



When images are moved between different devices and software applications colour changes are inevitable. The use of colour management limits the effects of these changes and allows a more predictable result.

the basics of colour management

Device Limitations

Colours will never match when data is shared between different devices, even two devices of the same make and model are likely to differ. The reason for this is because of each device's processes and shortcomings to reproduce colour. For example a monitor uses a combination of Red, Green and Blue (RGB) dots to display images on screen, where as an inkjet printer uses inks of Cyan, Magenta, Yellow and Black (CMYK) to reproduce the image on paper. The monitor can obviously display a true Red, the printer on the other hand to print Red has to mix together Yellow, Magenta and possibly a little Black, consequently it will be different. The range of colours that any device can reproduce is know as it's 'Colour Space' or 'Gamut'.

When further variables are introduced such as; film types at scanning, or paper types at printing, each with their own colour limitations things can get rather complicated.

To tackle this problem in 1993 the International Colour Consortium (ICC) was established. It's aim was to provide a cross-platform profile format so device profiles can accurately be used to translate color data created on one device into another device's native colour space.

The outcome of this was the development of the ICC profile specification.

ICC Profiles

Just as you might use an interpreter to communicate to someone who speaks a different language, your devices need an interpreter to speak colour to one another and reproduce it accurately. Your systems interpreter is known as it's 'Colour Management Module' or 'CMM'. The CMM uses ICC Profiles to translate colour values between devices and working colour spaces.

An ICC profile contains information on the colour characteristics for the device it was created for. It is a small file that sits between each device and the image data. When a profile is created a target file of multiple colours with known values is scanned, displayed or printed, these are then measured using a spectrophotometer. The associated software then creates a profile for the device taking into account the limitations applied by it's colour gamut, essentially mapping known colours to what are now known to be available colours for that device.

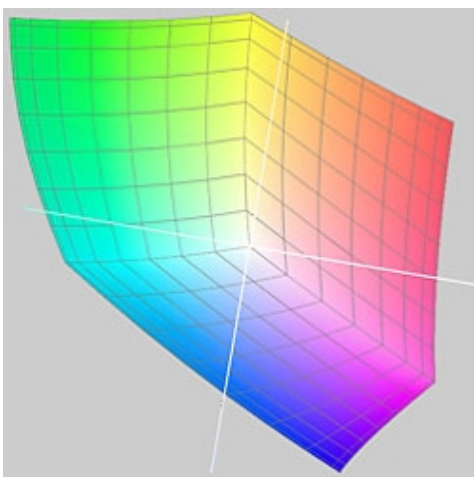
Profiles classes can be 'Input' for scanners and digital cameras, 'Display' for monitors and projectors and 'Output' for printing devices such as inkjet printers, printing press etc.

The CMM uses each profile to make small adjustments to render your image as accurately as possible across different devices.

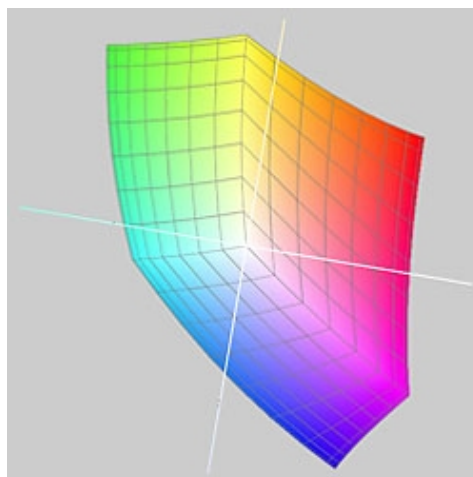
Working Space

When manipulating images in a program similar to Photoshop it is recommended a device independant working space such as Adobe RGB (1998) is used. It is a large enough colour space to encompass the colours used in printing and display your images accurately across different platforms and applications.

In general, while it is a good cross platform colour space, it is not advised to use sRGB as the working space, since it is smaller than Adobe RGB (1998) and may not contain valued colours that can be printed.



Adobe RGB(1998)



sRGB

The above screen shots shown for comparison are from Apple's ColorSync Utility.