

Colour Management in Photoshop & Elements

Spelling of the word 'colour'. Throughout this document the word colour has been spelled in accordance with English unless reference is made to a dialog box where the spelling is American English (color).

“Why don't my prints look like the image I see on screen?” is a frequently asked question by digital photographers. The answer is simple; the lack of colour management. Although the answer is simple the solution requires some explanation.

All devices capable of displaying colour: Digital cameras, monitors, printers, scanners, televisions etc interpret colour independently. They are all 'device specific' regarding the way they handle colour. An appropriate analogy is a TV showroom where a row of TVs all showing the same broadcast station will display colour differently. This is because they are each interpreting the colour independently, in accordance with their built-in settings. The colour will usually be 'corrected' when you get the TV set home and tweak the colours to your own taste. This is a basic form of calibration.

For digital photographers the solution is not quite that simple because setting up the monitor is only a part of the solution. (See the Summary for more on monitor calibration) The output device (usually an inkjet printer) needs to be set up (Profiled) for whichever papers are being used as well as ensuring that the image has an embedded profile.

Newcomers to digital photography occasionally believe that profiling and colour management in general is too difficult or something that only professionals do. Not so; colour management is something that all digital photographers should be aware of and mastering it is no more difficult, and often easier, than many other aspects of digital imaging.

Those new to colour management might wonder exactly what a profile is and how it is used. A profile is quite simply a description of the way a device handles colour. It's a label or a tag that is embedded into the device to provide a description of its behaviour. For instance an image with an embedded profile is considered 'tagged' and an image that does not have a profile embedded in it is considered 'untagged'. For a more comprehensive introduction to colour management and the profiling process please contact Fotospeed and request a copy of the document 'An Introduction to Colour Management'.

In order to implement a colour managed workflow at least two profiles are required; input and output. First, the image file must have an embedded profile; the input profile. Second, the paper being printed on should be profiled to the printer; the output profile. Also required is a colour management module, which is built into Photoshop. The colour management module 'translates' the information in the input profile to the output profile ensuring that integrity is maintained. Although two profiles are the minimum required, in order to manage colour effectively and efficiently a third profile is also required. This comes about as a result of calibration of the monitor. A calibrated monitor is the only way to guarantee that the colour you see on screen is an accurate rendition of the information in your file. An uncalibrated monitor cannot be guaranteed to display accurate colour.

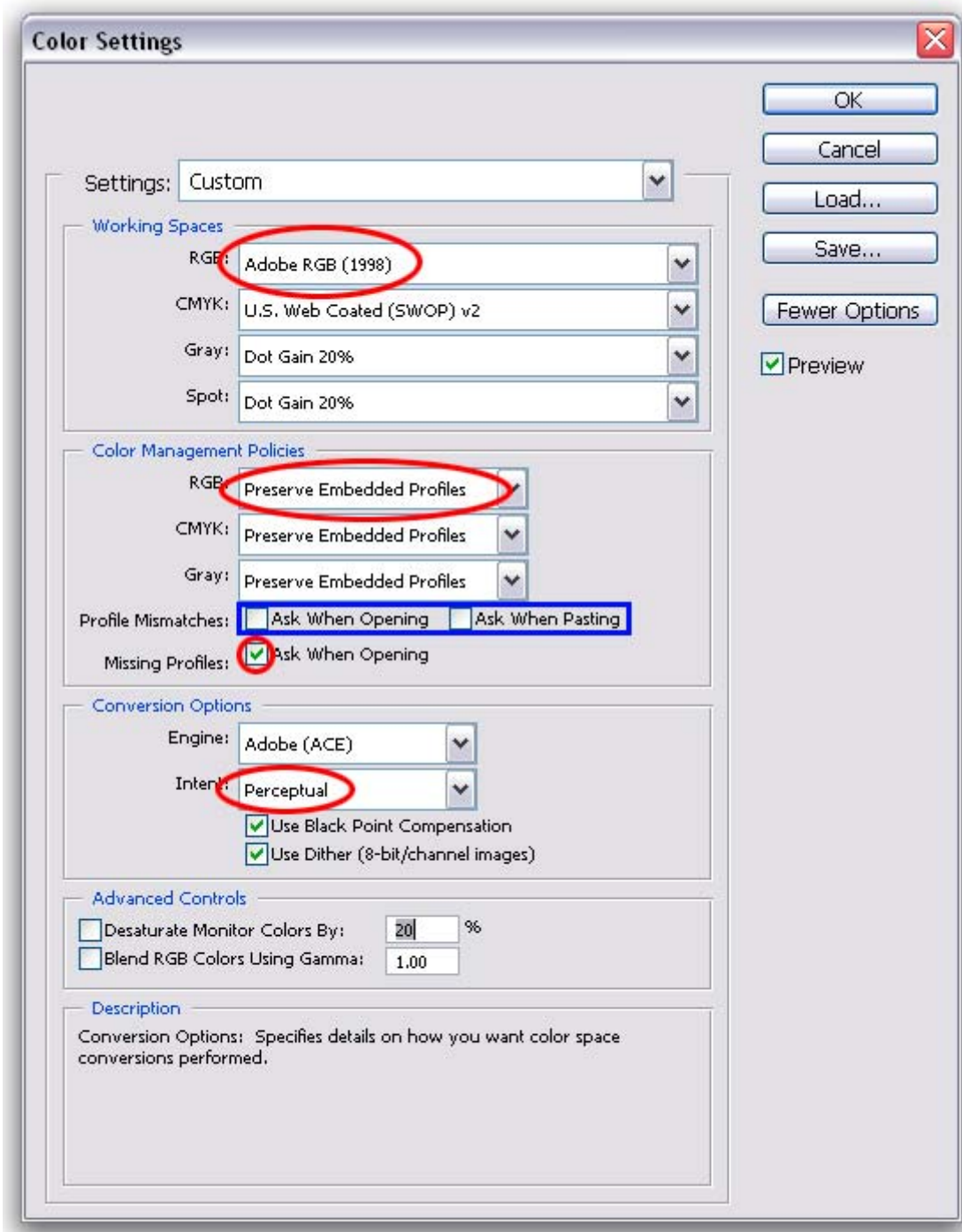
Although colour management can be a complex subject I have tried to provide a very simplistic description of the process as, in this instance, this is all that is required in order to provide an introduction to the subject and give a basic understanding of the process of setting up Photoshop and how to go about getting papers profiled.

Setting Color Policies in Photoshop

In order to manage colour correctly it is necessary to set up your colour policies correctly in Photoshop. This is a quick and simple procedure and once set can be left alone.

To set up your colour policies on a PC go to Edit > Color Settings. Mac users will find the Color Settings folder in the Photoshop menu. The dialog box shown below will appear.

If you have not set up your policies previously you will probably find that they are set to 'North American Prepress' settings. Adobe has to set something as a default and this is the setting they use, but it is not what we want. The recommended settings are shown. Explanation for the choice of settings is shown on the next page.



The 'Settings' area contains a number of presets. Select Custom.

Ensure that 'Advanced Mode' or 'Fewer Options' (towards the top right) is set depending on which version of Photoshop you are using. This will give you access to the full dialog box.

Next, set up the 'Working Space' area. Clicking the RGB box will reveal the list of profiles that are installed on your computer. There are various options available and the choice to set is will be dependent upon your working practice. If your capture mode is sRGB then you should select sRGB as your working space. If you shoot in RAW then the options are increased. If you are unfamiliar with colour management it is recommended that you select Adobe RGB 1998. This is a reasonably wide colour space, wider than both the monitor and inkjet printers – but not by too much. There are other options available in the list but until you develop an understanding of colour management it is probably best to leave those alone. The Working Space option is discussed more fully in 'Image Colour Space Options' further on in this document. If you are unsure what to set, read that paragraph first as it may assist in reaching a decision.

The CMYK, Grey and Spot settings can be left at their default. Although you will be printing to an inkjet printer, which uses CMYK inks the data must be sent in RGB. The printer does the necessary conversion.

Next, set up the 'Color Policies'. As with the Working Space the prime consideration here is the 'RGB' selection. There are 3 options: Off, Preserve Embedded Profile and Convert to Working RGB. Clearly Off is not an option because we want to colour manage not switch it off. Of the 2 remaining options the choice is yours but the recommended option is 'Preserve Embedded Profile'. The reason for this recommendation is that if your camera embeds a profile into your image when it is captured then you can continue to use that profile throughout the Photoshop process. The image profile is a description of the captured colour so you might just as well continue to use it.

As with the Working Space you can leave CMYK and Grey as they are, if you wish.

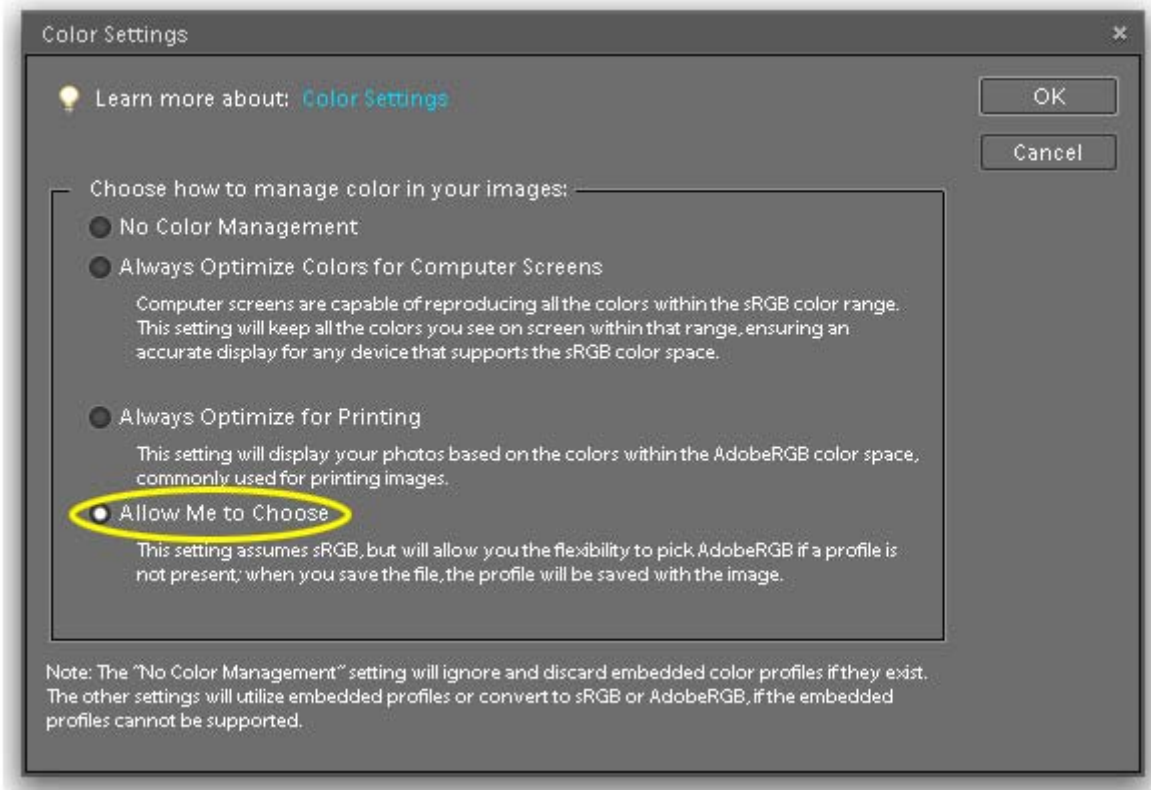
At the bottom of the Color Policies area you will find 3 checkboxes. The area outlined in Blue indicates profile mismatches. Checking, or leaving unchecked, these boxes will depend upon your workflow and whether or not you set a different working space to what your camera captures. Checking them will mean that every time you import an image that has a different profile to your working space a warning dialog box will pop up letting you know that. The same would be true when merging documents of differing profile origins. If you do not want to be bothered with this warning leave boxes unchecked.

Underneath these 2 boxes is one further box – 'Missing Profiles'. It is essential that this box is ticked. This will ensure that whenever you open a file that does not have an embedded profile a warning dialog box will pop up offering you 3 options. Usually, you would apply a profile but there is one specific instance when you do not and that is when printing a test chart for profiling. The chart is an Untagged RGB file and it is essential that it remains that way. So, in this instance you would select 'Leave as is (don't color manage)'

In the Conversion Options leave Adobe ACE as the engine. The rendering intent is the part of colour management that looks after those colours in your images that fall outside the gamut of your colour space. There are 4 options, only 1 of which is recommended. Select Perceptual. Although Relative Colorimetric is an option that could be used, Perceptual is recommended where an inkjet printer will be used for output due to the way out-of-gamut colours are brought into gamut.

Setting Color Policies in Photoshop Elements

Setting colour policies in Photoshop Elements is a simpler process than in Photoshop. All that is required is to select one of the options in the Color Settings dialog box which is found within the Edit menu. Earlier versions of Elements present fewer options than the later versions (5 and 6) but the selection process is exactly the same.



Of the options presented it is clear that:

Option 1 is not really an option if colour management is the aim.

Option 2 is inappropriate as we are working towards print not screen output.

Options 3 is getting closer and were there not a requirement to print the test chart without colour management then it could be selected.

Option 4 is the most flexible and is therefore the option to select. It allows you to make the decision on whether to colour manage or not and which colour space you want to work in.

Image Colour Space Options

Digital cameras have the capability of embedding a profile into the images they create. By default many of them will be set to sRGB and, quite often, it is the only choice available. More advanced cameras: digital SLRs and some high end compact cameras will allow the option to select Adobe RGB 1998. If your camera does give you the option to select your colour space then you can accept the alternative option – usually Adobe RGB 1998. This will allow you to capture a wider range of colour than sRGB will allow. It is a reasonably wide colour space, wider than monitors and printers are capable of but not by too much. Some cameras, notably Nikon and Canon may well embed their own equivalent of Adobe RGB 1998 (Nikon RGB or Canon RGB). These would be perfectly suitable as options to select. If your camera is able to capture some form of Adobe RGB 1998 then it would be appropriate to select that as your Photoshop working space. If your files will originate as sRGB you

should select that as your working space selection. Expanding from sRGB into Adobe RGB 1998 when importing into Photoshop will not give you access to a wider gamut. Instead it will just stretch the colours already captured to fit the wider gamut. This could be detrimental rather than beneficial and possibly introduce posterisation into your images; particularly in areas of smooth graduated tone. Capturing in sRGB and converting to a wider colour space should be considered bad practice.

Summary

The purpose of this information is to provide some background to colour management and hopefully give newcomers to digital imaging a basic understanding of the process. It is important to consider what we hope to accomplish by making an output profile. In essence we want to 'fingerprint' the output device to ensure that it produces accurate, consistent colour that is in keeping with your image file.

Additionally, it is important to note that profiling your inkjet paper to your printer will only accurately reflect the data in your image file. It has no bearing on the colour that you see on screen. The only accurate way to ensure accurate colour on screen is to calibrate it using a colorimeter or spectrophotometer. Calibrating the screen will ensure that accurate colour is displayed which means that the data in your file will be accurately represented.

You should consider the possibility that if your screen is not calibrated it may well be displaying inaccurate colour. If your paper is profiled to your printer and your screen is inaccurate you may well edit your file and introduce a defect (colour cast?) rather than correct one, which will then result in incorrect output. If your screen is calibrated and your paper is profiled to your printer then you will be able to produce on paper pretty much what you see on screen. However, bear in mind the differences in technology mentioned at the beginning of this document – transmissive and reflective devices – and accept that what will be reproduced on paper will never match absolutely .exactly what is seen on screen but you should get as close as makes little difference.

Finally, remember that you can always call us for assistance for you colour management queries should you decide to use the Fotospeed colour management service.