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More About Color-Tunable LED Luminaires

Back in September, we ran a [Posting on color-tunable luminaires](#), noting the new section of the DOE SSL website devoted to the topic and the newly published [Report 23: Photometric Testing of White-Tunable LED Luminaires](#), the first in a [CALiPER](#) series on color-tunability. Luminaires that can change their spectral power distribution are nothing new, but the advent of LEDs has made such products a lot more practical, resulting in a growing buzz about potential benefits that range from improved health and well-being to increased productivity, enhanced mood or alertness, and higher occupant satisfaction.

DOE has just released an addendum to [Report 23](#) that examines the effect of the number of measurement points across the tuning range on the measured values for key product characteristics. The CALiPER testing on these products evaluated the performance at the two extremes of the CCT range, plus at nine points in between. The new analysis compares values derived from all 11 of these points with values derived from using three, five, or six measurement points from the same test procedure, in order to see if the less burdensome testing regime would yield accurate information for the specifier.

In addition, we've expanded our [related web section](#) considerably, so it now offers guidance on specifying, controlling, and testing LED color-tunable products, as well as useful information on the three basic types of those products (dim-to-warm, white-tunable, and full-color-tunable), including the applications they're used for and the major issues that are associated with them.

Specifying LED color-tunable luminaires is dependent on being able to make accurate comparisons among products. Yet reporting performance values for color-tunable products is much more complicated than it is for other LED product categories. Not only does the range of possibilities make it more challenging to measure and communicate performance, but there are no standardized test procedures to follow. The expanded web section outlines the kind of information that specifiers need to know but that is often missing from cut sheets, and suggests what data manufacturers should consider providing for the minimum, mid-range, and maximum CCT settings, in the absence of industry guidelines. It also lists recently encountered issues in ordering color-tunable lighting systems.

Controlling color-tunable luminaires can be challenging for specifiers, since different manufacturers use different approaches — with some providing proprietary control devices that often rely on an existing protocol with a customized user interface/hardware, and others relying on controls using standardized or open protocols, often from third-party manufacturers, which provide a greater range of options but may also lead to compatibility issues. The expanded web section explains how controls for color-tunable luminaires work, discusses the most common protocols and applications for wired and wireless control, and takes a look at dimming curves and why they're so important. It also considers the user interface for controls, and lists the major issues specifiers and manufacturers should consider when specifying or offering control systems for color-changing luminaires.

At this point, it's important to understand the potential tradeoffs, limitations, and issues associated with this emerging product category, so that industry can work together to address challenges needing attention as these products mature. To that end, look for even more content to be added to DOE's [web section on LED color-tunable luminaires](#), including additional reports in the CALiPER 23 series.

Best regards,
Jim Brodrick

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