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Product Review

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Learning To Love Pantone's New Color Bridge Guide

BY STEPHEN BEALS

Pantone will no doubt make many friends with its new solid-to-process guidebook, dubbed Color Bridge. But as with its previous product revision, some customers will moan and gnash their teeth simply because new formulas for the Pantone Matching System CMYK conversions have widespread implications — not all of them good — for the day-to-day management of printing jobs.

Part of the reason prepress operators and some designers are less than eager to see Pantone's new Color Bridge process guidebook is the same reason they will want to buy it: It's the definitive industry standard for defining formulas for replicating Pantone Matching System (PMS) colors. Nearly every major graphics software publisher licenses Pantone's color guides and includes the formulas in their products. That overwhelming popularity is also the source of consternation when changes are made. It's a lot like when the phone company changes your area code: You know they have to do it and that it's a good thing, but you wish it wasn't such a hassle when it happens.

The changes are significant enough that Pantone decided to christen this release with a brand new name, Color Bridge. At first glance, the guide closely resembles the book it replaces, and it displays a Pantone solid color and its four-color counterpart side by side. But the new book is significantly larger, as is each individual color swatch. It is also printed on a brighter, more durable paper stock and adds both RGB and HTML data, in addition to the CMYK color recipe for each swatch, making it more useful for Web designers.

The most significant changes are more subtle. Pantone has used color management software and a completely digital workflow to improve the quality of the CMYK swatches. Pantone also used an all-new, extensively calibrated and profiled printing press to provide optimum accuracy for the solid color swatches in the book. In the process, some 95% of the color recipes have been modified in the new book, and a close side-by-side comparison with the old book shows that the color matches are certainly improved — in some cases substantially. That, after all, was the key impetus to creating a new guide: to improve the printed product and enhance the four-

color representations of Pantone colors.

Color Bridge also demonstrates that Pantone has recognized that print workflow has changed in recent years and that the vast majority of printing is now done with digital screens, color management systems, finer screen resolutions and brighter papers.

A Little History

The concept of the first Pantone formula guide hasn't changed much since its inception nearly half a century ago. By printing a guide with ink swatches under very close tolerances and assigning a number to each color in the guide, it provided a way for printers, designers and ink manufacturers to communicate color. If the color "Pantone 485" looks like the same shade of red in each of these books, the designer, printer and ink manufacturer all start from the same point and see the same color.

The original selection of 500 colors has now grown to include 1,089 in the Color Bridge guide alone. Pantone also publishes several other guides, including an array of books for the printing industry, as well as guides for other industries, such as cosmetics and home decorating.

Pantone, of course, faces the same problem every printer and designer faces: the many variables that come into play when you smear grease on ground-up bits of wood. The printing process itself is just not perfect. The same ink color can look very different on different paper stocks (Flint and other ink companies



PANTONE color bridge

New taller, wider size

Larger color swatches

Modified CMYK screen tint percentages

Improved matches in four-color process

sRGB and HTML value for solid colors

Brighter, more durable paper

PANTONE® Solid CMYK

PANTONE 317 C
R 187 G 231 B 230
HTML BBE7E6

PANTONE 317 PC
C 24 M 7 Y 0 K 0

PANTONE 318 C
R 143 G 223 B 226
HTML 8DFE2

PANTONE 318 PC
C 41 M 0 Y 12 K 0

This is what the new Color Bridge guide looks like. About an inch and a quarter longer and a quarter inch wider than previous Pantone solid to process guides, the new size allows for bigger swatches and additional RGB and HTML data.

publish a book with the exact same ink printed on a number of different stocks to demonstrate how dramatically paper stock can affect ink color).

Four-color process printing exacerbates the issues of color matching. Many of the colors in the Pantone matching system books simply cannot be matched with process color inks. In modern color management terminology, some of the solid colors are “out of gamut” of the CMYK color spectrum, and a perfect match is physically impossible. The first Pantone Imaging Guide in 1982 was intended to show the closest available matches to established Pantone colors using CMYK inks.

The Closest Simulation

That color guide effectively demonstrated the difference between solid Pantone colors and the closest simulation of that color achievable with process color inks using the printing process commonly used at that time. The 1982 edition was printed using 133-line screens, paper stock with much less brightener than is used today and a YMCK ink rotation on the presses that is seldom used now.

The possible color matches were severely limited because standard screen packages commonly used by printing companies only came in 5% increments. Pantone worked with screen manufacturers to develop a unique A-Z screen tint system, 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 presented a closer color match and provided screen manufacturers with a way to sell more screens.

In 1990, Pantone updated its book by increasing

the line screen from 133 to 150, and produced the book using digital imagesetters 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.

If You Use Color Management, Do You Need Color Bridge?

Color management has certainly improved greatly over the past few years, and Pantone took advantage of the superior technology to improve its guide. But for most people in the “real world,” color management is not the automatic plug-and-play tool some would like it to be. Many people do not understand how to apply International Color Consortium (ICC) profiles, and many use color management incorrectly. Incorrectly applied profiles can be much worse than no color management at all.

Even when color management is done correctly, the human eye, with its subjective perception of color, is the final arbiter of whether color is “correct.” Ironically, the meticulous work the company did to achieve better formulas highlights some of the weaknesses of color management software. Pantone’s team tested software from several companies to arrive at the specific numbers for the formulas. But even after selecting the software vendor whose product most closely fit its needs, the team also used visual assessments to evaluate the colors and found it necessary to “tweak” individual color matches in many cases to improve the match.

The Pantone Color Bridge guide — a visual, portable and industry standard measurement tool — is the favored tool for selecting and matching colors. Since it is an “ink on paper” guide, it’s ideal for predicting color whose final destination is ink on paper. But the critical question Color Bridge answers is how to accurately predict how the CMYK transformation process will affect a given color. Of course, knowing when a good color match is simply not possible might not please the designer, but having that information in advance is certainly best. For many designers, having an ink-on-paper version of the color they can hold in their hand, place on top of a product and carry in a briefcase is the ultimate form of color management.

Real World Issues

This is where the moaning and gnashing of teeth begins, but it doesn’t have to be a problem. Pantone’s new formulas are noticeably better and will reproduce better on press, and that’s good. But the differences can lead to unanticipated results for users who are not aware of the changes. Designers and printers who are aware of how these changes affect production can avoid potential problems. For instance, what if you are using Pantone 466, one of the colors that is considerably improved, with a formula that’s much different

What's New?

To make Color Bridge a better guide, Pantone:

- used an ink set that conforms to ISO-2846-1 with strict quality control (QC).
- used No. 1 grade 80-pound gloss cover paper stock (again with strict QC). This paper is both brighter and more durable than previous editions.
- achieved optimum printing conditions, then performed profiling and maintenance on four-color press before production.
- established Lab values for the solid colors, based on the paper, and then converted those values to RGB.
- used current profiling software to generate color recipes.
- performed both instrumental and visual QC on every color, making adjustments where required.
- generated digital press proofs and production press proofing.
- performed both instrumental and visual QC on press proofs.
- used a new custom printing press for printing the solid ink colors.

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from the previous one? If it's a new job, that has to be a good thing. But suppose it's a job you've printed before. Is it more important to match the previous printing or the swatch book?

You can use the old formulas and tables if that is more appropriate. Pantone understands the issue of legacy art, so the new Color Bridge libraries supplement and co-exist with the earlier solid-to-process libraries. This way, the user can choose whichever is more appropriate. What is critical is knowing that the changes in the Color Bridge guide can potentially change the actual color of the output.

Putting Libraries to Use

As mentioned previously, software vendors, including the Adobe CS product line (Illustrator, Photoshop and InDesign), QuarkXPress, CorelDRAW and Macromedia FreeHand, all license the Pantone libraries and make them available as digital color libraries in their applications. It often takes some time for vendors to update their libraries, and many different versions of the libraries will remain in circulation for years. You can download the new libraries (Euro Coated and Process Coated) from the Pantone Web site at www.Pantone.com.

Pantone's comprehensive guide for installing the libraries into a wide variety of desktop applications, called the Pantone Color Bridge Digital Library User Guide (available at www.Pantone.com), also provides detailed instructions for opening libraries from within programs.

Also keep in mind that the Pantone naming convention is to add a suffix to the Pantone color to indicate what might be called the "output intent" of the color. The following suffixes have been used over the years:

- U = uncoated paper
- C = coated paper
- M = matte paper
- CV = computer video (electronic simulation)
- CVU = computer video — uncoated
- CVC = computer video — coated
- (CV, CVU and CVC are no longer used)

The suffixes PC and EC are for solid-to-process conversions and were used in the prior versions of the solid to process libraries:

- PC = Process Coated
- EC = Euro Coated

Potential Suffix Confusion

It is important to know how your workflow handles the mapping of spot colors. Current versions of most applications replaced the old CV, CVC and CVU suffixes with C, M and U suffixes five years ago, though many legacy files use the old naming conventions. And designers are still generating files using older programs that, in turn, use older naming conventions.

Although software upgrades could eliminate this problem, prepress operators frequently encounter files where elements on a single page might have the color Pantone 485 specified as Pantone 485 CVC, Pantone 485 C and Pantone 485 U. Many RIPs will still map each of these colors to separate channels, thinking they are actually different colors. While a few RIPS auto-

Pantone used this custom-built KBA Rapida 105 press for the new guide. It is located in Pantone's Carlstadt, N.J., headquarters.





A pressman at the Pantone facility pulls a sheet for inspection during the printing of the newly released Pantone Color Bridge guide.

atically map all of these colors to a single color channel, and many vendors have included the ability to manually map the colors correctly, the potential for problems remains.

Pantone said the RIP manufacturers that license Pantone libraries use Pantone-approved Lab values, which means that the CMYK output for the various Pantone suffixes will be interpreted the same way regardless of which suffix is used.

Beware Of Design Shortcuts

Other potential problems have more to do with operator carelessness than new color libraries. Many designers simply don't use the color libraries correctly, selecting Pantone 485 C where a process color is intended, for example. In fact, programs such as Adobe Illustrator allow a user to assign a Pantone Library color like Pantone 485 PC and specify it as a spot color, or to specify Pantone 485 C to print as a process color. Incorrect choices of color space can wreak havoc with output.

Some versions of Adobe Photoshop Duotone creation software use an unfortunate and potentially troublesome naming convention. Instead of naming the black printer in a black-plus-solid-color duotone "black," the default name is "Pantone Black," which can cause problems with the RIP assigning a separate color to the Pantone Black channel.

Potential problems also arise for non-Pantone licensed RIPs, depending on where the RIP picks up the color data for the CMYK conversion. If you have a Pantone 466 C from Quark 6, 466 CVC from an Illustrator 5 EPS file and 466PC from an Illustrator CS file

within the same document, they might separate out using different formulas. Although the colors would be similar, there would certainly be some difference in each rendition of the color.

Pitfalls to Avoid

Using color profiles in programs like Adobe Illustrator or InDesign can change the values of colors. When the profile or rendering intent is changed, the ink percentages also change, which effectively means colors keyed to a Pantone formula will change along with them. While that might appear to be an error, profiles are intended to adjust the input from any source to match the specific output printer. The values must be changed to match the actual output. After all, you don't want to print a specific dot percentage so much as you want to attain a spectral match on the finished product. Of course, the real question is, what data does my RIP actually use? As noted, Pantone-licensed RIPs use the Lab data for the color. You'll need to know how your RIP actually deals with the file.

When you profile a printer, you are not measuring dots at all, but instead are 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. Remember that the formulas Pantone uses to match colors are derived from spectral readings and the dot size equivalent is computed from that reading, not the other way around. When output is done to a CTP device according to a press profile, it is almost certain that the dot percentages won't be the same as the formula, which is normal. Even though the guide shows the user a color in terms of dot percentages, we are trying to match a color, not a dot. The color profile will adjust the dot to best match the desired color on press.

But even if they should be using a spectrophotometer on press, in the real world of printing, a lot of people are still reading ink dot percentages and ink densities to "control" color. Chasing dot size is a good way to ruin a print job.

Prove It to Yourself

To prove it to yourself, try this test. Use the program you are most familiar with, such as Photoshop, Illustrator or InDesign. Create a 4-by-4-inch window and fill it with 100% Pantone 466 and apply different color profiles to it. Use the eyedropper or info tool to check how the dot percentages of the color block will shift, sometimes dramatically, depending on how different your profiles are.

Color profiles are designed for a specific output device and should only be applied on final output to that device. 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. If your RIP

A System That Works in the Real World

There's a fine line between getting the best possible color match and printing the guide with easily achievable press settings. Using a standard such as SWOP (Specifications for Web Offset Publications) does not use anywhere near the full extent of the color gamut achievable with CMYK inks because by definition the standard is an attempt to cover the broadest range of press printing characteristics. Web presses in general are built for more speed at the expense of some degree of quality, and SWOP standards were developed for a broad range of web presses. To use SWOP for a swatch book used by both designers and sheetfed printers would severely limit the number of achievable color matches.

GRACoL (General Requirements for Applications in Commercial Offset Lithography) does not use the full range possible either, but it does use a considerably wider range than SWOP. The GRACoL standard was designed for sheetfed presses printing an ISO standard ink set, on commercial coated paper stock. The target ink densities are also higher. For this reason,

Pantone adopted the GRACoL standard in printing its Color Bridge guides.

Because the GRACoL standard is still in development, Pantone used the current published standards as the basis for its starting point and published the specific settings used for printing the book.

Pantone produced its Color Bridge guide in compliance with ISO ink standard 2846-1 and where applicable, with ISO 12647-2 for printing the halftone dots. Pantone publishes the specific printing conditions used in producing the Pantone Color Bridge guide. All of the technical information is available from Pantone and is also printed here:

- screen angles (K 45°, C 15°, M 75° and Y 90°) Euclidean dot,
- inks (ISO 2846-1),
- paper (No. 1 grade, 80-pound gloss coated cover stock),
- line screen (175 lpi),
- target ink densities (K 175%, C 140%, M 145%, Y 100%).

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recognizes the profile, it should not make the transformation again, but problems can occur here, too. The RIP might have its own library of Pantone colors and might pull the data from those libraries and replace the data from the native file. This is another place where you need to make sure the proper Pantone Libraries are installed.

The bottom line is, you should not apply a profile to a Pantone color specified to print in CMYK color space.

Our Take

Designers and printers will probably express some dismay regarding the new Pantone Color Bridge, but they are an improvement and, with proper handling, should not present any obstacles professionals aren't already accustomed to handling. Thanks to bigger guides and swatches, better color matches and included RGB and HTML values, the Pantone Color Bridge represents a new industry standard from a company that has been setting the bar in color for decades.

Still, there are a few things to remember: About 95% of the formulas are different, and you need to be aware that yesterday's Pantone 466 PC (the "PC" suffix means we are talking about the process simulation of Pantone 466 C) is not the same as the new version.

You might have to decide between having a better match to the color swatch or matching something you printed a year ago.

Make sure you know how to deal with mapping colors and how your workflow might be affected by the different suffixes found in older application software as well as the different conversion formulas used in the libraries. Keep in mind that the formula for Pantone 466 PC is not the same as the formula for Pantone 466 CVC. And remember that you can download the new libraries from the Pantone web site.

For more than 40 years, Pantone has provided color-matching solutions for the design and print industry, and the Pantone Matching System has been an industry standard for as long as most printers can remember. The new Pantone Color Bridge guide provides a significant improvement in the way designers and printers communicate color in the Digital Age. With the information provided here to steer you around potential problems, printers and designers will be able to use this new guide to improve their finished product. And that is everyone's goal.

(Editor's note: Pantone commissioned a white paper on this subject written by Mr. Beals, but did not alter or edit this version for THE SEYBOLD REPORT.)

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