

HIGH EFFICIENCY LIGHTING

LEDs and other new technologies are an attractive solution as modern and efficient light sources for television productions. However, their introduction is leading to unintended and possibly expensive consequences of poor colour reproduction. The EBU is helping to address the issues.

BACKGROUND

Broadcasters are continually looking for more efficient technologies and thus, more and more are introducing LED lighting in their studio environments. But it isn't until the final images are seen that the problems of colour-rendering consistency become obvious. And when a television camera captures the wrong colour it is firmly embedded in the signal; no colourist can correct all of the problems this creates.

THE CHALLENGE FOR PUBLIC SERVICE MEDIA

LEDs offer several advantages in terms of energy efficiency, light weight, long life and the reduced need for power hungry air conditioning systems. Most EBU Members are already using these light sources in their daily production for reasons of economy.

Nevertheless, LED lighting opens the door to several problems with colorimetry or colour reproduction, resulting in reduced picture quality. As broadcast television is constantly seeking to improve picture quality (in order to maintain sales potential in a converging market), colour fidelity and consistency are important factors in these efforts.



Left: The ColorChecker™ chart shows the different appearance of a set of colours under different lighting conditions.
Right: This photo illustrates the impact that different LED light sources can have on skin tones.

There is only one internationally approved measurement system for the assessment of light sources, the Colour Rendering Index, which dates originally from the 1960s, and is aimed at colour rendering for the human viewer rather than the TV camera. The BBC pioneered some research with the development and proposal of a Television Lighting Consistency Index (TLCI) in the 1970s and 80s, but this needed to be updated for modern camera channels.

WHAT IS THE EBU DOING?

Research on the TLCI was taken forward by an EBU project group on LED lights. The group produced a Recommendation on lighting measurement, R 137. A 2014 update of the TLCI was produced as part of the work, with software and supporting documentation available for free download. The EBU is exploring the possibility of co-operating with the industry on having the software incorporated into measurement tools. The work was presented at the EBU booth at IBC 2012 and further work has been done since then.

Rather than assess the performance of a luminaire directly, as is done in the Colour Rendering Index, the TLCI mimics a complete television camera and display, using only those specific features of cameras and displays which affect colour performance. The TLCI is realised in practice using software rather than real television hardware. The only hardware that is required is a spectroradiometer to measure the spectral power distribution of the test luminaire, and a computer on which to run the software analysis program to perform the calculations.

The Television Lighting Matching Factor (TLMF) is a spin-off of this work which allows practical comparisons between light sources to enable programme makers to assess the compatibility of different luminaires which might be used together.

Cooperative work with SMPTE and other colorimetry experts strengthened the work done by the EBU LED project group.



Colorimetry expert Alan Roberts and LED Project Group chair Per Böhler demonstrating the TLCI at IBC 2012.

FIND OUT MORE

TLCI-2012 documentation and software
EBU LED Lighting group

tech.ebu.ch/tlci-2012
tech.ebu.ch/groups/led