DencoSalesTechnicalServices Tech Notes.

Notes on Color Profiling

One of the most common challenges that we face is getting the color that we want to get out of our printer. Many factors come into play here, not the least of which is our own subjective viewing of the color and how it matches our notions of what the colors should look like.

One of the primary concerns is the gamut of the printer that we are using to create the colors. 4 color (CMYK) printers (including variations with light colored inks) are only cable of producing a definitive range of colors. On the other hand, your RGB monitor, where you design, is capable of a much greater range of colors. So your design can have all the colors that you're looking for, but the printer may be the bottleneck that prevents you from getting what you want.

Another common color issue we run up against is trying to match a certain PMS color with our CMYK printer. The Pantone Matching System was designed for offset printing and consists of over 20 base colors which can achieve a very wide range of colors. However, when we try to reproduce these colors with only 4 base colors, we fall short on many of them. One of the best tools when comparing CMYK output to Pantone colors is the Pantone Color Bridge Book. This tool will allow you to see what colors you can expect to match and which colors will be outside the gamut - or color range - of your printer. The good news is that most eco solvent and latex printers can hit more colors than the Pantone Color Bridge would suggest.

The only way that you can get the most color control over your device is to create and maintain color profiles for the printer, media and software that you are using in your own environment. "Off the shelf" profiles are very generalized by nature. They are designed to give decent results on a variety of printers of the same or similar models, in a variety of print environments for a given media and RIP software. By creating your own profiles - or having them created just for you - you can tailor the profile to best meet your needs. You also need to maintain your profiles by calibrating them at regular intervals. All of this comes with some investment - in equipment, software, materials and training.

Any serious discussion on color matching needs to start with a standard that we are trying to match. This can either be a printed sample that is color stable and can be referenced over time via a spectrophotometer for matching or a L*a*b* l c values that can be referenced. You will also need a spectrophotometer that can measure reference samples and print output along with software to compare samples. **You cannot trust your eyes for judging color accurately.** You also need to define the viewing conditions of the sample - primarily the light source used, but also viewer angle and the degree of field of view. And last, but not least, you need to decide the tolerance level that is acceptable and what measurement are you going to use?

Along these same lines is the question of print quality. You need to determine the print quality appropriate for the job. What would be considered acceptable for a banner on the outfield fence would probably not pass for a Point of Purchase display that may be viewed at distance of only a foot or two. The trade offs for print quality, are usually speed and ink load. Higher print quality will require more time to print and generally take more ink to render. Likewise, it's probably not cost effective to try and remove all graininess or banding from those outfield fence banners - the intended audience will not be

able to see the same imperfections at 300 to 400 feet out as you can while viewing the prints on your layout table.

When working with your customer to determine the appropriate the print quality expectations, it would be best to show the banner from at least across the room and get their initial impression before allowing a close up view. Ideally for best color integrity, you should try to replicate the viewing conditions of the final product - in this case, if you could hang the banner outside the customer would get the best impression of the final product.

Finally there are a number of settings in your RIP software that can affect how color is rendered and print quality is determined. Normal install and training only covers the basics of selecting profiles and general settings for outputting to your printer. You will have to invest time and materials to find out what works best for you. If you are interested in advanced training on color management, or if you are looking for someone to create customer profiles for you, please feel free to contact us.