

## COLOR MANAGEMENT BETWEEN CAMERA AND PRINTING

When a camera is used to take a picture the image produced shows the colors involved as close to the original as possible. This is governed by the technical limits of the individual camera.

This image is shown on a computer monitor, again as accurately as possible given the technical capabilities of the monitor.

This image can then be printed by a color printer as accurately as possible given the capabilities and settings of the printer.

As you can see there are a lot of variables for the image that you see before clicking the camera and the one produced by your printer. In order to get the closest possible reproduction of the original by the printer it is desirable to have all the components working as closely as possible using the same rules.

The first thing to consider is your camera. Today most cameras can faithfully reproduce an image to be a close reproduction of the original unless you have a very low megapixel sensor (such as found in some cheap cell phones). Therefore it can usually be taken that the image saved to the camera memory card and subsequently downloaded to a computer is a good reproduction of the original.

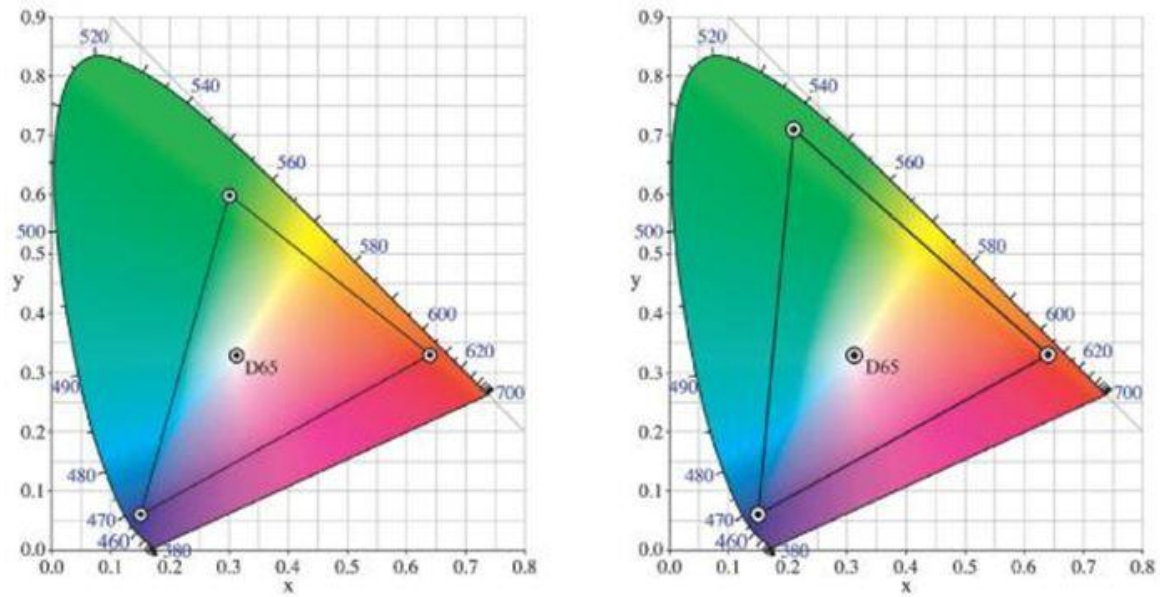
The area of color reproduction for all components is described as the “color space” which is the spectrum of color shades portrayed through red to green/blue and are based around pure white. Cameras, monitors and printers are capable of recording or outputting only a small portion of the total “color space” (sometimes called the “spectrum”) and this is known as the color “gamut” of the device. Colors that fall outside the color gamut of the device are either substituted by the nearest “in gamut” shade available to the device or ignored.

Problems occur when a color is in the color space of the camera but the output device (monitor or printer) has a different color space leading to the color being translated which can give some strange results! It is akin to asking someone to give you a number between one and ten and they answer 15.

It is therefore imperative that to get the best results you should try to match the color space of the image, Photoshop Elements and the printer.

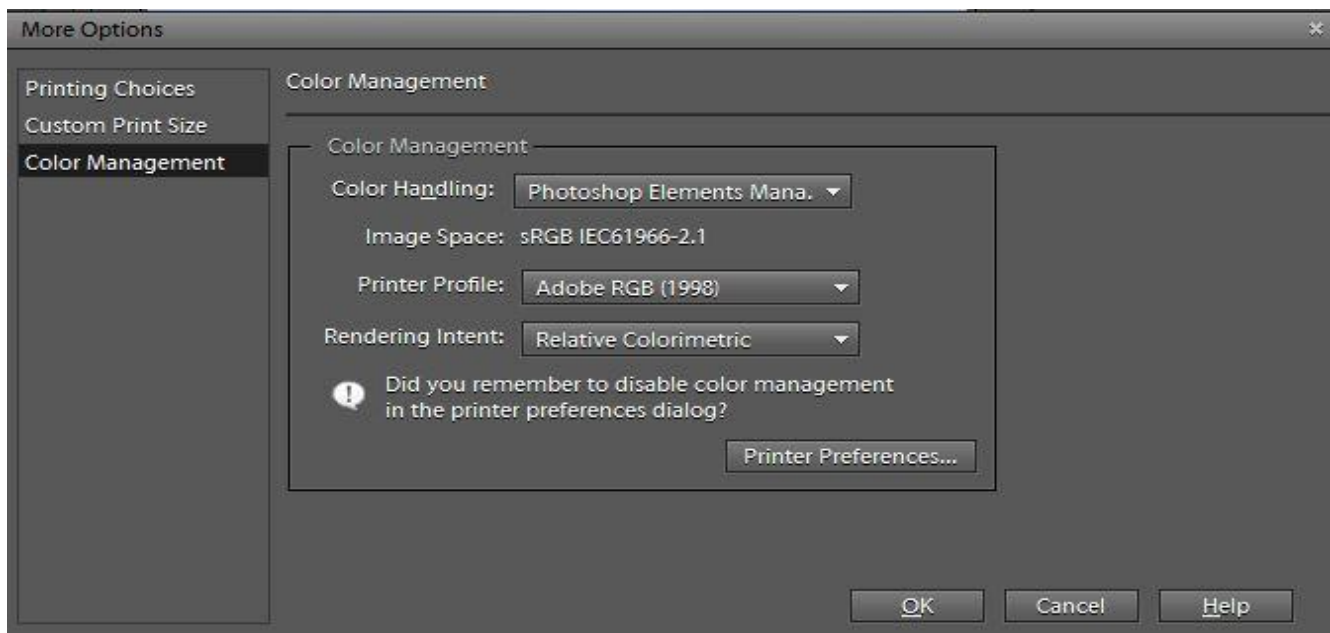
If you have a high end SLR camera it probably has a “color space” setting with two choices, sRGB and Adobe RGB. If you are going to use Adobe Photoshop or Elements for adjusting images taken with this camera choose Adobe RGB.

To give you an idea of the difference between sRGB and Adobe RGB look at this:



This is the D65 spectrum upon which many color profiles are based. On the left is the standard sRGB coverage (color gamut) and on the right the Adobe RGB. As you can see the right hand color gamut is larger meaning it covers a greater range of colors. As long as you are using Photoshop or almost any other image manipulation software using the Adobe RGB will give you truer colors.

In Elements photos can be printed from the organizer or the editor but as there are more options available in editor I will show that scenario.



First go to Edit>Color Settings and make sure that "Always Optimize for Printing is selected".

Make sure you have a photo open and select File>Print to open the print dialog box. Confirm the correct printer is selected at the upper right corner if you have more than one printer and then click on the “more options” box at the bottom and select “color management” to open the box shown above.

Here you can set up the printer to closely match your other settings. First ensure that the color handling is set to Photoshop Elements from the drop down menu. Next check the printer profile. Some printers have a built in profile with the printer drivers you installed (most noticeably with Epson) but if your printer is not listed choose Adobe RGB as the profile. Notice the warning to disable color management in the printer preferences dialog. If you are not sure this is disabled click on the “printer preferences” and check.

Finally select from the drop down menu the “Rendering Intent”. This setting determines how “out of gamut” colors are handled.

Relative colorimetric attempts to map colors “relative” to the original. For most images this will be the best choice.

Absolute colorimetric is normally used in digital proofing to simulate paper color and is not recommended for photo printing.

Perceptual rendering is sometimes known as “photographic”. Colors at or near the edge of the color gamut will be “pulled” into gamut. This can produce pleasing results especially with color transparencies.

Saturation will “pull” saturated colors thereby increasing the color strength or saturation. It is intended for vector graphics such as line art, logos etc. and should not be used for photographs.

If you follow these simple guide lines the images you see coming out of your printer should be closer to the images you see on your monitor.

However you should consider calibrating your monitor on a regular basis. I use a “Spyder” calibrating unit which is quick and simple.