10 Tips to Improve Color Management

By Dwight Kelly, president of Apago Inc.

The primary goal of color management is to reproduce consistent, predictable, and repeatable color across a range of devices, such as scanners, digital cameras, monitors, printers, offset presses, and corresponding media. The idea is simple in theory but much more complex in practice. In your quest for perfect color management, consider these 10 tips:

1. **Prepare your files to commonly used standards**

   These include SWOP (Specifications Web Offset Publications), GRACOL (General Requirements for Applications in Commercial Offset Lithography), and PDF/X, a subset of PDF designed specifically for reliable prepress data interchange.

2. **Establish and enforce standard operating procedures (SOPs)**

   The IPA, an association of graphic solutions providers, says that only 33% of creative, design, and publishing companies have SOPs for color management. SOPs are necessary safeguards to ensure consistent color. If your company doesn't have color management SOPs, take the time to create them—and be sure that everyone adheres to them. Bypassing established procedures to get a rush job out the door only causes more severe problems on the press.

3. **Standardize preferences in all of your software applications**

   A key point to address in your company's SOPs is to standardize the software application preferences across all computers involved in your workflow. According to IPA, the majority of creative professionals do not customize their software's default color settings. This can be problematic as different versions of software applications have different defaults; for instance, Adobe CS1 used sRGB, and Adobe CS2 uses AdobeRGB. These differences can lead to significant changes in color values. Make sure everyone is using the same settings, including any customers that submit files. Your company's SOPs should clearly define if and when users should preserve, convert, or discard ICC profiles.

4. **Ensure accurate ICC profiles**

   A complete color-managed workflow requires accurate ICC profiles for all input and output devices, such as scanners, cameras, displays, and proofers. It is also important to regularly profile your display or output device, ink, and paper.

5. **Choose early binding or late binding**

   Do you work in RGB and convert to CMYK only for final output or early in the process? The timing of the RGB-to-CMYK conversion process is crucial for effective color management. Once converted, a piece is bound to a particular production method, so the decision is often characterized as early binding or late binding.

   Converting early allows jobs to be prepared within the capabilities (gamut) of the intended output device. So early binding ensures that you are not working with unreproducable colors. You can achieve consistent results with early binding provided that your SOPs specify the conversion software and settings.

   However, for most processes, late binding ensures maximum flexibility if the output device needs to be changed or if a job must be run on multiple output devices. It also avoids many potential problems, such as inconsistent use of embedded profiles. Late binding is generally more consistent because color rendering can vary depending on what software is used to convert the colors.

6. **Use device-link profiles**

   Select software and workflow tools that support device-link profiles, which allow finer control over color conversions—especially CMYK-to-CMYK transformations. It can be used for color conversion, total area coverage (TAC) control, and reducing ink costs by replacing CMY ink with cheaper black ink.

7. **Not all objects in a PDF may be color managed**

   Watch for complex objects, such as smooth shadings and transparency, which may not be supported by every software tool. In other words, just because one software application created a complex object, another application won't necessarily be able to interpret it. One solution is to convert these objects to CMYK or RBG color space by flattening the artwork.

8. **Be aware of possible inaccurate TAC calculations for documents**

   Total Area Coverage (TAC) or Total Ink Coverage (TIC) calculations can be easily made for individual images. However, if you are working with PDF documents, your software may not be able to accurately calculate TAC or TIC values because it looks at only individual objects and does not account for overprinting and transparency.

9. **Don't focus too much on small Delta-E values**

   Vendors frequently claim that their systems have an average measurement of difference between two colors, or Delta-E, of 0.5 or less. However, the devices used to measure targets have only a claimed accuracy of +/-0.5 Delta-E. The maximum real-world accuracy is limited by accuracy of the measuring devices. In addition, most output devices cannot achieve consistent Delta-E values less than 2.5. Note that the largest Delta-E errors often occur in the dark shadows where they are invisible to the human eye.

   After examining the results of the recent IPA shootout, Abhay Sharma, judging member of the IPA Board and chair of Ryerson University School of Graphic Communications

Management, said, "Achieving low Delta-E values is no longer an issue for proofing technology today. Now it is more about workflow and ease of use."

10. **Invest in software and hardware, and train employees**

    Budget between $500 to $6,000 for software and hardware, and allow sufficient time to design and test any new workflows and to calibrate/profile all of your monitors and output devices. Also, be sure to stay educated about color management. Although there is no single source for everything that is required to implement a color-managed workflow, the International Color Consortium (www.color.org) is a good place to start.

For more information call Apago at 770-619-1884 or visit www.apago.com.