

Postings: from the desk of Jim Brodrick

One of the things I've tried to convey in these *Postings* is the tremendous amount of behind-the-scenes work in solid-state lighting to facilitate the progress that drives the market and makes the headlines. The development of standards and test methods that consistently characterize product performance and assure safety is a key part of that behind-the-scenes work. Establishing a set of ground rules keeps the entire industry singing from the same song sheet and imposes a certain amount of order on what could otherwise become a Wild West, anything-goes type of situation.

One of the most eagerly anticipated SSL documents in the works is IES TM-21, a method for estimating the lumen maintenance of LED packages, arrays, and modules that's being developed by the Illuminating Engineering Society of North America. TM-21 is intended for use with another IES test method, LM-80, which sets forth procedures for measuring lumen maintenance but doesn't provide a method for using that data to extrapolate in time an estimate of 70% lumen maintenance—which, as you know, is a hot topic these days in solid-state lighting.

Although the useful life of an LED package or module is just one aspect of luminaire reliability—which also has to take into consideration other luminaire components—it's still a key and especially tricky issue. Industry consensus is that an LED module's useful lifetime ends when the initial lumen output has declined by 30 percent—a point often expressed as "L₇₀" to indicate that the lumen output has fallen to 70 percent of its initial value. The question is how to determine in advance when L₇₀ will be reached, based on

the minimum 6,000 hours of testing that LM-80 requires.

TM-21 lays out a way to do just that—a consistent method for estimating lumen maintenance well beyond 6,000 hours of test data. The result of two and a half years of arduous work on the part of the IES committee tasked with its development, TM-21 is now undergoing IES review and comment, with publication expected in the next few months. Until SSL develops the kind of performance history already established by more mature lighting technologies, TM-21 will stand as the most consistent method available for estimating luminaire lumen maintenance.

To keep pace with SSL's rapid development, LM-80 is currently undergoing its regularly scheduled two-year committee review focused on any recently discovered issues that may need to be addressed by updates. Another IES standard, LM-79—which specifies a test method for measuring the photometric and electrical properties of SSL—is undergoing a similar review.

In another noteworthy development on the SSL standards front, the National Electrical Manufacturers Association (NEMA) has just published two related standards, SSL-1 and SSL-6, which should have a significant impact. Whereas LM-79 looks at lamp performance, SSL-1 ("Electronic Drivers for LED Devices, Arrays, or Systems") focuses on the driver, which many feel is likely to fail before the other luminaire components. With the publication of SSL-1, it may be easier for manufacturers to design drivers to last as long as the LEDs.

NEMA SSL-6 ("Solid State Lighting for Incandescent Replacement – Dimming") deals with the issue of dimming LED replacement lamps. Although LEDs are dimmable in theory, in practice this is true only if the driver has dimming capability *and* is compatible with the particular dimming control used. SSL-6 addresses this by providing interface recommendations for dimming control of integrated LED lamps intended to replace general service incandescent products.

The result should be a reduction in dimming problems with LED lighting products, as more manufacturers adopt the new standard.

A big tip of the hat to all those unsung heroes working away out there in standards land, because without your efforts, solid-state lighting would not be making the rapid progress we've been seeing and would not have already started to fulfill its energy-saving potential.

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

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