# Digital Color Management for Print and Press

Fundamentals

Strive for 90% rule. All monitor images, and all images between individual monitors and print stage, should be 90% similar. All proofs, press proofs and monitor images should not vary more than 10% in color and density – for the entire workflow.

Obtain or create ICC color profiles for all hardware, software, and materials: scanners, monitors, application programs, printing papers and inks, printing presses, etc. For Epson printing, many Epson and third party profiles for papers and inks can be downloaded from Epson.com

Understand color theory and the differences between RGB (monitor display, additive color) and cmyk (printed page, subtractive color.)
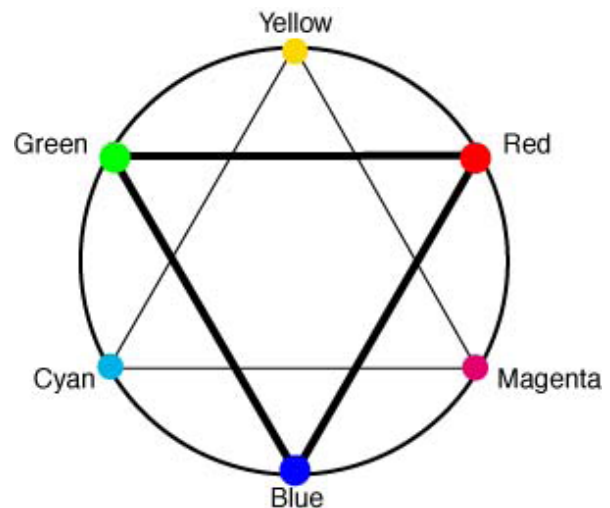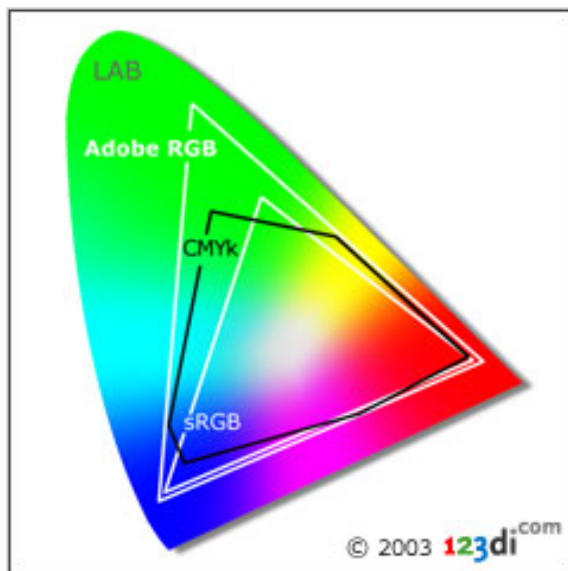
Workflow Procedures

1.) Calibrate monitor. Preferably with a hardware device (Color Eyes, Gretag-Macbeth). This is the most important step for consistent results throughout the workflow. Make certain gamma and color space are consistent with your output or preferred monitors for web display. Rule of thumb: Make macintosh images 10% lighter and PC images 10% darker to "split" the difference between standards.

2.) Set color space and print/web defaults for all software and capture devices. Adobe RGB preferred. In Photoshop, editt>color settings, use North American prepress 2. Set rendering intent to perceptual. In InDesign, edit>color settings,. Adobe Acrobat Prof, use preference panels. For

digital cameras, set color space when possible to Adobe RGB. When in doubt, for press jobs ask printer or designer which settings are optimum for their equipment.

3.) Edit image in Photoshop in RGB color space for artistic purposes, for content, communication and meaning, for color and tonal correction, and for subjective enhancements. Use non-destructive editing procedures to preserve pixel depth and quality, and when possible, use 16-bit color.

4.) Save image in RGB mode. Do not resize or change pixel dimensions (resample). This is your integral image, that you may change in different ways for particular output or web purposes.

Prepress procedures for print/web

5.) Load ICC color profiles for hardware, printer, paper and inks. If going to press, convert image to CMYK color space. If going to web, re-size and resample image for monitor display – keep in RGB color space. For Epson printers, stay in RGB mode and allow the printer to make the CMYK conversion.

Note: All monitors and output devices have imaging characteristics of their own that must be taken into account to make sure that they produce the correct results. An ICC profile is associated with each output device – and paper/ink combinations -- to describe how the colors need to be transformed to produce accurate results.

Achieving consistent and accurate color requires that both input colors and output devices be profiled against a standard color space. ICC profiles allow you to proof images on-screen with the same color characteristics of your printer or output method.

6.) "Soft-proof" your image in PS or in Browser. In PS, View>proof setup and load ICC profile for output method. Make test print or obtain press-proof from printer – using your file -- to verify "soft-proofing" and monitor accuracy. Make adjustments as needed. The entire industry, except Microsoft, treats 1.8 gamma (density range) as the preferred gamma for print work, and 2.2 gamma for web/monitor.video display. All PC monitors use 2.2 gamma. A color temperature of 5500 – 6000 K is the correct white point balance for print work. Web display is generally much lighter as the trend in consumer preferences is for lighter monitor displays.

7.) Re-adjust color and tone in image for CMYK conversion and for "soft-proofing" results. This should get you 90% there to the printed piece. Save image with notation of printer and inkset (i.e Epson 7600, Ultrasmooth paper, etc.).

8.) Make final small adjustments to color and tone from press-proofs or workprints. On Epson printers, and most presses, small prints are exactly the same in color and density as large prints. For economy and time, make small proof prints prior to making final print.