

Color Calibration and Preparing Images for the Web

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What is color management?

Color management is a system for displaying visual information so that different devices will display the same image with accuracy. As we move from original image, scanner, monitor, color printer, final press sheet, and the web matching colors and tonal values becomes important. There are numerous factors that will skew the appearance of the image. Having a good color management system in place will insure that you image is viewed the way you intended.

Why do we need color management?

Two monitors in the same studio and roughly the same lighting conditions may, and often do, display the same image in different ways. This is the same for two identical ink jet printers. In fact, when you change an ink cartridge in your printer you may also get slightly different results. This is also true for digital cameras and scanners which vary in their sensor technology. All devices will also shift over time as they age.

The best way to bring all your devices into sync is to use a color profile for each device. The device profiles come in a variety of forms and are device-specific color information that is a characterization of a device's color rendering and reproduction capabilities. Monitor profiles, scanner profiles, and printer profiles are utilized in a color management system such as Apple ColorSync to help the devices communicate color information with each other.

Profiles are can be created for each device in your studio using a color calibration system such as **Pantone Huey**, **Gretag-Macbeth/X-Rite Eye-One**, **ColorVision Spyder**, or other similar system. Using one of these systems you will be able to create profiles for your Monitors, scanners, and printers and insure color accuracy between them

In the case of offset printing we don't have access to the press to create a custom profile, so we must rely on industry standard profiles such as **U.S. Web Coated (SWOP) V2**. All printing houses calibrate their systems to this standard and thus we can be generally insured to get good color results when we go to press.

Color Profiling products

- *Pantone Huey*
- *Gretag-Macbeth Eye-One*
- *ColorVision Spyder*

Last but not least is the web, which unfortunately for photographers has no color management system. The closest we have is the **sRGB profile**, also called “Stupid RGB” because it is essentially a non-profile. It is what an image is left with once all the profile data has been stripped away. The computer industry has adopted this profile as the standard default color display mode for all browsers and computer displays. Though it sounds like a breakdown in the perfect world of true color management, it actually works reasonably well. If an image is retouched and converted to sRGB before placing on the web you will get generally good results. Where the system fails is when an end user has their monitors contrast set too low, or they are viewing on a laptop in bright conditions, or their monitor is going bad. These are all conditions that are obviously beyond our control.

Where color management really pays off.

Devices:

Digital Camera

Scanner

Monitor

Ink Jet Printer

Offset Printing

Web/Screen

Broadcast Video (TV)

When we send files for offset printing and for digital enlargements we no longer have control over the production of our images. There is an unbelievable amount of variables involved as we prepare images for an Ink-Jet printer, or offset printing, for the web or screen, and even for broadcast. But if we adhere to industry standards for color management our images will most likely come back looking great.

Background on Color Spaces and Color Profiles

Color Space:

A system for describing color numerically.

Color Profile:

A map which describes specific details of a devices color space. Color profiles are usually device specific.

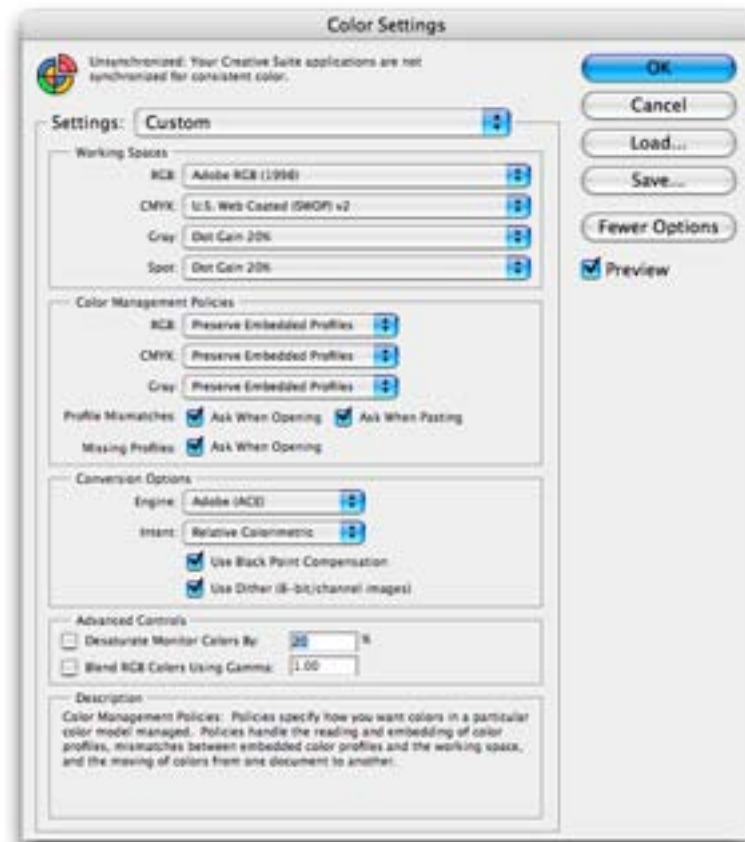
A color space can be defined as a system for describing color numerically. The most widely used color spaces are RGB for scanners and displays, CMYK for color printing and YUV for video and TV. A color profile is essentially a map that is specific to a particular device and describes the devices color space. Using this map an application such as Photoshop can convert the image information to be best displayed on a specific device

Color Profiles and color spaces are often described in terms of gamut, which is the entire range of colors available on a particular device such as a monitor or printer. A monitor, which displays RGB signals, typically has a greater color gamut than a printer, which uses CMYK inks. When a color is “out of gamut,” it cannot be properly converted to the target device; for example, to a different type of printer.

Adobe RGB (1998) is the color space of choice for photographers because it offers the widest gamut. Even though all the colors may be out of range of your monitor or printer, there is comfort in knowing that the information is not lost.

Color Settings in Photoshop

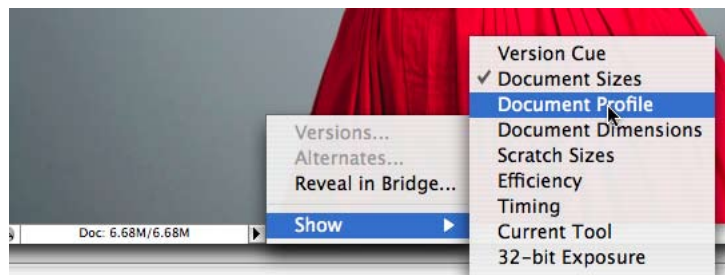
Choose Edit>Color Settings to get the following dialog. Be sure that your settings match these. Click on the More Options button to get the extended information.



These settings are a good place to start, though some photographers have their own preferences. The Color Management Policies, for example, are designed to alert you when you open a file that is not in the working color space. Some people find this annoying.

Also, since we will be making liberal use of the Edit>Convert to Profile dialog, it is also not essential that our working space is Adobe RGB(1998).

To help identify the color space you are working in for a particular image it can be useful to set the indicator in the lower left area of work space to display your current profile:



Prepping Images for the web

File requirements for the web:

- Size to fit your required pixel width and height.
- Set resolution to 72 dpi.
- Convert file to sRGB.
- Save at the highest quality as a JPEG.

Begin with your original retouched and color corrected image files. Generally you would have followed these steps to get this far:

- Scanned an image or shot it digitally.
- Converted the image from your scanners profile to Adobe RGB (1998) or your digital camera should have been set to shoot in Adobe RGB (1998)
- Scanned your image at 300 DPI or keep your image in the native resolution of your digital camera (there are options for “res-ing” an image up).

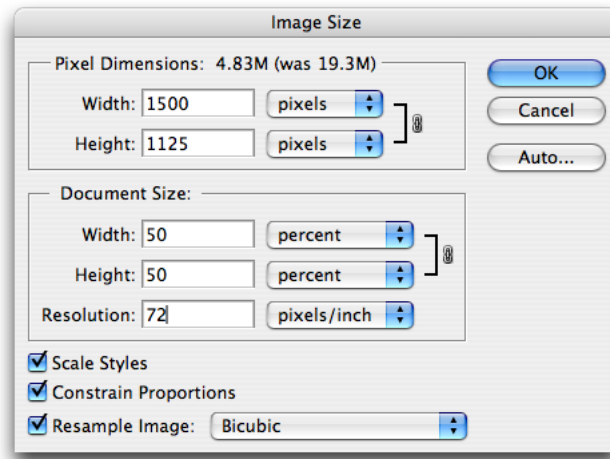
Do all color corrections in Adobe RGB (1998) and use Edit>Convert to Profile if you are not already in that space. **Please note that you have to set the profile for every image.**



When you are happy with your image and are ready to prepare it for the web be sure to save the original file as a TIFF, PSD, or lossless file format of your choice.

Steps to save for web:

- 1) Use Image>Image Size to reduce the image. Reduce by 50%.



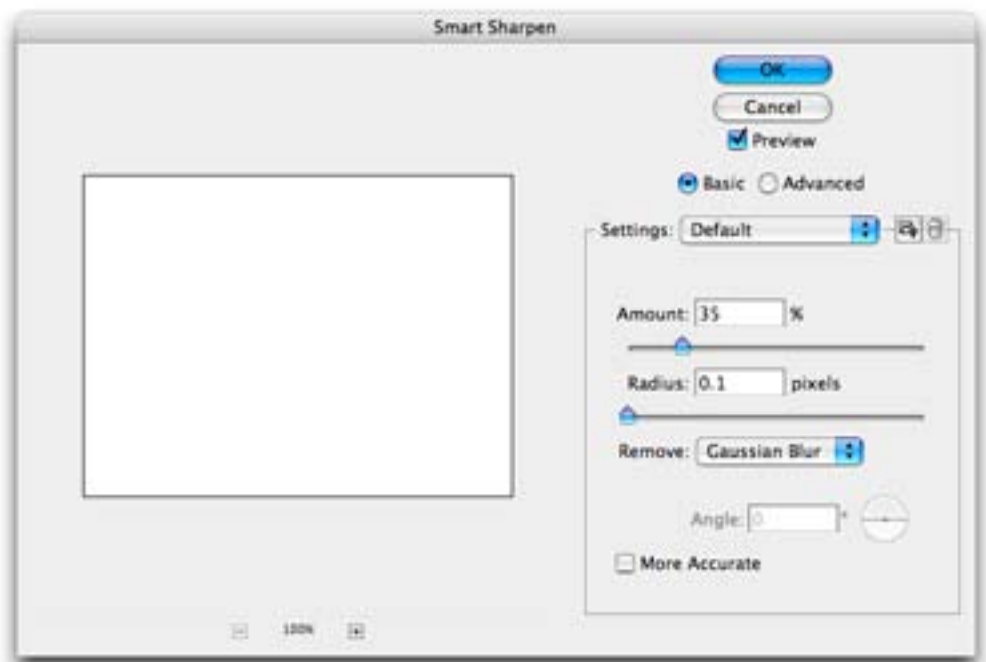
Smart Sharpen using:

Amount: 35%

Radius: .03 - .05

Apply multiple times and use Undo and Redo or the history palette to find the sweet spot.

- 2) Apply Filter > Sharpen > Smart Sharpen using:

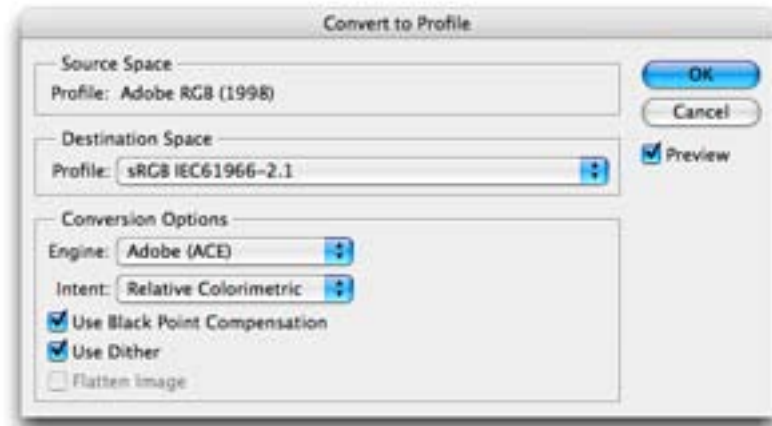


3) Continue with steps 1 and 2 until you reach desired sharpness and size. Your final image for the web should be 72dpi.

File requirements for the web:

- Size to fit your required pixel width and height.
- Set resolution to 72 dpi.
- Convert file to sRGB.
- Save at the highest quality as a JPEG.

4) The final profiles of all your images should be set to sRGB so use Edit > Convert to Profile



5) Use Edit > Save For Web or simply use Edit > Save As to save as a JPEG with a quality of 100. **Be sure to not save over your original file at this point.**

Your images are ready to be uploaded to your site.