

Finding 'Perfect' Color

The idea that today's color-management technology is capable of giving you "perfect" color is a myth. There's no such thing as perfection when it comes to color; too many variables are involved that affect how we see color—including viewing conditions, temperature, humidity, paper and ink properties, and so on. Also entering into the mix is the fact that no two individuals see color in exactly the same way; each person's brain processes and then interprets the various wavelengths of light ("color") differently.



It is possible, however, to control color to the extent that it will be consistent. At the IPA color-proofing tests this year, for example, it was demonstrated that today's color-management technology is capable of keeping color shifts in proofs within 1 Delta E. Although that's a bit of an arbitrary measurement, it's not stretching

things too far to say that the human eye has trouble seeing a color shift that small. If the human eye can't see the difference, it's "close enough." The solution to getting color as close as possible to your goals comes in proper profiling and calibrating.

Profiling and fingerprinting

Several levels of color management exist; two of the most common are "profiling" and "fingerprinting" different devices.

Creating a profile requires rather sophisticated hardware and software. The idea is to compare how a device prints a target image with the known color characteristics of the image. Each device—even two "identical" printers built the same day by the same manufacturer and using the same inks and paper—will have slightly (sometimes dramatically) different color characteristics.

To create a profile, the operator prints a known target with no color correction at all [an unadjusted picture of where the machine is in its natural state]. The target is read with a spectrophotometer, and those readings are compared with the known values of the target. A curve is created to force the native printing characteristics of the device to match the known values of the target. That's your "device profile."

"Fingerprinting," on the other hand, usually refers to creating a profile of a device that varies—such as a printer. Since we know that color will change from the start of the press run

to the end, several printed targets might be read to create a base profile representing the average color readings that come off the press. Remember that all of the other aforementioned factors—paper, ink, temperature, etc.—will come into play. Some companies fingerprint their printers for several different paper stocks; others, however, don't think it's worth the time and effort, particularly since you're shooting at a moving target even under the strictest environmental controls.

The number of profiles that need to be built to achieve acceptable color control is really a matter of how much time and expense you want to go through. You could build a profile for every device, every paper stock, and every inkset you might use—but it might be far more practical to profile your "standard" output conditions and assume that the rest of your output will fall in line reasonably closely.

An alternative to creating your own profiles is to use "canned" profiles, which come with many wide-format devices. Some even have profiles for different printing stocks that the manufacturer recommends and supports. These profiles can at least get you in the ballpark.

Generally speaking, creating a proper profile for a device is a bit more complicated than using a canned profile—but it's also more accurate. Building a good profile for one device can take the better part of a day because there are so many variables and so much "tweaking" involved in getting the absolute best color match throughout the spectrum of colors. Many companies don't hesitate to call in color specialists to create their profiles, and this may appeal to you as a cost-effective strategy.

Note: Before you profile, you must determine what "standard" to shoot for, if any. One such standard is the new Gracol 7, which looks mostly at gray balance, under the assumption that good gray balance is really the most difficult to achieve. Another well-known standard is SWOP [Specifications for Web Offset Printing]. While SWOP is probably the easiest and most forgiving standard to hit, it also will severely handicap wide-format printers, which are capable of hitting a much wider gamut of colors than it calls for.

Compensating for device drift

At least as important as creating profiles is keeping the devices in proper calibration. Once a device profile has been created (or adopted), basic calibration is typically all that's really needed. In fact, after the equipment has been calibrated, it's often acceptable to let the eyes of your in-house operators take over.

What's involved in calibration? Mostly it's a matter of regularly checking the output and reading in the numbers to compensate for the normal drifting of devices.

continues on p. 62