

Why do the colours on my screen look so different when printed?

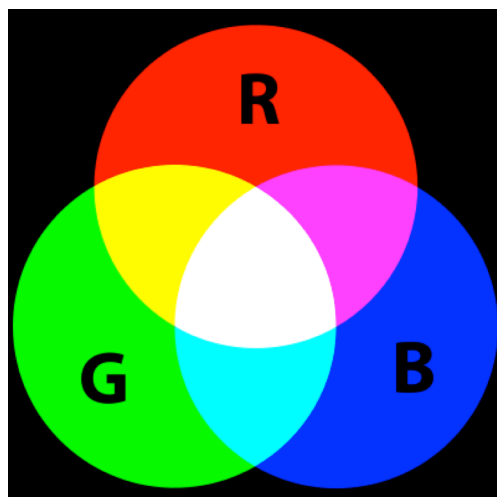
A Basic Introduction to Colour Output Variations

Have you ever wondered why the brochure you designed on your computer looks so different when it comes out of the printer? Or perhaps you've noticed the letterhead you printed on your copier looks different than the letterhead you received from the printers? You've probably wondered, "Why doesn't this look the same?"

This simple introduction is not designed to cover all the technical details of colour output, but to help you understand why some outputs look different and what you can do to minimise the frustration.

Understanding Outputs

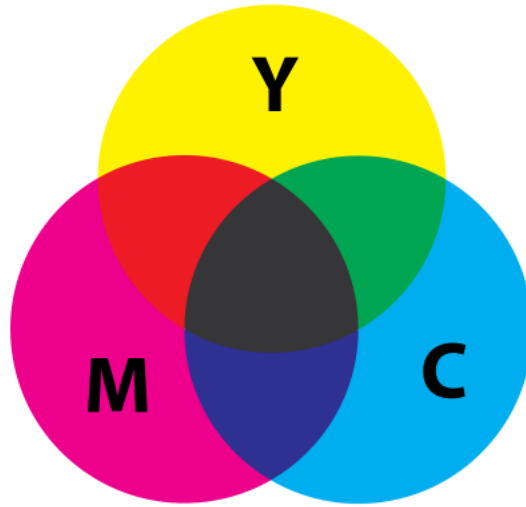
Monitors & Displays



What you see on your HDTV, computer monitor, smart phone or tablet is an RGB display. The letters RGB stand for the colours that are used to display the image on your screen: **R**ed, **G**reen and **B**lue. The pixels in your screen blend those three colours of light together to achieve the resulting myriad of tones, shades and hues you enjoy. Because the colours are made from combined light, all three together make white. On the other hand, the absence of each colour means no light, black. Since adding light together makes RGB colour, it is known as an additive colour model.

Though all monitors use RGB, not all monitors will display them the same. The graphics card in your electronic device and your monitor driver will have a big effect on the actual display of colour. The back-lighting will also change the way colours look. For example, LED back-lighting will look different than LCD or plasma.

Inkjet & Digital Printers



The output of most inkjet printers and digital copiers is referred to as CMYK, which represents the colour pallet they use to render images: **C**yan, **M**agenta, **Y**ellow and **K**black. With these printers, white is derived by the paper itself, while black is either black ink, or the combination of all of the colours. CMYK colour is known as a subtractive colour model because it uses ink to subtract from the light that is being reflected off the paper.

Although most printers use CMYK, each printer driver has unique colour matching methods that renders colour differently. They also have different colour settings that the user can adjust. These settings create thousands of variations and outputs, thus explaining why your page will look different when printed on 2 different printers.

Offset Press

System	RGB	CMYK
FASHION + HOME 18-3224 TCX OR 18-3224 TPX	R: 177, G: 89, B: 163	C: 33, M: 72, Y: 0, K: 0
PLUS Series 2060C (Closest Match)	R: 200, G: 107, B: 168	C: 19, M: 70, Y: 0, K: 0
Plastic	PQ: 18-3224 TCX, PQ: 18-3224 TCX	HTML Values: B16SA3

Items printed on a press may be done in either Process colour (CMYK) or Spot colour. Mixing colours of solid ink together in precise proportions to get a specific colour creates spot colour. The most common standard for this exact colour matching uses 14 base colours and is published by Pantone®. Pantone® is the international standard for precision colour matching.

The three output types listed above should give you an idea why the result from each device will so often vary. Each method uses different fundamental ingredients to create the finished product. Where RGB recreates images using light from three primary colours, CMYK uses ink from four primary colours, and the Pantone® system uses fourteen base colours for mixing.

Is there any hope for a unified colour world?

With all of the advancements in technology, one would hope for a simple solution to make your colour matching woes disappear forever. Sadly, there is not.

Here are some recommendations to make things a little less painful:

1. If you need exact matching, use Pantone®. Otherwise, you should just accept that the colours will be a bit different on each device.
2. If your end goal is a great printed piece, do not worry about what you see on the screen. Print a sample, adjust colours in your program, and print another sample. Repeat until you achieve the desired output.
3. If you have to make sure the images on your screen are going to accurately represent Pantone® printing you might want to consider purchasing a tool to calibrate your display. This device, once set up and calibrated, dynamically adjusts the colours on your RGB monitor as the ambient light in the room changes, resulting in more accurately represented colours on your screen.

A Note About Paper... many people do not take into consideration that the same job printed on different papers may give you a different colour output. We are not talking about different colour paper, but different types of white paper: 100% cotton, bright white, matte, glossy, etc.