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Color Management: a guide

gettyimages®

20014056-012 Simon Watson

Contents

Getty Images test image
This was created to give users an opportunity to test their color management system. The theme of the image is communication, testing instrumentation and visual aids. Three models with varying skin tones were chosen and each item covers all the color management essentials: highlights, midtones, shadows, catchlights, neutral and vibrant colors. Equipment: Mamiya RZ, with Phase One H20 back (16 mega pixel). Lighting: strobe 5,000 Joule pack through two heads plus two Bowens (1,000 Joule) monolights, all bounced off white surfaces placed symmetrically on either side of camera.

gettyimages.com/color-resources

Defining the challenge

If you have been designing with digital images, here's a scenario you may have encountered: leafing through an image resource book, you find an image with perfect colors for the design you're working on, so you purchase and download the image, or purchase a CD-ROM that contains it. But when you view it on your monitor, the colors don't match the image in the book at all. When you print it the colors are not even close to the original. What went wrong? Why and where?

Designing with color isn't an automatic 'what-you-see-is-what-you-get' proposition.

Reliable color reproduction requires knowledge, patience, a fair amount of experience and the right tools.

Color management systems (CMSs) attempt to account for the different color reproduction capabilities of scanners, digital cameras, monitors and printers—that is, all the devices in the chain from initial input to final output. CMSs do the best they can with all the variables present. However, colors—and their reproducible ranges—tend to change between devices and environments.

20014056-005 Simon Watson

200119063-002 Manfred Rutz

RGB to CMYK

Color management is the ability to accurately predict and control color while on this device-to-device digital journey.

It isn't an arcane science but anyone who's dabbled in it knows that it isn't exactly child's play either. Neither is color management an exact science.

High-tech advances continue to shift more color and production control away from service providers and into your hands. With this additional control comes more responsibility and the need to become more of a color expert. We can help you to do that.

This color guide will help you solve many of the problems you'll encounter on the path from RGB (the color space of your monitor) to CMYK (the color space of a four-color press).

RGB files contain more color data (larger gamut) than CMYK files, and they weigh less in Megabytes. This means the RGB file is bigger, better (can be re-purposed more accurately) and weighs less than its CMYK counterpart.

Getty Images printing procedure

There is no CMYK data manipulation in our printed products. We use the same JPEG version of the file that you would receive, then use profiles to convert to CMYK. Once this is done there is no alteration to the CMYK data at all. What you see in our marketing material is a clean interpretation of the RGB file that has been converted specifically to that particular paper stock type and press condition.

What are ICC profiles?

Profiles, simply put, are device characterizations containing every variable in the color-reproduction process. It is critical that the data they contain are up-to-date and accurate.

The ICC (International Color Consortium) is a group of companies that have joined forces to create, promote and encourage the standardization and evolution of an open, vendor-neutral, cross-platform color management system (CMS). Since its inception in 1993, the ICC has grown from eight to over 50 companies, including Apple, Adobe, Heidelberg, Sun Microsystems, and Sony.
The ICC has developed standard profiles, or device characterizations, that contain information about the color-reproduction capabilities of devices such as scanners, digital cameras, monitors and printers.

Working closely with your service provider is the best way to take advantage of ICC profiles and establish a reliable CMS.

The four places where profiles are needed

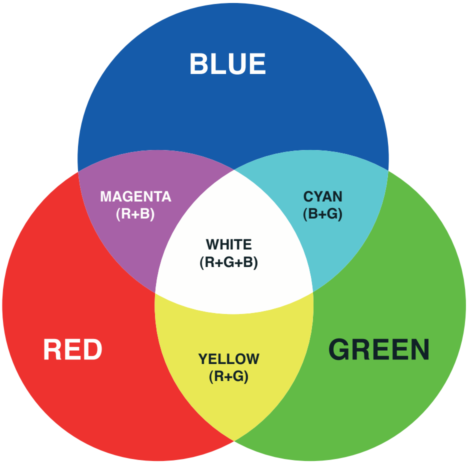
Source: This profile represents the gamut of the image. It can be embedded in the image, chosen in the application, or it can be a standardized color space such as sRGB.

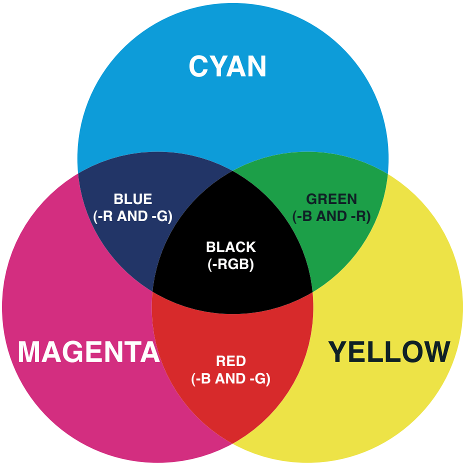
Monitor: You can use the profile supplied by your monitor's manufacturer, or create one using a colorimeter or spectrophotometer.

Proofer: In most cases, profiles for color printers can be obtained from the manufacturer (check their website) or built using a spectrophotometer and profiling software.

Final output: Going to press is where the big money is spent and where an accurate profile is vital. Work with your service provider to determine the exact requirements for your project.

Color guide





Step 1: Calibrate your monitor

Before tackling the specifics of monitor calibration, let's consider a few general points about color and color reproduction. To begin with, keep this crucial rule in mind: color perception is subjective, ie. everyone sees color somewhat differently. Color, it's also worth noting, isn't an object. It is a property of light, an object's reflection of a particular portion of the visible spectrum.

It is affected by the light in your surroundings, especially when perceived on the printed page. For example, when viewing printed materials under an artificial light source such as a fluorescent light, which has a bluish tint, the materials will appear bluer.
There are basically two kinds of color rendering or reproduction: additive (the process used by monitors) and subtractive (the process used in print). With additive color (RGB), red, green and blue lights from the monitor are added together in varying degrees to create other colors. With subtractive color (CMYK), four colorants–cyan, magenta, yellow and black–that subtract, or absorb, components of white light are mixed. Changing the amounts of colored lights (additive) or the amounts of the colorants (subtractive) gives us a wide range, or gamut, of colors. Monitors (RGB) can normally render millions of colors while printers (CMYK) can render thousands. Our images are provided in RGB to give you the widest gamut.

Exact Science? think again
As we said, color matching during the reproduction process is not an exact science. Not only is color perception subjective, but monitors, printers, lighting, print surfaces and other outside influences conspire to make a perfect match elusive. Calibrating your monitor is the first step you can take to improve print predictability.

Monitor calibration
Reliable color reproduction is critical. We use the latest scanners, software and color management

tools to ensure that the images you get from us are of the highest quality possible and that you see what the photographer intended you to see.
A properly calibrated monitor is a critical component in this procedure, so we re-calibrate our monitors weekly.

Our technicians use Barco Reference Calibrator monitors set at a color temperature of 6,500°K and balanced to D65, 1.8 gamma. This creates repeatable, consistent viewing conditions that conform to established standards in the graphics industry. But even with the best viewing conditions possible, a translation must be made between light transmitted through the tube and light reflected off the printed page. Nevertheless, we're able to accurately predict our output. Like comparing an image in a lightbox to a printed sheet, this process improves with training and practice.

We want you to experience image quality the way we do. Calibrating your monitor is one of the quickest, easiest and most significant steps you can take towards increasing your color-related productivity and peace of mind.

Remember to download our source profile—'Tiff RGB'—from this website. It comes from Heidelberg and we have adopted it as our RGB working space. Later on in this booklet, we will explain how to place the profile correctly.

Calibration and profile tips

Here are several ways (from good to best) to calibrate your monitor and create a profile:

- Use the canned profiles that came with your monitor.
  A caveat: This isn't the most reliable method, because monitors vary greatly in manufacturing and change with age.
- Use a system that mounts a colorimeter or spectrophotometer on your monitor. These devices start at around few hundred dollars but could save thousands of dollars on proofs.

Additional tips

- Staring at a monitor for long periods fatigues your eyes. Try blinking to reduce eyestrain.
- Clean your monitor before calibrating it.
- Let your monitor warm up for 15-30 minutes before calibrating it.
- Re-calibrate your monitor regularly.
- Stabilize your room lighting; keep your lighting as subdued and consistent as possible.
- Remove dimmers.
- Use grid diffusers to keep fluorescent lighting directed downward.
- Keep your monitor away from windows, or block the light when looking at critical color.
- Use a monitor hood to keep stray reflections off the glass.
- When viewing imagery on screen, try to wear dark clothing as this will help reduce reflection.

Step 2: Using ICC profiles

In most instances, you'll need two profiles (source and output) for a color-matching session. These profiles allow for the vital cross-platform communication of color information. In other words, using ICC profiles, machines of various manufacture, function and origin can speak the same color language.

The ICC's website (www.color.org) provides information about the group's current efforts, along with current profile specifications. See 'Canned vs. custom' below for further profile sources.

Putting profiles to work

Working closely with your service provider remains the best way to take advantage of ICC profiles and establish a reliable CMS. We've provided the means to get more consistent quality from your monitor, but keep in mind that this is only part of the workflow solution. In order to increase print predictability, you're also going to need either an output profile supplied by your printer or a canned profile that you've tested.

Canned vs. custom

As noted in Step 1, a significant difference exists between canned and custom profiles. Custom profiles are more accurate because many devices, printers for example, will ship with a canned profile that doesn't accurately reflect the specific behavior of the printer on your desk. The same goes for monitors and scanners.

Bottom line: canned profiles are better than nothing, but for accuracy's sake, if you can use a custom one, do so. You can obtain canned profiles from many manufacturers of scanners, digital cameras and printers, and from service providers.

There are additional locations on the web (see 'Online color resources' at the end of this guide) that provide device profiles and are also excellent resources for color management information.

Step 3: Sizing and scaling images

Pixels, halftones and image quality

For many, the relationship between pixels and halftone dots is very confusing. Plenty of controversy revolves around sizing and scaling images and how different raster image processors (RIPs), which convert vector graphics (images considered as lines rather than pixels) or text into bitmapped images, work with different programs.

Depending on how you plan to use an image and how demanding you are about image quality, sizing and scaling issues will vary in degree of importance and in implementation. Occasionally results, even with careful planning and calculation, can be surprising and apparently defy reason. For example: our images are routinely sized and scaled up to appear on large billboards. They end up looking fine in spite of calculations that tell you that this shouldn't be the case. This is partially because the viewing distance is normally around 100 yards.

Raster devices

Monitors are commonly set at 72-75 pixels per inch (ppi) and are referred to as raster devices because they display with scan lines. Many desktop proofers also print with raster data—ink-jet printers, dye-sublimation printers and copiers print without halftone screens in most cases and range between 200-1,400 ppi. (There are new large-format printers that can get away with clearly reproducing images at a resolution as low as 50 ppi.) This allows the raster device at each end of the printing process (monitor and printer) to communicate with the same ppi language when image-quality concerns come into question.

Establishing a ratio

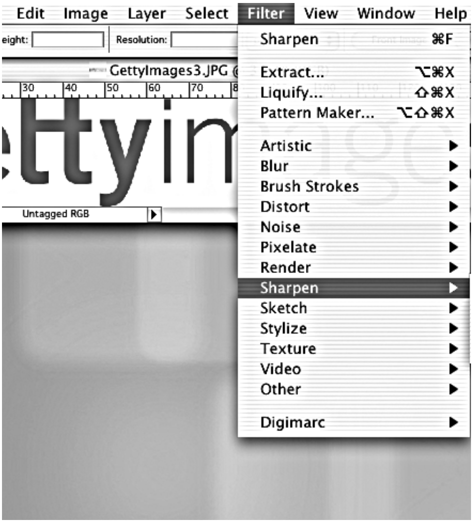
Traditional printing and halftone proofing devices use a halftone dot computed by establishing a ratio between ppi and lines per inch (lpi). To maintain high-quality images this ratio is 2:1; in other words, for an image to print with high quality at 150 lpi the digital file should be at 300 ppi. Despite this, acceptable results can be achieved all the way down to 1:1—primarily with less critical work on newsprint and other inexpensive paper.

Step 4: Sharpening images

Sharpening in the digital world

In the analog world, image sharpness (an image's degree of clarity) is an elusive ideal directly related to camera price. If you've ever compared a transparency from a high-end 35mm camera to that taken by an average one, you know what we mean. But when the image is captured digitally (digital camera or scanner), the tonal gradations of the image are converted into a grid of pixels that almost always needs to be, and can be, enhanced through digital sharpening.

Fortunately, in the digital world this is relatively easy to do. Today most image-processing programs have sharpening built-in, offering an inexpensive means to render images exactly the way you want. Determining just how much sharpening is needed, however, requires a fair amount of input from the user because it's subjective, and the amount of sharpening required can change relative to the image, the size it's used and the output process.



Unsharp masking (USM)

The commonly used term 'unsharp masking' is a holdover from traditional photographic processes used by color separators: a special piece of film was prepared that rendered an image purposely blurry. When combined with the original negative it increased contrast along areas where the tones

abruptly shifted. Today most scanners and software programs analyze only the digital information, not the actual image.

USM and Photoshop

Digital sharpening works by selectively adding contrast to edges, making the picture appear sharper. This is controlled by programs such as Photoshop that provide the following settings when using unsharp masking:

Amount: When the unsharp masking algorithm considers the pixels of an image, it notes areas of contrast. Then it adds density along the dark edge and subtracts density along the light edge. 'Amount' here refers to how dark and light these edges are compared to the original (increasing the amount makes dark areas darker and light areas lighter). We recommend you increase the default setting closer to 100 to begin experimentation.
Radius: This looks at the size of the area that will be affected. The larger the number, the greater the area affected. If your image includes lots of detail, keep this number low. We recommend you increase this number as file size increases. For a standard screen resolution, a radius setting of 0.5 works well; for a standard printing resolution, increase this number to about 1.5. Images with low tonal differences and without fine detail can be improved by increasing the setting to about 3.0.
Threshold: This determines what level of contrast to sharpen. At a setting of 0.0 the program looks at everything; as this number is increased it looks at less. This number becomes critical with flesh tones. Unless you'd like to see every pore, keep this setting over 6.0. A recommended base setting for print images is 125, a radius of 1.5 and a threshold of 3.0.

Sharpening tips

Sharpening should be the last operation, it's best to wait until the image is ready for output before determining sharpness. Flesh tones can look very bad if oversharpened. Sharpening is a subjective decision and should be based on printed tests images—files onscreen almost always look oversharpened. Expect the grain to increase when you sharpen.

Also worth noting

One of the most effective ways to sharpen your image is to convert it into CIE L*a*b* color. In this format the L, or luminance, channel has no color information, and sharpening it creates very smooth results and avoids the color fringing common on saturated images.
Most professional scanning programs such as LinoColor have additional controls that allow you to determine the intensity of the contrast on both the light and the dark sides.

Why we don't presharpen images

Images differ greatly and the intent of your design is something we never want to compromise or second-guess. A 'generic' level of sharpening limits your creativity, as we mentioned earlier, sharpening is subjective.
Printing environments and intent can vary widely. If we pre-sharpened our images, the quality of your print could be sacrificed. Different processes and environments require different amounts of sharpening and what looks good onscreen could look terrible in print, or vice versa.

We JPEG-compress all our images on the highest setting (least data loss, biggest file size) to ensure that the least amount of image quality is lost. If we pre-sharpened and then JPEG-compressed there's a strong chance the image would end up blotchy.

20019233-001 Jonathan Kim

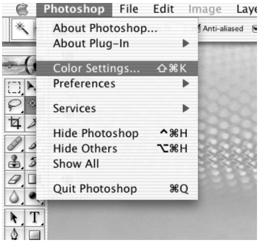
Step 5: Color conversions

This section shows you how to color convert using profiles in Photoshop. ***However, it is not intended to recommend particular settings because all workflows and environments differ and it would be an impossible task to cater for everyone.***

Why use profiles?
Profiles provide reference points for devices used in your workflow. They give Photoshop more information on color e.g. what color space an image was scanned into, and what color space the image will be printed in. When this information is known, Photoshop is able to convert more intelligently from one color space to another.
It provides more consistent, reliable results and also puts more control on your desktop, saving time and money.

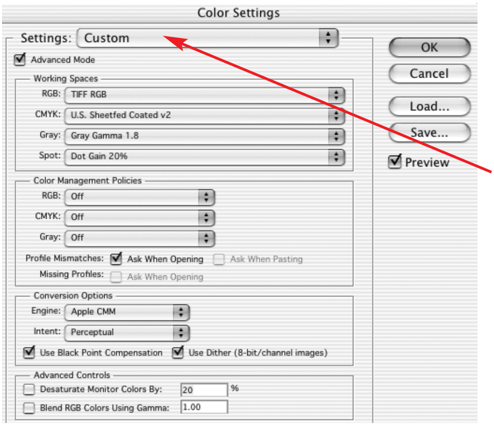
Where are profiles stored?
Mac OS 9 ICC profiles are stored in System Folder / Colorsync Profiles
Mac OS X ICC profiles are stored in Library / Colorsync / Profiles
On Windows 95/98 ICM profiles are stored in Windows / System / Color
On Windows XP/2000 ICM profiles are stored in Windows / System 32 / Spool / Drivers / Color
On Windows NT ICM profiles are stored in WinNT / System 32 / Spool / Drivers / Color

Please note:
Once you have installed a new profile, you will have to quit and relaunch your applications.
On all platforms delete any unused profiles. This will reduce launch time of your applications.
Try to avoid amending the profile name as this may cause problems. If you must change the name, use a program such as profile editor.

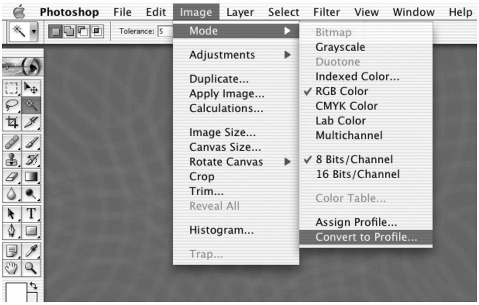


Photoshop 6, 7 and CS

To begin using profiles go to Photoshop / Color Settings Here you are given various choices based on the way you want to work. Unless you are fully knowledgeable on the subject of profiles, we recommend that you don't check the embed profiles boxes. There is now a handy description paragraph of everything to help you understand exactly what you are doing.



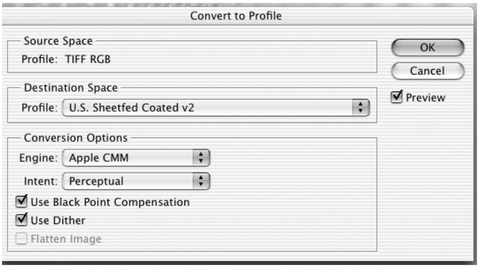
Instead of Custom Settings, Photoshop also has some pre-set profiles that you may find useful



RGB to CMYK conversions

Go to Image / Mode / Convert to Profile

The source color space is automatically detailed for you. In this case it is set to 'Tiff RGB' which is Getty Images' chosen color space. Then select the color space you want to convert into, e.g. choose the option that best suits your workflow.



You also get the choice of Engine and Rendering Intent. Take some time to test these fully and understand what kind of results you get using different settings.

Color glossary

Absorption
In printed media, it's the property that causes the surface to take up colorants in contact with it, such as ink. With digital media, it's the loss of light of certain wavelengths as it passes through a material and is converted into heat or other forms of energy.

Black point
When referring either to a monitor or a printer, the black point is the darkest point that it can achieve neutrally.

Brightness
Along with hue and saturation, brightness is an attribute of a color. It's the perceived quality of luminosity of a visible object.

Calibration
The process of ensuring that color reproduction devices are set to a known state, sometimes using industry standards or manufacturer's specifications.

Characterization
The process of creating an ICC profile that describes the unique color characteristics of color reproduction devices such as monitors, scanners, color printers and four-color presses.

Chroma
The amount of color in a color sample, e.g. gray has a chroma value of 0 while a neon sign has a high chroma value. Chroma is also referred to as Saturation.

CIE L*a*b*
A color model using lightness (L*) and two color values (a* and b*). The color coordinates define where a specific color lies in a Cartesian graph: the a* value defines the red-green axis and the b* value defines the blue-yellow axis. The L* value adds a third dimension to the color space.

Clipping
The severe transformation of colors re-purposed to another device's color gamut. These colors lie within the original color space but outside the destination color space.

CMM
Color Management Module. A set of color algorithms used to transform color values. The CMM is the engine that calculates color values based on predefined color characteristics in the ICC profiles.

CMS
Color Management System. This is system-level functionality that maps, or translates, the color space of one device to the color space of another. ColorSync on the Mac OS and ICM 2.0 on Windows are examples of CMSs.

CMYK
Cyan, magenta, yellow and black (key), the colorants used in the four-color process of subtractive, full-color printing.

Colorants
Materials such as pigments, dyes and inks used by a device, primarily a printer, to reproduce colors.

Colorimeter
A color-measuring instrument. The colorimeter uses a three-color model, usually RGB, to determine color characteristics of output devices. Colorimeters are usually used to calibrate and characterize monitors.

Color model
The dimensional coordinate system used to numerically describe colors. Some models include red, green, blue (RGB); hue, lightness, saturation (HLS); cyan, magenta, yellow, black (CMYK); lightness, a, b (Lab).

Color Separation
The conversion of red, green and blue (RGB) color data used by a computer monitor and transparencies into cyan, magenta, yellow, and black (CMYK) data that is used in the printing process.

Color spaces
A theoretical three-dimensional color system in which the axes of color, hue, saturation and brightness are represented.

ColorSync
An Apple system software architecture that enables system level color management in conjunction with ICC profiles.

Delta E
Distance in the CIE L*a*b* color space between two colors. The delta E variable can be used to test color tolerances within a color-managed environment.

Densitometer
An instrument used for reading the amount of light reflected by a surface or transmitted by an object. Densitometers are often used to measure the density of process-color inks on press. These density readings can then be used to calculate other values like dot gain and color difference (Delta E). By measuring emulsion densities, densitometers are also commonly used to analyze color characteristics of film.

Dot gain
Net percent increase in halftone dot size (or tone value) throughout the tone scale of a press sheet. Dot gain is a consequence of ink soaking into paper and spreading. A dot gain of 20% means that a 50% tint reproduces at 70% apparent dot area on paper.

DPI
Dots per inch (dpi) is measurement of output resolution referring to number of dots in an inch. Also applicable to setting scanner input.

EPS
Encapsulated post script (EPS) is a common way of saving an image, primarily suitable for saving illustrations from programs such as Illustrator and Freehand.

Gamma
In monitors, this is the logarithmic relationship between the voltage input and the brightness of a monitor. The brightness of the monitor in relation to the voltage input is expressed as $x^{2.2}$ where x is the voltage input and 2.2 is a power function called gamma. Gamma can be thought of as a hard-wired contrast curve.

Gamut
The total range of colors reproduced by a device. A color is said to be ‘out of gamut’ when its position in one device’s color space cannot be directly translated into another device’s color space.
For example, the total range of colors that can be reproduced with ink on coated paper is greater than that for uncoated newsprint, so the total gamut for uncoated newsprint is said to be smaller than the gamut for coated stock. A typical CMYK gamut is generally smaller than a typical RGB gamut.

GCR
Gray component replacement (GCR) uses black ink to replace cyan, magenta, and yellow inks. The black replaces neutral color values of the three colored inks throughout an image. The amount of black replacement is usually defined as a percentage GCR.

GIF
Graphic interchange format (GIF) is commonly used for graphics displayed on the world wide web, originally developed by CompuServe.

Halftone
In print, a pattern of various-size dots used to generate an illusion of varying densities or shades.

Hue
The basic color of an object, such as ‘red,’ ‘green,’ ‘purple,’ etc., defined by its angular position in a cylindrical color space, or on a color wheel.

ICC
The International Color Consortium (ICC) was established in 1993 by eight industry vendors for the purpose of creating, promoting and encouraging the standardization and evolution of an open, vendor-neutral, cross-platform color management system architecture and components. See www.color.org.

ICC Profile
A file that describes how a particular device (e.g. monitor, scanner, printer, proofer) reproduces color (ie. its specific color space).

Input, Monitor and Output Profile
An Input profile is used for a scanner or digital camera, a Monitor profile for an LCD or CRT display, and an Output profile for a printer or imagesetter.

Interpolation
A computer process that increases or maintains image resolution when the image is enlarged or reduced.

JPEG
Joint photographic experts group (JPEG) files are compressed data commonly used for file transportation.

Linearization
A specific type of calibration where an output device is adjusted to deliver a straight-line relationship between input and output.

Neutral colors
Black, white or gray—colors not associated with any single hue.

Pixel
A tiny picture element that contains red, green, and blue information for color rendering on a monitor or a scanner. When generating colors, pixels are similar to dots of ink on paper. A monitor resolution description in terms of pixels per inch (ppi) is similar to a printer resolution description in terms of dots per inch (dpi).

PPI
Pixels per inch (ppi) refers to the resolution of the digital file, pixels per inch.

Process Printing
Output from a printing press that uses four colors (cyan, magenta, yellow and black) to create the illusion of continuous tone images. For that reason, cyan, magenta, yellow and black are also known as process colors.

Proofer
A printing device used to simulate color achieved on press. A service bureau uses proofers to create images as contracts (also called a contract proof) to match in the final output from the offset press. Traditional analog proofers create prints from the actual separation negatives. Examples of these proofs are MatchPrint, Fuji color art, or cromalins. These proofers do not use the film used for the final print job. Instead they simulate color using ink-jet, dye-sublimation or other technology.

Render Intent
The method a CMM uses for converting (ie. mapping) colors from one device's gamut to another. The four methods are perceptual, saturation, relative colorimetric, and absolute colorimetric.

Soft Proofing
This is when you can view the finished file on your screen instead of having a hard copy e.g. digital match print or cromalin to view. Soft proofing can provide a very economical means of proofing.

Spectrophotometer
An instrument for measuring color samples at specified increments throughout the visible spectrum. Unlike densitometers and colorimeters, the spectrophotometers measure discrete wavelengths of light referenced to human perception. Spectrophotometers are the most common tool for measuring printed color samples used to create ICC profiles.

sRGB
Standard RGB is an RGB specification promoted by Microsoft and Hewlett-Packard. It specifies a gamma of 2.2 and a white point of 5,000ºK.

TIFF
Tagged interchange file format (TIFF) is one of the most common image formats.

TIFF RGB
This is Getty Images' color space, from Heidelberg.

UCR
Undercolor removal (UCR) involves the replacement of cyan, magenta, and yellow inks with black ink in the dark, shadowed areas of an image to lower the total amount of ink applied to the paper.

White Point
How white is reproduced. On a monitor it is the combination of all three red, green and blue primary colors at full intensity, as measured by its color temperature in ºK. Necessary as a reference point in calibration and characterization.

FAQs

What is Color Management and what will it do for me?

Color Management provides the ability to predict and control accurately image elements from one media or color space to another. It is very common for an image to be used on a website and output to various types of printing conditions, perhaps in different parts of the world. Conditions for different processes and vendors can vary widely. Color Management gives you the ability to re-purpose images with confidence. Your images will look as good as they can no matter what process is used for reproduction.

How does a CMS work?

Simply put, CMS use profiles, or mathematical descriptions of the color in devices, to transform the color between those devices. For example, the profile for the scanner and the profile for the monitor can negotiate the correct color from the scanner to display on the screen. This takes place through a color matching method from a variety of vendors at the operating system level on Macintosh computers and through some individual applications on Wintel machines.

What types of output are suitable from your digital files?

Getty Images digital files capture the full gamut of color and are never limited to what can be reproduced in standard four-color printing. Photographic output and extended range systems like Hexachrome will not be compromised when using our files.

Why not give customers files in CMYK?

There is a good chance that any CMYK file we would provide would not be appropriate for our customers printing needs. CMYK is extremely device-dependent. Paper, ink, press conditions, how you prepare the black (UCR-GCR) and numerous other variables determine what colors you can print. It is best for you to create your CMYK from our RGB files for the specific needs of your printing process.

Having said that, some of our third-party partners do offer CMYK files.

bf0119-001 Anthony Marsland

What is an ICC profile?

A profile is a data file that conforms to the International Color Consortium standard and represents a mathematical description of the range of colors a device can capture, display or print.

Why would I want to use profiles?

Profiles are the building blocks of Color Management. They provide a reference for devices used in your workflow. By creating these reference files, the profiles, you are able to adjust color throughout your workflow based on the unique characteristics of these devices.

How do I use the TIFF RGB source profile?

The source profile is a ColorSync/ICC mathematical description of the color in our files. The information in this file is used by Color Management aware applications to transform the color to your screen and to other output devices. It is the ‘from’ part of the ‘from/to’ equation. Because your CMS has a reference for the source data it is possible to convert very accurately to the RGB used on web pages and the CMYK used in proofing and printing applications.

What does the profile do to the images?

A profile does nothing to the image. A profile is a description of the color in the image. It communicates to a CMS so your monitor and other color devices can use the color in the image correctly.

Why doesn't the image on my screen look like the proof I received from my supplier?
Use the ColorSync Control Panel or the Adobe Gamma utility (OSX, use Monitor Preferences) to build a generic profile of your monitor. If you are anything more than a casual user, you can use a special tool, called a colorimeter.
If you decide to purchase a colorimeter, then this will create an accurate profile of your monitor.

Colors appear different in various lighting conditions so when viewing the proof, the light source must provide continuous white light, as this can play a big part in the color you perceive. We are confident that if you follow the guidelines and work in a well-controlled color environment, you will soon be able to make many of your color decisions from your screen in this stable environment.

My printer wants CMYK files, what is the best way to convert them?
There is really no such thing as standard CMYK. Paper, ink, linescreen, and numerous other variables can dramatically change the optimum CMYK file for a particular project. Talking to your printer can provide you with the information you need to make accurate CMYK files for final press output. Printers may also be able to provide you with an ICC profile for their printing process. You may also find alternative profiles that will work with your printer's output conditions. Bear in mind that custom profiles usually provide better results than generic profiles.

What kind of output devices can I profile?
Almost any type of output device can be profiled. Monitors, scanners, proofers, digital presses, offset presses, etc. Even film plotters and transparency/duratrans output devices can be accurately profiled.

Is my printer an RGB or CMYK device?
Most printers image using cyan, magenta, yellow, and black inks. Some of the latest printers use inks such as light magenta, light cyan and light black in addition to the standard CMYK inks. If these printers accept postscript files then it is probably best to profile these devices as CMYK devices. If your printers do not accept PostScript files it is probably best to profile these devices as RGB devices.

For more information on this please consult your printer manufacturer.

How does the profile benefit the customer?
The result of using the ICC Color Management technology and the TIFF RGB profile is greater control of color on your desktop and that can translate into savings in time and money. Our profile allows the user to accurately make assumptions about the true nature of the RGB color defined in our image files. Armed with this definition (profile), you can use Getty Images files in ICC-aware applications while keeping the image in a relatively device-independent state. This helps eliminate some unnecessary degradation in the RGB data.

Online color resources
www.color.org (ICC home page)
www.adobe.com
www.apple.com
www.gretagmacbeth.com
www.pantone.com
www.chromix.com
www.praxisoft.com
www.color.com
www.xrite.com
www.chromaticity.com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