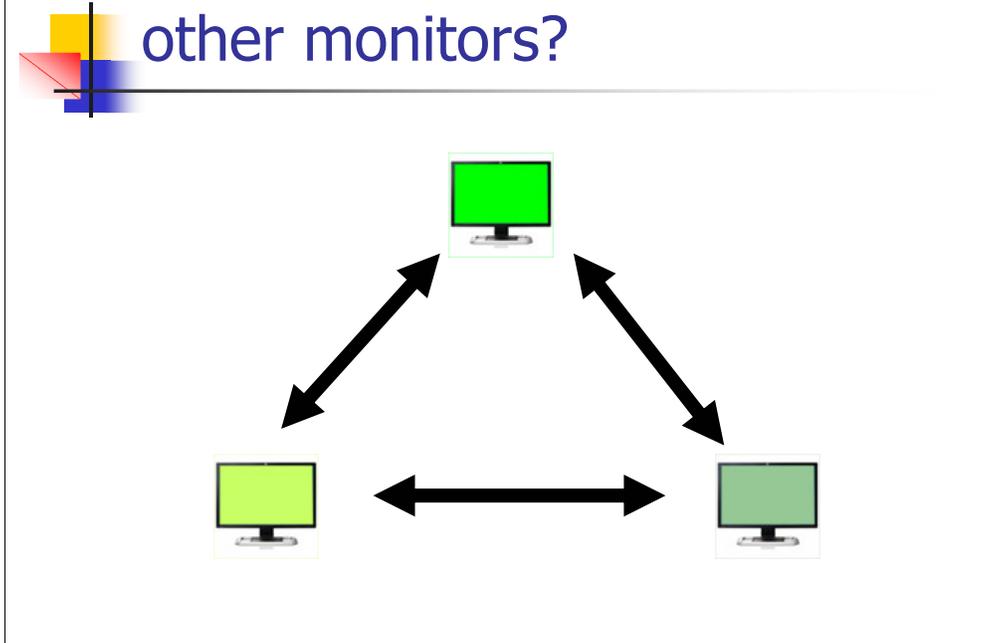


Getting the Colors you Want

**PRACTICAL  
COLOR MANAGEMENT**

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April 12, 2010

## Does your monitor match other monitors?



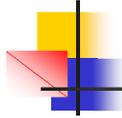
Before describing the methods for using Color Management, it's useful to understand the problems that Color Management is meant to solve.

The first of these problems is that colors, when displayed on different, non-calibrated and non-profiled monitors, are not rendered identically. Instead the green on your monitor is more yellow on a different monitor or less vibrant on a third.

If each monitor is calibrated and profiled to display standard colors then the green, or any other color, is rendered identically to the green on other monitors.

Color management may also be applied to digital projectors to ensure that the colors displayed on them match the colors rendered on a calibrated monitor.

## Does your printer match your monitor?

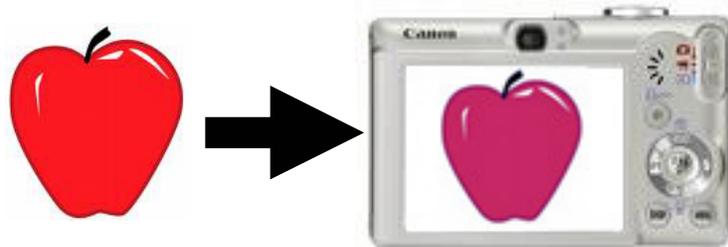
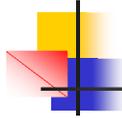


Once the monitor has been calibrated and profiled so that conforms to color standards, then the photographer will want to make the colors rendered by a printer conform to the colors on the monitor.

Color Management offers methods for applying color adjustments to images sent to a printer so that the colors rendered in a print match the colors displayed on the monitor. These adjustments are known as printer profiles.

Most high quality photo labs, including Costco, provide color profiles for their printers that may be used to ensure accurate color reproduction.

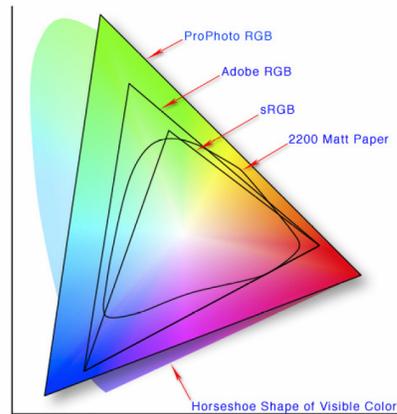
## Does your camera match your subject?



The last problem discussed here is less severe, but becomes more severe when accurate subject to image color matching is necessary. Digital cameras do a wonderful job of color rendition but each camera has a built-in color bias. The bias varies from one camera manufacturer to another and may also vary from one individual camera to another, even if the cameras are the same make and model.

Just as output devices (monitors and printers) may be profiled, so may input devices (scanners and cameras). A technique for developing a camera profile will be described here, although scanner profiling will not be illustrated.

# Color Spaces and Gamut



- Gamut – the range of colors that can be represented in a particular color space.

Some necessary background –

The lower contrast color cone in this image represents colors that may be seen by the human eye. The triangles represent the most popular color spaces used in photography. The bigger the triangle, the more visible colors it contains.

A color space is a mathematic model that defines how the colors inside the triangle are represented digitally. The broadest of these color spaces, the color space with the largest gamut, is the ProPhoto color space. If you shoot raw, this is the color space you should use. The AdobeRGB color space is contained within ProPhoto, and sRGB is within AdobeRGB. Even though sRGB has the smallest gamut, if your image is destined for the web, use this space. The web is built around sRGB, and your images are rendered best on the web when they use this space.

The rounded triangle represents the color gamut of a typical printer. Note that all other color spaces contain colors that do not fall within the printer's gamut.

## Profile your monitor

Place the colorimeter on your monitor, then start the Measurement software.



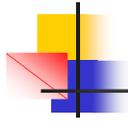
### Step one – Profile your monitor

To do this job right you will have to buy some additional hardware call a colorimeter. You'll get some software along with the colorimeter. Use the software, and the colorimeter together to create a profile for your device.

The process takes a few minutes during which the software displays red, green and blue colors of varying brightness and intensity. The colorimeter measures the displayed colors to determine the degree of difference from the expected result. The table of difference that the software and colorimeter accumulate is used to produce the color profile that may be applied to your monitor to bring it into standard.

Monitor should be re-profiled regularly since all monitors drift and their colors shift over time. Drifting is less severe for newer, flat-panel LCD monitors than for old style CRTs but all monitors drift.

Many, but not all, colorimeters may also be used to profile digital projectors. Check the specifications of the colorimeter and software if projector calibration is important.



## Find a profile for your printer

- Find the right profile for your printer, and paper, from the printer manufacturer,
- The photo lab, or
- Develop a custom profile

By far the easy way to make prints whose colors match the color on your monitor is to use a profile supplied by your printers manufacturer. Profiles are specific to a particular printer model, and to the paper type that is used. The profile for Epson Premium Glossy used on an R2880 differs from the profile for Epson Premium Luster used on the same printer.

These profiles are built with some important assumptions –

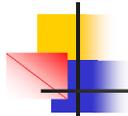
-The ink used in the printer is the ink made by the manufacturer for that printer model

- The paper used is paper, made by the manufacturer, for use in that printer model.

If either of these assumptions is violated, you are not likely to get the results you expect.

Many photo labs supply printer profiles.

If you wish to use non-standard inks or papers, you may elect to develop custom profiles for your printer.



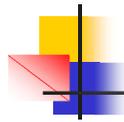
## Profiles from the manufacturer

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- Download profiles for your printer/paper from the manufacture
  - [www.espon.com](http://www.espon.com)
  - [www.hp.com](http://www.hp.com)

The software that came with your printer should have included profiles for it. In some cases the profiles are updated, or the profiles supplied do not include all of the paper types supported.

Check the manufacturer's website for updated, or missing, profiles.



## Profiles for the lab

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- Profiles for Costco and a few others
  - [www.drycreekphoto/icc](http://www.drycreekphoto/icc)

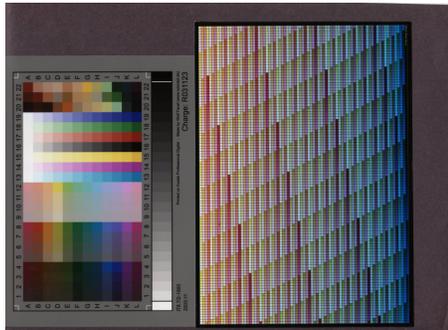
Many photographers use Costco for prints. You can find profiles for the Costco printer nearest you via a link from their website, or by going to Dry Creek Photo directly.

Note that the Costco links take you to Dry Creek.

The Costco profiles are updated regularly, so make a habit of always downloading the latest profiles before printing a Costco.

## Custom Printer Profiles

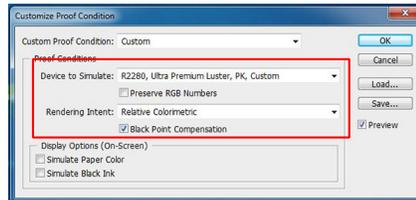
- Profile Prism (\$79)
  - [www.ddisoftware.com](http://www.ddisoftware.com)



The presentation will include a short demonstration of the use of the Profile Prism software to create a custom printer profile.

Information about the program may be found at the manufacturer's website.

# Softproofing in Photoshop



- View>Proof Setup>Custom
- Demo

Once you have selected the best printer profile, use it when making color adjustments to your image.

Start by turning on a feature called Soft Proofing. To soft proof, start Photoshop CSx, then click View>Proof Setup>Custom.

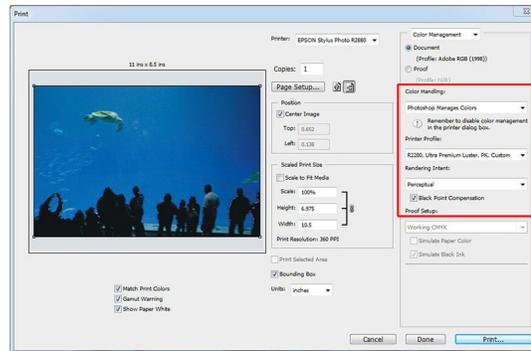
**IMPORTANT** -- Make certain that the “Preview” checkbox is checked.

Use the dropdown box to select the printer profile that matches your printer and paper. Notice that as you change profiles, the image onscreen changes to model the appearance of the image if it were printed.

The “Rendering Intent” dropdown tells Photoshop how to handle colors that are outside the printer’s gamut. In general, you should use either “Perceptual” or “Relative Colorimeter”. Watch the image on screen as you switch between these two. You will likely see only subtle changes. Pick the rendering intent that gives you the onscreen appearance you like best. Remember that soft proofing presents a view onscreen that will match the appearance of the image when printed using the selected profile.

# Printing in Photoshop(1)

- The Print dialog – Photoshop Manages Colors!!



The next two steps confuse lots of people, and if done incorrectly will give prints with unpleasant colors.

Click Print. In the large dialog box that opens, make certain that “Color Management” is selected in the upper right dropdown, and that “Document” is selected below it.

Now for the most important part – under “Color Handling” make certain that the first dropdown says “Photoshop Manages Colors”, that the printer profile matches the profile you identified earlier and used for soft proofing, and that you select the rendering intent that matches the intent used for soft proofing.

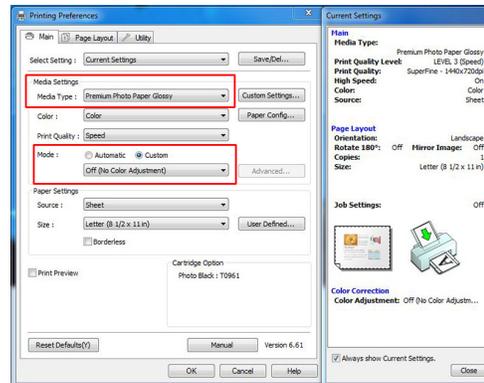
Unfortunately, Photoshop Elements does not offer soft proofing.

**RECAP – LET PHOTOSHOP MANAGE COLORS AND USED THE RIGHT PROFILE!!**

That’s step 1.

## Printing in Photoshop(2)

- The Print Driver dialog – turn off color management!!



Now that the printer dialog has been setup correctly, its time to set up the printer driver. Leave the print dialog open, and click “Printer Setup”.

The dialog that opens will verify from printer to printer and from OS to OS, but the dialog should have several important features in common.

-The dialog will apply you to select the paper type you are using. This selection must match the paper.

-The dialog will give you the option to select color management settings.

**IMPORTANT - YOU MUST TURN OFF COLOR MANAGEMENT IN THE PRINT DRIVER!!**

Note the line above. Only Photoshop manages color. Not Photoshop and the printer. Not the printer alone. Just Photoshop. By itself.

That’s the tricky bit. Many people forget this part and leave color management on in both places.

The process is similar for Photoshop Elements.

**RECAP – LET PHOTOSHOP MANAGE COLORS. TURN OFF COLOR MANAGEMENT IN THE DRIVER.**

## Camera Profiles

- Photograph ColorChecker
- Download DNG Profile editor from Adobe --  
[labs.adobe.com/wiki/index.php/DNG\\_Profiles](http://labs.adobe.com/wiki/index.php/DNG_Profiles)
- Start the Profile editor and open the ColorChecker Image



If you're a raw shooter, and you're so inclined, you can create a custom profile for your camera to make certain that the colors in your images are a true presentation of the colors in your scene.

Frankly this isn't a terribly important thing to do but can give you images that are slightly more pleasing than your camera as is.

You can find information about creating camera profiles by looking at the link on the slide. That's lots more information on the web too, just Google "camera profiles".

I'll demo that Adobe solution during the live demo.