

Color Matching

“Can you match this color?” is a question that has been asked since the early days of color reproduction. Color is a complex topic, perhaps more complex than the computerized systems used for color reproduction itself. Lets look at a few color matching issues from the viewpoint of the client.

Information to help you get the most from digital imaging

Monitor color vs. printed color...

Although individual monitors can be adjusted to simulate the colors of a given output device, you shouldn't trust your monitor for exact color matching. Monitors display color using red, green and blue phosphors. Phosphors are compounds, that when struck by electrons, emit light in specific spectral wavelengths and brightness. Monitors display color by what is called **additive** color in an RGB color space. Printed colors typically utilize Cyan, Magenta, Yellow and Black (CMYK). The printed image is viewed using **reflected** light, with the inks creating color by the selective absorption of colors reflected by the substrate. Combining inks on paper cannot reproduce many of the colors created by refracting light through a monitor, nor can many of the CMYK or process colors be accurately reproduced in an RGB color space.

More about monitors...

There is no standard setting for color monitors. There are standards for the monitor's "white point", the calibrated level of red, green and blue signals to become a balanced white. This is expressed in degrees Kelvin; lower Kelvin is warmer and higher, Kelvin is cooler. The internationally accepted standard is 5000K, but many people use 6500K for viewing. Monitor color shifts over time due to aging of the electronic components. Some monitors have built in electronic calibration to account for this shift, but they are expensive. There are also monitor calibration tools that help to achieve a balanced display, but the color on your screen still won't look identical to the color on someone else's.

Pantone® (PMS) colors and process color printing

Pantone colors are formulated by mixing specific inks and colorants. Pantone colors are "custom" colors. It's just like getting paint mixed at the store. When an image is produced using CMYK (process color), Pantone spot colors can be simulated, but not actually produced. While excellent color matching results are often realized, not all Pantone colors can be accurately simulated using process color. The resultant spot color is a build using four colors, as opposed to a homogenous spot colorant. Many digital printing systems use an additional two colors, Orange and Green, allowing for more Pantone spot colors to be simulated than CMYK systems. There are also ink systems that use intermediate shades of cyan, magenta and black to add color-matching capability.

Color... Seeing is believing!

No two people see the same color identically and may not agree that a satisfactory match has been achieved. Some factors that influence the subjectivity of color include; A person's age or heredity, levels of ambient room lighting, the source of the lighting (fluorescent, tungsten, daylight), nearby objects influencing the appearance of color, both on the monitor and in the printed piece.



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