Understanding Color Spaces and the PANTONE MATCHING SYSTEM

Color spaces define boundaries within the visible color spectrum. Think of a color space as a pointer showing the location of a specific color. Colors are represented by color coordinates. As the size of the color space increases, more colors are represented. All colors outside the fence are not. The area inside the fence is referred to as a color space. CIE 1931: In 1931, the Commission Internationale De’Eclairage (CIE), the international standards body that deals with all aspects of light (and hence color), created what is known as the CIE 1931 color space. It is a mathematical model that uses synthetic, imaginary primaries that represent our eye’s perception of color. In 1931, they were spectrally pure primaries, RGB provides a very wide range of colors. The sRGB, or “standard” RGB, color space was developed by Microsoft and Hewlett-Packard as a device-independent color space that is compatible with most computer monitors and other peripherals. It includes a D50 (6500K) white point, a monitor gamma of 2.2 and other various other standards for viewing. It is provided to uniform viewing conditions across various monitors resulting in consistent visual results.

CMYK: CMYK is in some respects the opposite of RGB color spaces, as it is based on subtractive processes. It is used in printed media such as newspapers, magazines, and blue. In theory, equal quantities of CMY should produce black, but green and blue. In practice, the cyan, magenta, and yellow inks are printed with increasing amounts of PANTONE Black to maintain the appearance of a color.

Understanding the PANTONE FORMULA GUIDE 14 PANTONE Basic Colors

The PANTONE Basic Colors found on pages 1.1 and 1.2 of the FORMULA GUIDE, plus PANTONE Transparent White, are the building blocks of the PANTONE MATCHING SYSTEM. Precise mixtures of these PANTONE Basic Colors, proportions, and percentages, allow the ink mixer to accurately create the 1,114 unique spot colors in the current PANTONE Color Libraries. The exact combination of a PANTONE Color Chip is listed on the PANTONE Color Chip to all copies of your project to ensure that the end result of a project meets the expectations of everyone involved in the process. Pantone recommends the following:

1. Replace your PANTONE FORMULA GUIDE annually, and make sure that Pantone Licensed Printing In-House Manufacturers provide or ship new PANTONE CHIPS books on a regular basis. Most PANTONE Colors, such as PANTONE 186 C, have the center-line color in the middle of the page; however, as colors were added, exceptions occurred. For example, page 283 C, the Basic Color Violet is the center-line color but appears in the middle of the page. The important thing to remember is the concept of adding PANTONE Transparent White or PANTONE Black to change the appearance of a center-line color, whatever the center-line color appears on the page.

The Center-line Concept

The FORMULA GUIDE is printed with seven colors per page and uses a “center-line” concept. The center-line color (usually, but not always, the color in the middle of the page) is a brilliant color often one of the four of the PANTONE Basic Colors. Brighter colors are printed using the same ratio of PANTONE Basic Colors as the center-line color. The center-line color (usually, but not always, the color in the middle of the page) is a brilliant color often one of the four of the PANTONE Basic Colors. Brighter Colors are printed using the same ratio of PANTONE Basic Colors as the center-line color. The center-line color is a PANTONE Spot Color (shown as black dots on the diagram above). The PANTONE MATCHING SYSTEM is not considered a color space but a color system. Although one could connect the outermost dots in the diagram, the result is not a gamut since there are a finite number of colors that are included in the PANTONE MATCHING SYSTEM.

The colors in the PANTONE MATCHING SYSTEM have been selected to encompass as much of the visual color space as our ink sets allow. The chromaticity diagram shows that there are PANTONE Spot Colors spanning much of the CMYK and sRGB color spaces. However, when CMYK or sRGB representation is not acceptable, the use of spot colors ensures the perfect color every time.

The high level of quality control in creating Pantone’s publications means that they are a reliable source for color communication. Ideally, the PANTONE MATCHING SYSTEM is used in all stages of the design and production of printed materials ensuring that the final output will meet your client’s expectations.

Why Pantone Recommends Replacing Your PANTONE FORMULA GUIDE Annually

The formula for a particular PANTONE Color never changes; the formula for PANTONE 186 C is always PANTONE 186 C. All spot colors in the PANTONE FORMULA GUIDE and PANTONE CHIPS books are color coordinated. When printing the same spot color in different situations, the color will vary along with the paper substrate or base color of the printed material. The PANTONE MATCHING SYSTEM is a transparent ink system, and the color, appearance, and quality of the final printed product will affect the appearance of the printed color. As the color changes on the page, the color will appear to shift, affecting the appearance of the printed color. Pantone continually publishes PANTONE FORMULA GUIDES and CHIPS books on three different paper bases, as mentioned above. Therefore, any M series chip is not intended to provide a visual reference of the different papers that have on color matching, but use what is known as the Concept of Matching. This is important for Computer Video, Computer Video Colored and Computer Video Uncolored. These chips have been used in computer programs since 2000 and are no longer used.

Thus, our color formulas haven’t changed over the years. Our paper material is also consistent (for the most part) across print and digital white papers. Pantone changed the paper used in our guides in 2003.

Finally, because paper yellow with white and iridescent, the appearance of a print will vary along with the paper substrate or base color of the printed material. A PANTONE FORMULA GUIDE and CHIPS book provides or ship new PANTONE CHIPS books. Therefore, Pantone recommends the following:

1. Replace your PANTONE FORMULA GUIDE annually, and make sure that Pantone Licensed Printing In-House Manufacturers provide or ship new PANTONE CHIPS books on a regular basis. The high level of quality control in creating Pantone’s publications means that they are a reliable source for color communication. Ideally, the PANTONE MATCHING SYSTEM is used in all stages of the design and production of printed materials ensuring that the final output will meet your client’s expectations.

2. Always specify colors using the PANTONE FORMULA GUIDE that corresponds most closely to the printed substrate colored, uncoated or matte.

3. Since the substrates used in the project will almost certainly differ from those used in the PANTONE FORMULA GUIDE, always attach a PANTONE Color Chip to all copies of your project. PANTONE Color Chip has been referred to as the “world’s smallest canvas” and is the visual quality reference that defines the print material.

The PANTONE MATCHING SYSTEM in contrast to the commonly recognized color space, the PANTONE MATCHING SYSTEM is a color communication system, with each color referred to as a PANTONE Spot Color (shown as black dots on the diagram above). The PANTONE MATCHING SYSTEM is not considered a color space but a color system. Although one could connect the outermost dots in the diagram, the result is not a gamut since there are a finite number of colors that are included in the PANTONE MATCHING SYSTEM.

The colors in the PANTONE MATCHING SYSTEM have been selected to encompass as much of the visual color space as our ink sets allow. The chromaticity diagram shows that there are PANTONE Spot Colors spanning much of the CMYK and sRGB color spaces. However, when CMYK or sRGB representation is not acceptable, the use of spot colors ensures the perfect color every time.
Using the PANTONE FORMULA GUIDE

The PANTONE FORMULA GUIDE is an invaluable resource for professionals who specify, communicate, reproduce, match and control colors. MATCHING SYSTEM Library of Colors is used to accurately select, specify and communicate colors that are designed anywhere in the world for production and reproduction.

In the midst of this digital age, our goal is to facilitate the reproduction of the colors found in PANTONE Products throughout the world. Pantone uses the highest level of quality control in the manufacture of all PANTONE Colors displayed here may not match PANTONE-identified standards. Consult current PANTONE Color Publications for accurate color.

Pantone also sells its line of color scales programmed with all formulations for precise color mixing.

To locate our worldwide list of Authorized PANTONE Resellers, visit: http://www.pantone.com/dealers

For Additional Product or Technical Information:
Visit Our Application Site: http://www.pantone.com
Call Pantone Technical Support: 888-PANTONE (726-8663), then Press 2
Call Pantone Customer Service: 888-PANTONE (726-8663)
For consultation on uncoated, coated, or PANTONE Vista colors, please visit: http://www.vistatech.com

PANTONE MATCHING SYSTEM Palette of 1,114 colors that exists today. The current PANTONE MATCHING SYSTEM was introduced in 1963. Now there are three major expansions of the PANTONE MATCHING System Palette.

Since the introduction of the PANTONE MATCHING SYSTEM and PANTONE FORMULA GUIDES in 1963, there have been three major expansions of the PANTONE MATCHING System Palette. The original PANTONE MATCHING SYSTEM Palette consisted of 500 colors, chromatically between the original PANTONE Colors. In addition, four lightfast PANTONE Colors were introduced. The new colors were given four-digit numbers and inserted between the original colors. In 1991, the PANTONE MATCHING SYSTEM was reintroduced on matte paper.

Pantone’s Color History

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Application Across Industries

While the PANTONE FORMULA GUIDE is a reference for lithographic ink mixing formulas, it is also extremely useful in all areas of graphics, printing and various other industries. For example: a box manufacturer may get an order for packaging specifying the color PANTONE 284 C. Though the company prints with flexographic ink, the company will have skilled technicians that are able to match that color with the use of a PANTONE FORMULA GUIDE or a PANTONE CHIPS as a reference. Without the guide, this would be impossible unless a physical sample of the desired color is sent to the printer.

Today

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