

# ImageXpress UnTechnical Bulletin

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## COLOR MANAGEMENT Output Profiles



Keeping it simple. . . color management means making a picture LOOK the same every time it is seen. . . on computer monitors, over the internet, or on paper. Color management issues can be confusing, and quite difficult to understand.

Before the advent of desktop publishing, the topic of color management was reserved for a small group of highly-educated color scientists and very experienced color separators. Now anyone producing color files must have a basic understanding of the topic. It is the purpose of this series to shed accurate, non-technical light on basic color management issues.

### Profiles

A profile is simply an evaluation report. There are several kinds of profiles: input, monitor, and output. Each is a color performance evaluation of a unique device. Profiling assesses the capabilities of a single device so that color pictures captured by (or sent to) that device will address those capabilities, compensate for its inaccuracies, and portray color images as accurately as possible.

### Output Profiles

While input profiles help scanners “see colors accurately,” output profiles make sure colors printed to one printer look the same as the same colors printed to a different printer.

Sounds like something that ought to happen automatically, doesn't it?

Unfortunately, there are many different types of printers, and each prints color a little differently. While most printing devices print CMYK (Cyan, Magenta, Yellow, and Black) inks, some want to be fed RGB (Red, Green, and Blue) information. Some printers use powder toners,

others use liquid inks, yet others transfer dyes from ribbons- and they all print colors differently. There are actually even more variables, but you get the general idea. . . what sounds simple, simply ain't simple! This is the basic reason why printing the same picture to different machines delivers different results.

If you've ever viewed a number of types of televisions all playing the same show in a department store, and noticed that very few pictures look the same, you know the problem. Different manufacturers use unique electronic components, and each model produces its own look. Traditional tvs look different than rear projection tvs, small battery-operated LCD tvs look different than high-definition tvs. And so on.

Different televisions use different technologies, and therefore look. . . well, different.

The television department manager's job (lucky guy) is to make all these different tvs look as similar as possible. Let's call his job “Color Management.” How does he accomplish his feat? First he shows a common test pattern on every screen. This test “target” contains the full rainbow of colors from reds to oranges to yellows to greens to blues to purples, and a whole bunch of different shades of gray.

He then starts tuning the color adjustments on each tv, one at a time, trying to display the test target as faithfully as possible on each. He works on each one until he is convinced that he has tuned-in the best possible color settings for that tv. He knows that if he can get the test target to display accurately, the settings used will deliver great results with regular programming.

More importantly, if all the tvs are optimally tuned to the test target, each tv's picture display should look *very* similar to the others.

Although this is an extremely simplistic metaphor, the basic principle is accurate. If we are to produce the same color from different printing sources, we must “tune” the basic image uniquely for each device.

While we visually adjust a tv to accurately portray colors, we tune a printing device by an electronic color adjustment tool. The color adjustment tool is known as a profile.

As described earlier, a profile is simply an evaluation report. . . a color performance evaluation of a unique machine. A profile assesses the capabilities of a single machine so that color pictures sent to that machine, consider those capabilities, and portray color images as accurately as possible.

In the case of output profiles, a test target (much more detailed version of the one used for the tv) is printed from the printer. That printed test target is then very carefully analyzed by very accurate measurement devices to see how well it produced the colors in the test.

From the measurements taken, color limitations are discovered (and recorded) about each device. *Truth. . . no machines print all colors perfectly.* Special software then uses these limitations to create a *characterization* of that particular printer called a profile.

*Each profile is like a rap sheet for a specific printer.* A profile tells any color file sent to a printer exactly what the limitations of that printer *are*, and how to best *compensate for* its limitations, producing the most accurate, consistent results *from* that printer.

Some files can be saved with “embedded” profiles. This means that the file has been optimized for a specific output device or printing system. Files that have been tagged will not produce optimal results when printed from any other printer/system.

This is why it is imperative that you know what device will next display/print your file before you save it. If it is unknown where or how the file will be displayed or printed, save the file as a working-space RGB file. See ImageXpress’ Un-Technical Bulletin on “Working Color Space” for more information.

## Using Output Profiles with ScanPrepPro

Preparing images using ScanPrepPro avails several methods of file preparation. Since most printing systems prefer to print from color separated files, the most common method of preparation is color separation.

## Color Separations

The process of converting RGB information into CMYK information is called color separation. Photoshop 5 provides two methods of handling this conversion, color separation tables, and ICC profiles. ScanPrepPro supports both of these processes, and offers the following separation options:

- ICC Profiles
- SPP-ICC Profiles
- SPP-Separation Tables

### ICC Profiles

ICC profiles are color conversion tables that describe the color gamut of specific output devices. This menu offers a complete list of all CMYK profiles located in the ColorSync folder. The user is free to designate which profile to use in the conversion process.

ScanPrepPro will load the selected profile prior to the CMYK conversion process so that the resulting color separation will reflect the color gamut specifications of the profile.

### SPP-ICC Profiles

ScanPrepPro’s highly respected color separation tables have been carefully transposed into ICC profiles. For those desiring to use ICC profiles, but also desiring to continue using ScanPrepPro’s separation process, this option is a very valid choice.

When a specific paper and press combination are selected from the main dialog, and color separation is chosen from the Desired Result menu, ScanPrepPro will automatically load the proper SPP ICC profile.

### SPP Separation Tables

This choice is for those desiring to continue using our traditional color separation tables. When a specific paper and press combination are selected from the main dialog, and color separation is chosen from the Desired Result menu, ScanPrepPro will automatically load the proper SPP color separation table.

The default setting for the Color Separations menu is “SPP Separation Tables.”