffers almost all offer the same performance as their fluorescent counterparts. The availability of a range of CCTs is a positive, but the limited variety of CRI values — almost all of which are in the 80s — doesn’t reflect the ability of LEDs to provide higher levels of color-rendering performance when needed.

In terms of the data captured by LED Lighting Facts and reported in the new Snapshot, LED troffers offer a compelling alternative to fluorescent troffers. This applies to both troffer luminaires and troffer retrofit kits, whose performance was nearly indistinguishable. While the new report focuses on basic photometric characteristics, choosing a product for a specific installation requires a more comprehensive analysis. The new LED Lighting Facts Specification Tool can be used by lighting professionals to review and assess products in the database.

For a closer look at the findings, download the full report.

Best regards,
Jim Brodrick

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