March 17, 2016

Understanding TM-30

IES TM-30-15 has been generating a great deal of buzz lately—including in these *Postings.* That's because it's a real game-changer in terms of characterizing the color rendering of light sources, as it's intended to provide much more-detailed information than CRI, whose limitations are widely recognized. But it's also quite a bit more complex than CRI, so DOE has created several useful new resources to help you understand TM-30 and how to use it—including a fact sheet, a video, and an extensive FAQs webpage.
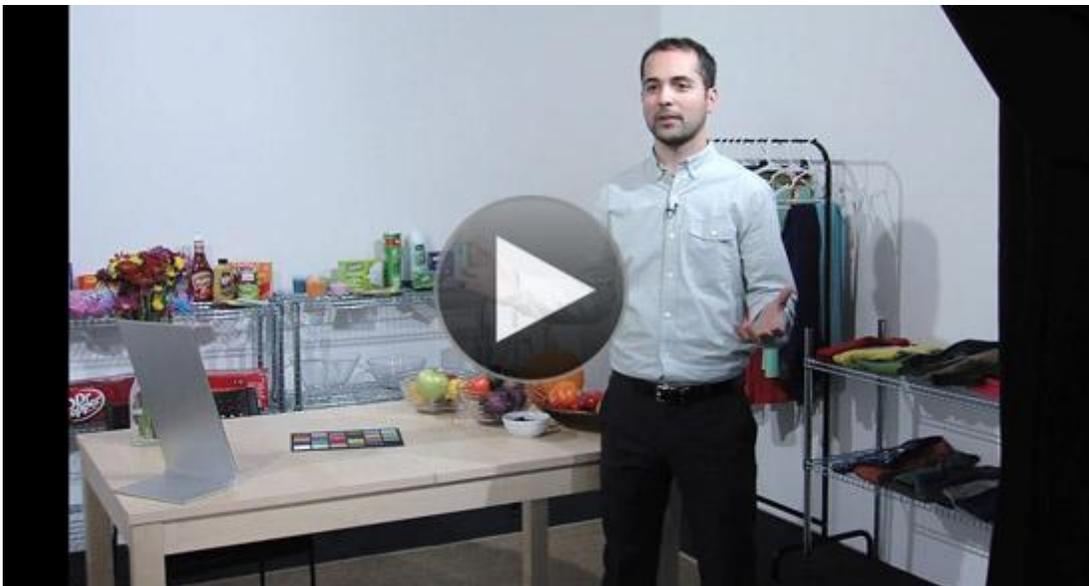
Simply put, TM-30 describes a whole new method for evaluating light-source color rendition. It was created by a task group of the Illuminating Engineering Society (IES), who examined and synthesized the research of numerous other groups in developing the TM-30 method. That method encompasses several individual measures and graphics that complement one another and, together, provide a comprehensive characterization of how the light will affect the color appearance of objects.

The scope of TM-30 is greater than in other systems; that is, it goes beyond average fidelity and average gamut measures and thus can improve the

correlation between quantifications and human judgments. In contrast, CRI is purely a method for evaluating color fidelity, which is not correlated with the color rendering that people prefer.

TM-30 includes multiple average measures and graphical representations. It relies on improved color science and a more comprehensive set of color samples. Unlike CRI, whose eight color samples are pastel, TM-30 uses 99 color samples that come in all hues, both saturated and unsaturated, and were chosen to cover the range found in common consumer goods and natural objects. The three highest-level components of TM-30 are the Fidelity Index (R_f), the Gamut Index (R_g), and the Color Vector Graphic. Numerous sub-indices can provide more-detailed information about such things as the color fidelity of reds, the chroma shift of reds, and the fidelity of skin tones. The variety of measures can be used together to find the best source for a given context; TM-30 does not include a universal measure for preference.

IES is working on TM-30 guidance for users, and the International Commission on Illumination (CIE)—which developed CRI—is also looking at TM-30 and may offer comments or recommendations in the near future.

But just because TM-30 is not yet a required standard doesn't mean it can't be used to improve the engineering and specification of light sources. Manufacturers are beginning to publish TM-30 data for their product offerings, but if those data are not available, they can be calculated from a spectral power distribution. For more information about TM-30, visit the DOE website.

Best regards,
Jim Brodrick

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