The two most common color schemes are RGB and CMYK. An RGB color scheme consists of three colors: Red, Green and Blue. These three colors are projections of light that can be overlapped in millions of color-strengths and combinations to create on-screen colors and images. RGB colors are associated with television screens and computer monitors, but is not used in offset printing.
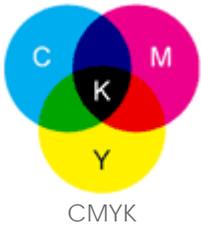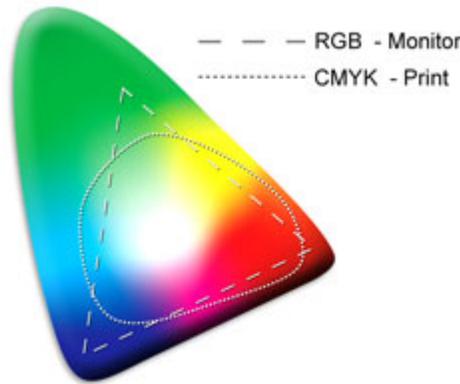

CMYK

CMYK:

CMYK is made up of four colors: Cyan, Magenta, Yellow, and Black. In full-color process printing, CMYK is the standard method for offset printing. In the printing process, CMYK colors are measured by their subtractive/ reflective values; when the colored ink is applied to paper, the surface of the paper reflects some color and the non-reflective (that is, absorbent) color is seen. CMYK colors are obtained by mixing the strengths of each color to produce a new color. The colors are mixed in percentages: 0% represents no color, whereas 100% represents a maximum use of color.

RGB
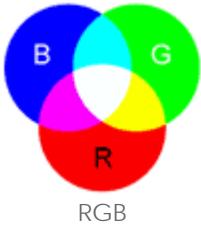
RGB:

The RGB color process and the CMYK color process work in opposite ways. An RGB color scheme forms color through an additive process; to obtain white, all 3 colors are added together, and to obtain black, all 3 colors are removed. In contrast, the CMYK printing process obtains white by omitting all color, and obtains black by using all four colors.One of the major benefits of RGB color is its capacity to produce many more colors than CMYK can. Unfortunately, RGB colors cannot be correctly converted into CMYK. People often find that a color, especially a neon color, created in RGB can't be converted correctly into CMYK but instead appears as an "out of gamut" color, which is usually dark and "muddy". To spot these color errors, and to prevent printing nightmares, it's imperative that all files are uploaded in CMYK format before any printing occurs.

Color Spectrum:

The CMYK process is not without its own drawbacks. One of the major difficulties of CMYK is its recognition of the color blue. When blues are converted into CMYK, they have a tendency to print in purple. This is because blues are very closely related to purples in the CMYK color scheme. To create a purple color in CMYK, there are two variations of color strengths: 80% cyan/90% magenta, and 100% cyan/100% magenta. To create a blue, very similar color strengths are applied: 100% cyan/60% magenta. Because the creation of purple and the creation of blue are so similar, any small error that occurs while creating the document, taking it to pre-press, or printing it out, can change the color from blue to purple. To prevent this color change, we recommend that you reduce the amount of Magenta in your file to increase the likelihood that the color will remain blue when printed.

CMYK also has difficulty with dark reds. When dark reds are converted and printed, they have a tendency to print as dark browns. Like blues and purples, dark reds and dark browns have similar color percentages. Creating a dark red in CMYK requires 100% magenta/100% yellow/60% black. Creating a dark brown requires 70% magenta/100% yellow/80% black. To keep your dark reds from printing as dark browns, we recommend that you reduce the amount of Black in them.

The way that color is viewed on-screen can cause printing issues. A color will never print out to exactly to match its on-screen source. Colors vary from monitor to monitor, and different printers produce different color results. All these variables affect the printed outcome. To better avoid these problems, it is always preferable to view files in CMYK format. This will never be 100% accurate, but it will give you a better representation of your printed file.

When using RGB and CMYK, it is important that you design, view and upload your files in CMYK. Most programs will allow you to view your file in CMYK mode, and we have a list of instructions on how to use CMYK in most programs.

Black:

Black can also be a problem for designers. This problem often occurs during RGB to CMYK file conversions, and is caused

by RGB and CMYK's inability to recognize each others black values; a black color is represented as a "negative" value of "0,0,0" on the RGB color scale, whereas, a CMYK color scale represents black with a "positive" value (e.g. 75% Cyan, 40% Magenta, 40% Yellow, and 100% Black). This occasionally leads to a situation where a rich black color that was produced in RGB, is converted to a duller, watered down color in CMYK.

Unlike CMYK, that generates a wide variety of black color through variant values of cyan, magenta, yellow and black, RGB is limited to a single "0,0,0" value. This doesn't mean that RGB can't generate rich black colors, but it does mean that you have less control over blacks, when they are printed out, or transferred from file to file, and from program to program. Converting into a CMYK color scheme gives designers more control over the black color that is ultimately produced. They are no longer limited to the "0,0,0" value of an RGB black.

When creating blacks in CMYK, many designers make the mistake of setting the black on the CMYK scale to 100% and turning all the other color values down to 0%. This is not, however, the best way to create a "rich" black, and it will cause blacks to print in duller, less-vivid tones. To obtain a "rich" black color, we suggest that you set the CMYK value to: 75% Cyan, 40% Magenta, 40% Yellow, and 100% Black.

Commands in Major Software Programs to Convert Your RGB files to CMYK

Adobe PhotoshopImage/Mode/CMYK

Adobe IllustratorFile/Document Color Mode/CMYK Color

Microsoft Publisher 2000Tools/Commercial Printing Tools/Color Printing/Process colors (CMYK)

Quark Xpress 4.1Edit/Edit Colors/Show Colors in Use/Highlight Color and click Edit. Then change model to CMYK and de-select Spot color.