

Colour Management

An introduction of how it works and what it can do for you.

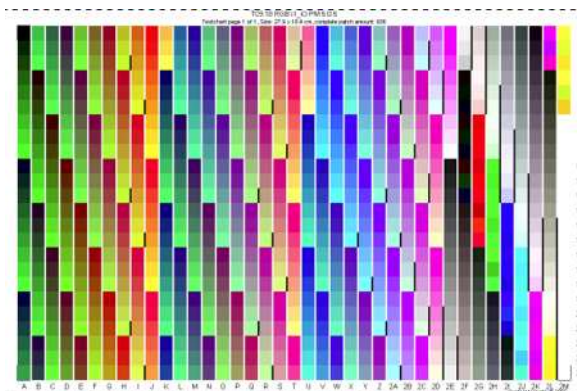
Colour management can be complicated at first glance it appears an expensive, very dull and scary thing to have to get involved with. All of this can be true but it need not be the case. A little bit of familiarisation with nomenclature and equipment and some perseverance can reap huge rewards in your printed output.

The main objective for most inkjet users is to be able to get on paper what is seen on screen, accurately first time and every time. You do not need to be an expert on colour management theory to achieve this, just a few hours effort and you will start to regain back any costs involved from savings such as wasting ink and paper on test strips and bad prints. You really can be in a position to press the print button and leave the printer to get on with it knowing that you will get the expected result. The big bonus is no more frustrating time wasted in front of the computer.

To do all of this requires the use of ICC profiles. ICC stands for Independent Colour Consortium, an organisation set up by suppliers of hardware and software for the graphic arts industries that have initiated the development and standardisation of a colour management system independent of suppliers and platforms and it works. A profile essentially maps how a device interprets then subsequently represents colour data whether it is a monitor, printer, scanner, camera or any other device. In order to achieve this it is necessary to be able to compare how a device represents known colour values. These known colour values are the imaging industries benchmark, the cornerstone of colour management... CIE-LAB Colour.

CIE-LAB Colour is a colour space that theoretically describes all the colours that the human eye can see. It is a huge colour space that goes far beyond what any device can record or represent and so there are no problems with gamut limitations. If you open Photoshop and click on MODE you will see the LAB Colour space listed along with RGB and Greyscale etc.

The main reasons that cause variation from the Lab standard in what you see on your monitor or in your prints are: your monitor, your printer, the paper you print on and the ink you use. In order to colour manage your printing you will need two things, a profile for your monitor and a profile for your printer. Profiles for these devices will allow the data coming from your computer to be reproduced accurately. To achieve this all we need to do is find out how each device actually represents a sample of known colour. We do this in the case of the printer by getting it to print out a colour test chart from a file of known colour values as shown below.



By doing this and analysing the result will show by how much the printer varies from the correct reproduction of these given colours. The printed chart is scanned using a Gretag Macbeth or similar device and the data generated is compared for variations with the known Lab Colour standard are then compiled into a custom piece of software. This new piece of bespoke software that provides these corrections for every colour is your printer profile.

A similar procedure is followed with regard to a monitor profile. A colour sensitive instrument is hung in front of your monitor screen and the software supplied with it flashes a series of colours of known values at it. It reads the way that the monitor displays these colours and writes a profile for your monitor. This is automatically installed in the correct location in your computer operating system and the monitor can then be described as been calibrated. The main difference between generating printer and monitor profiles is that you will need to buy the device that generates the monitor profile, as this should be renewed on a monthly basis. This is because unlike the elements that make up a print, the paper, ink and printer the properties of a monitor change over time so regular calibration/profiling needs to be carried out.

So there we are, now we have a monitor and printer that are calibrated to the same standard therefore what you see on the screen should be what appears out of your printer. There will always be limitations; the most obvious one being that the image on your monitor is generated by transmitted light and the one in a print is generated by reflected light. There are also issues regarding colour space and gamut but soft proofing in Photoshop will allow you to preview these. However this is as far as most people ever need to go regarding colour management. Beyond keeping your monitor profiled, unless you change one of the variables such as a new monitor or different ink, paper or printer, you can get on with taking pictures and printing them.

There are many additional benefits to ICC profiling beyond what I have described here. The main ones are to do with workflow, for example if you require a commercial lab to produce prints for you, maybe to a bigger size than you can manage on your own printer or onto a different material, then you can ask them for the profile of their output device/printer. Then by converting your image to their profile on your computer, because you will be both using a monitor calibrated to the same standard, you will be able to preview how your image will appear when they have printed it. You should be able to see any limitations or benefits of their output device, if it is to a silver based material, thermal or inkjet print. This is ICC profiling at its best.

Important note for Windows users: Remove Adobe Gamma Loader from your start up items folder, as Adobe Gamma is likely to conflict with any alternative monitor calibration. And **NEVER** save the monitor profile using an existing document profile such as sRGB or Adobe RGB. If you have never used Adobe Gamma you can ignore these notes.

If you are one of the lucky ones and use Photoshop CS3, Adobe Gamma has been omitted from this program probably for the above reason. CS3 is a very advanced professional program.

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