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Soft proofing and WYSIWYG

Viewing conditions crucial to color matching

Adobe Photoshop Soft Proof aims to produce a preview on-screen that accurately shows how the file will output as some kind of printed piece.

The goal of color management in this case is to reproduce the file so that what you see (on-screen) is what you get—WYSIWYG. When all the pieces of the color management puzzle are in place, the ability to predict output based on the image on your display can be amazingly close. This saves time and money. Some important elements need to be addressed to achieve this elusive goal.

A crucial fact to understand from the very beginning is that a reflective print and a backlit display can never exactly match each other. This would simply break the law of physics. With a CRT display, we have glowing phosphors; with LCDs, we have backlit fluorescent light. Both are emissive devices. A reflective print simply cannot match the intensity and range of such devices, but we can get it very close. But every element in play must be dealt with correctly.

In previous issues, I've discussed the need for accurate calibration of the display system and subsequent ICC profile, and for accurate ICC profiles for the output device we hope to simulate on-screen. If either profile is inaccurate, there's no way to produce a correct soft proof or predict the appearance of the final print.

The environmental conditions under which both the print and the display are viewed play a key role in screen-to-print matching. Most photo studios have daylight-balanced viewing boxes for transparencies. Yet even though it's every bit as crucial to also have daylight-balanced light boxes for viewing reflective prints, few studios do. It is essential for color management to be able to view prints under controllable lighting for comparison to the soft proof on the display.

Usually, output profiles assume a daylight-balanced condition for viewing the subsequent print. Some advanced profiling packages allow users to measure the light in a certain environment and build that data into a printer profile, but the point is, the printer profile and the viewing conditions need to be in sync. It's true that many customers will be viewing the final prints under far from daylight-balanced lighting, but for the imager, a daylight balanced reflective box is a necessary accessory.

Ideally, such a light box will sit near the display so you can the print and the display together. Stray light can affect your perception of the soft proof, so position the light box so that no light spills on the display. Usually, placing the light box at a 90-degree angle from the display will do it. It will also allow you to view first the display, then the light box, giving your eyes a second or two to adapt to each. I prefer light boxes with dimmers. Most light boxes are too bright compared to the display, so having the ability to dim the box while maintaining daylight balance is key to

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producing a good screen-to-print match.

The ambient light in the studio where the display resides is also critical. Not only should the ambient light be rather dim, but also as close to daylight balanced as possible. No ambient lighting should fall on the face of the display. Bright colors on adjacent walls can greatly affect color perception. Ideally, the display luminance and the light box will be the brightest two objects in the environment.

You can adjust the luminance of an LCD to much higher levels than you can a CRT's. Many of the display calibration and profile packages allow you to set or report the luminance in units of candelas per meter squared* (cd/m2). CRT displays are usually calibrated to about 95-100cd/m2, while LCDs can produce much higher values, in a range of 120-140cd/m2.

The brighter the display luminance, the brighter the ambient environmental lighting can be set for acceptable matching. CRTs need to be viewed in quite dimly lit rooms. The recommended intensity is in the neighborhood 16-25 lux**, which is pretty dim.

The key to getting excellent and accurate soft proofing from screen to print is to ensure that all the profiles being used are accurate and that proper lighting and environmental factors are correct and accounted for. If you're in the position to really control your environment, consider looking into the International Organization of Standards (ISO) specifications ISO 3664:2000 "Viewing Conditions: Graphic Technology and Photography." You'll find a number PDFs that discuss some of these specification written by GTI technologies, a company that makes very nice light boxes, at www.gtilite.com/gti-technote-archive.htm. The ISO has a number of other specifications on display and proofing documents such as the ISO 12646:2004: "Graphic technology: Displays for colour proofing —Characteristics and viewing conditions." These specifications are available for purchase at www.iso.ch/iso/en/ISOOnline.frontpage. ❑

**The candela per meter squared (cd / m 2) is the standard unit of luminance. It represents a luminous intensity of one candela radiating from a surface whose area is one square meter.*

***Lux. Lumens per Square Meter, a unit of illumination. To provide an idea of the values discussed above, full daylight ranges approximately from 3200 to 10,000 lux, while a typical office is approximately 200 to 400 lux. Twilight is approximately 10 lux. See www.intl-light.com/handbook/irrad.html.*