

## Color Management Tips

### Important Color notes:

admedia cannot assume responsibility for incorrect output of photos, completed artwork, logos, etc. submitted as print-ready files. We can assure you our rip stations are color profiled and calibrated so as to reproduce the CMYK values in your digital file as accurately as possible using industry standard CMYK ink densities.

We cannot verbally describe to you what your colors will look like, or assure you will like them. The best way to see what they will look like is to see a proof on the actual material the item is being printed on.

If you have questions about preparing your artwork, please contact us and ask to speak with your Customer Service Representative. We're here to help.

### How accurately will my printed graphics match what I see on my monitor?

The technology used for digital printing is a CMYK printing process, so therefore when printed, RGB monitor colors are simulated using Cyan, Magenta, Yellow and Black inks. Because of wide differences in monitors and how they display color, many printed (CMYK) colors do not accurately match the (RGB) colors you see on screen. Bottom line: although close, the final graphics we produce for you are likely to include colors that do not "match" the colors you see on your monitor.

At admedia, we offer fast turnaround and low pricing by printing industry standard CMYK ink densities. Therefore, we make no guarantee your custom printed graphics will accurately match a specific color you see on your monitor. When it comes to color, our presses have ICC profiles matched to the national standards, but matches are not perfect.

### Will my custom printed graphics match a sample I print out on my own printer?

Here at admedia we offer fast turnaround and low pricing by printing to national CMYK standards. Therefore, there is no guarantee your graphics will accurately match your printed sample. This is due to the widely varying results from different output devices including monitors, inkjet, thermal, dye sublimation and color laser printers, papers, inks, materials, printers and even how they are actually profiled. When it comes to printing color, our presses do very well, but matches are not always perfect.

***Bottom line: the final product we produce for you is unlikely to match "side-by-side" the output from your printer! If your color is critical, please contact us to order a color approval proof to be printed on the same material as your final graphics.***

### Will my graphics match our PANTONE® (PMS) solid coated colors?

The technology used for digital printing is a CMYK printing process, so PMS solid ink colors are simulated using Cyan, Magenta, Yellow and Black inks. To see how your PMS solid ink colors will reproduce in CMYK, we highly recommend you use the PANTONE® solid to process guide.

### COLOR MATCHING using the PANTONE® solid to process guide in print production.

The PANTONE® solid to process guide shows what happens when you reproduce PANTONE MATCHING SYSTEM® (PMS) colors in CMYK. Although many can be successfully simulated, a large majority cannot due to the limitations inherent in four-color process (CMYK) printing. The fan guide displays PANTONE® colors on stock alongside their closest four-color process match. The CMYK screen values are provided for each process color. See "Color Matching: Proceed with Caution" below.

### How can I tell what a particular CMYK color or Pantone color I've chosen is going to look like when printed?

Contact us to order a color proof on the actual material you are ordering.

## **How our process works**

When you place your order and we receive your print ready files, our prepress department will inspect them within 24 hours, checking for any potential problems such as resolution and scaling and send a jpg proof to be used for inspecting the layout only. They cannot guess if the color they are seeing is what you intended. If color is important to you, get a sample printed on the actual material you are ordering before continuing with the project.

## **Color Matching: Proceed With Caution**

### ***Pantone Solid to Process book is much improved but unexpected pitfalls lurk***

By Stephen Beals

This past year, Pantone issued a landmark new color swatch sample book that was meant to bring the company's color-matching system into better sync with the digital production process.

Over all, they did a great thing, but, as with all things related to digital print production, there are some abnormalities that should be known when you go to work with the new system.

Some of the confusion that the new swatch book created in the online forums can be seen as a measure of how far many of us still have to go to really understand color management. And actually, what Pantone did not do may be just as important as what they did do with the new swatch.

Pretty much every problem relating to matching colors on the press, whether with the old Pantone system, the new one or without Pantone colors, is caused by the wide divergence of equipment, software, workflow and know-how employed by the myriad printers around North America. In spite of all the calls for industry standards, almost every printer employs a unique combination of materials and process: inks with different hues, different printing orders and different line screens. The printing world is awash with diversity and that causes a significant problem when manufacturers attempt to adopt or establish standards.

## **That Handiest of Tools - The Pantone Matching System**

For many years - long before the age of desktop publishing and digital printing - Pantone has published those familiar color swatch books for matching color. In the early days, the concept was fairly straightforward. If you print a book of ink colors under very close tolerances, and you assign a number to each color in the book, you have provided a way for printers, designers and ink manufacturers to communicate color. The idea was (and remains) that if you print 1,000 books, color number 485 looks like the same shade of red in each and every one of these books. The designer can confidently predict that when he specifies Pantone 485, the printer will order Pantone 485 from his ink supplier, and the color of the finished piece will look very much like the sample swatch of color in the designer's book.

Of course, nothing is ever quite that easy. For example, the same ink color can look very different on different paper stocks. Inks will invariably print brighter on coated stock than uncoated. And most importantly, with the rise of four-color process printing, many of the colors in the Pantone Matching System books simply could not be matched with process color inks. It was physically impossible.

Back in 1982, Pantone responded to this by printing the first Pantone Process Color Simulator showing the closest available matches to established Pantone colors using CMYK inks. The book effectively demonstrated the difference between solid Pantone colors and the closest simulation of that color achievable with process color inks. By today's digital standards, that book has become a bit of a dinosaur. It was printed using 133-line screens on a yellower paper stock than is used today using a now-seldom-used YMCK ink rotation on the presses.

Because standard screen packages commonly used by printing companies came in 5 percent increments which severely limited the number of colors that could be matched, Pantone worked with screen manufacturers to develop a unique A-Z screen tint system. These special screens were designed to take into account the limitations of the human eye, which does not see color in a linear fashion. This accounts for the somewhat odd percentages including fractions found in the early books. The A-Z books provided a closer color match and also provided the screen manufacturers with a new market for their screens.

In 1990, Pantone updated its book by increasing the line screens from 133 to 150, the predominant line screen used at the time by high-end commercial printers. Further, Pantone produced the book using digital image setters to more accurately demonstrate the process color result using a laser-generated dot pattern. The A-Z screen tint percentages remained the same to provide compatibility with the software applications.

### **Time for a Change**

Two years ago, Pantone brought its Solid to Process book up to date, reprinting it with 175 line screens, brighter paper, a KCMY ink rotation and digital screening.

The fly in the ointment, in the minds of many users, is the fact that Pantone also had to modify some of the screen percentage formulas used in the book. The smaller screen tint increments available in digital screening allowed for more accurate process matches to solid Pantone Colors and provides users with closer color matches than previous versions of the book. This meant the actual hue of the ink swatches also changed in some cases.

Because by 2000 almost all prepress work and a substantial majority of proofing was being done digitally, this meant all of the tables supplied by Pantone to partners like Adobe and Quark also had to be updated. But it is not obvious to the users of these software programs which version of the Pantone color tables are being used.

### **Danger!**

There is some danger lurking for inattentive users. For example, Quark 4.0 uses the old Pantone formulas and Quark 5.0 uses the new ones. Adobe InDesign 2.0 and Illustrator 10 use the new color tables, but in Illustrator 10, there is a range of colors where the data used was incorrect. Adobe acknowledged this early on and posted a support document referring users to the Pantone website, [www.pantone.com/support/support.asp?idArticle=73](http://www.pantone.com/support/support.asp?idArticle=73), for a free update. CD ROMs with the new data were also shipped with the product during the initial launch for almost an entire year to enable the software applications to get updated.

Where changes have been made, the new formulas will be closer to the actual Pantone color than the old ones. However, many users are not as concerned with matching a specific color as matching last year's press run. The differences can be particularly noticeable when light screen tints of a solid color are used.

### **Other Issues**

There are a few additional issues printers and designers who want to use the Pantone Solid to Process tables need to be aware of:

1. Pantone has also renamed the colors in the tables. Pantone 485 is still the same red you've always known, but older versions of the various tables used in typical publishing programs like Quark, Illustrator and PhotoShop may have added different tags to the color. You are no doubt familiar with the fact that Pantone 485 has for many years had a coated and uncoated version, logically called Pantone 485C and Pantone 485U. But, you may encounter Pantone 485CV, CVC or CVU in the tables of older versions of the publishing programs. CVC and CVU were suffixes for "Computer Video Coated" and "Computer Video Uncoated" to signify that this was a video simulation of a Pantone Color. This suffix would sometimes be truncated by the publisher, which is why it would sometimes be represented as 485 CVC in one software program and 485 CV in another.

Once again, what Pantone attempted to do is make things simpler and more logical. The printed color guides and the color in the digital tables now match. The color tables in the latest versions of Quark, Illustrator and PhotoShop reflect this. Because the new guides are printed on Coated, Uncoated and Matte papers, the codes are either C or U or M. In the short term, of course, this adds to the number of possible codes since many programs which have not yet been updated are still in wide use.

If you print many spot colors, you are probably aware that most high-end Raster Image Processing (RIP) devices will see each different name as a different color. This can lead to major output problems. Since the default name for a coated Pantone ink in Illustrator 9.0 is CVC and in Quark 4.1 the default name for the same color uses the extension CV, most RIPs will print them on two different pieces of film. While there are fixes like Creo's spot color extension for Quark, which will marry those colors together on output, it seems like a problem that never should have occurred.

**2.** Using color profiles in programs like PhotoShop can play havoc with Pantone colors. PhotoShop stores Pantone Colors as L\*A\*B\* and CMYK, so when the rendering intent is changed, the ink percentages in the Pantone formulas change along with them. That makes sense, of course: profiles are intended to adjust the input from any source to match the specific output printer. When you profile a printer you are not measuring dots at all, but using a spectrophotometer to measure the saturation and hue characteristics of that printer. Since all printers and presses have different printing characteristics, selecting colors by dot percentages and ink density is really a poor way to do it. The folks at Pantone will readily admit you should not apply a profile to a Pantone Color specified in CMYK color space. But in the real world of printing, a lot of folks are still reading ink dot percentages to "control" color.

Try this: Create a Pantone 287 block in PhotoShop, and then apply different color profiles to it. The percentages of that color block will shift, sometimes dramatically depending on how different your profiles are. What happens in the real world is this: people are applying profiles when they shouldn't. A profile should really only be applied on final output. It is fine to view a photo in the output profile so you can see what the output device will do to the image, but if you actually apply that profile, you are already creating the color transformation. When the output device gets hold of the image, it will apply the transformation again. The fact that you want to know what the output device will do to the image is the reason for creating the profile in the first place. You don't want to apply that twice. It's sometimes referred to as "double profiling" and can completely ruin an image. The chances of having a Pantone color survive double profiling and look anywhere like it should are "slim" to "none".

**3.** If you are printing by GRACOL guidelines, or by SWOP standards, you should be aware that Pantone used neither standard when printing the new books. The company says "We evaluated both the GRACOL guidelines and SWOP standards to achieve a well-balanced process printing publication that falls within commercial printing tolerances to ensure achievable color reproduction."

The fact is that both SWOP and GRACOL standards would not allow nearly as many accurate color matches as Pantone was able to achieve. The color gametes achievable under these standards are simply far too limiting when you are trying to show the ability to match as many Pantone solid colors as possible using CMYK inks. Pantone was opting for press settings that could achieve the largest range of good matches while staying within a tight tolerance window to match the solid colors in the book.

### **The Long Road - A Possible Solution**

Some have suggested that the best way to handle the color-matching dilemma is to use your client's Pantone color book, but to haul out your handy spectrophotometer and read the L\*A\*B\* values of the swatch. You can then export those values to many RIPs, which can take responsibility for getting the values right for your presses. Once you're sure you have hit the color, you can revise the look-up tables in your software to correspond to your own workflow. It may be worth the time and hassle to get the right color for an important customer or a special color that will be used many times.

Pantone says: "We tested this so-called device-independent workflow across virtually all popular RIP/profiling combinations. Almost without exception, we view the color results as it pertains to Pantone color matching to be unacceptable. Only the best color scientists have been able to demonstrate acceptable results to us."

Some posters to online message boards have flamed the company pretty badly. The truth is, Pantone is not entirely responsible for the types of problems discussed here. The conversion from analogue to digital has taken place over a long period of time and the demand not to change is often stronger than the push to enact changes. Additionally, some software developers have been slow to implement the changes and have constructed user interfaces that are at best confusing and at worst more likely to cause more problems than they solve. And in spite of the chat board comments, Pantone says they have not received complaints on their various help venues.

The fact that GRACOL has yet to become a clear industry standard has severely limited its usefulness. Perhaps it is reasonable to say that if Pantone had adopted it as a standard for its books, it might have come a long way to solidifying it as an industry standard. The standards controversies could be a separate article entirely.

The new Pantone Solid to Process book is certainly an improvement over the old one, but users need to be aware of the possible pitfalls. Most of them will go away over time as software developers and users adopt the new tables. It is not the digital reference tool many would like it to be. It is a very handy tool for understanding color communication in process and solid color.

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