

A GUIDE TO DIGITAL AND TRADITIONAL PRODUCTION TERMINOLOGY

TABLE OF CONTENTS

Section 1	
PRINT	2
Section 2	
WEB/SCREEN	8
Section 3	
TOOLS OF THE TRADE	12
Section 4	
FAQs	18
Section 5	
GLOSSARY	22

Print

Compared to web production, print production has remained relatively unchanged for decades. Though new techniques and technologies—such as digital and variable printing—do occasionally emerge, the trade still has its roots firmly embedded in tried-and-true methods used for generations.

COLOR SPACES

CMYK

In most industrial and commercial printing, the technique used to print full-color images, such as color photographs, is referred to as **four-color process printing**, because four inks are used: Cyan, a bright blue; Magenta, a vivid red-purple; Yellow and Black. Together, they are abbreviated as **CMYK** ('k' originally stood for Key). These four inks are mixed together using a basic printing technique known as **halftoning**, in which tiny dots of the four process inks are layered upon one another on press. When this is done, a simple optical illusion is created, causing the tiny halftone dots to be blended into smooth tones by the human eye.

The CMYK color space has a relatively small color gamut. Light, saturated colors often cannot be created with CMYK, and light colors in general can make the halftone pattern visible.

When building documents for printing, it is essential that all images and artwork use either CMYK or **Spot Colors** (see below). Any colors within the document or any images or other assets that are **RGB** will be reinterpreted by printers into CMYK mixes, resulting in undesirable shifts in color.

Spot Colors

Color printing can also involve one color ink, or multiple color inks which are not the primary colors. Using a limited number of color inks, or specific color inks in addition to the primary colors, is referred to as spot color printing. Generally, spot color inks are specific formulations that are designed to print alone, rather than to blend with other inks on the paper to produce various hues and shades. The range of available spot color inks, much like paint, is nearly unlimited, and much more varied than the colors that can be produced by four-color process printing. Spot color inks range from subtle pastels to intense fluorescents to reflective metallics.

The **Pantone Matching System**, often abbreviated PMS, is the industry standard color matching system used for defining and blending spot colors. Assigning each color in its system a numeric value, it accommodates designers and printers with swatches of over 700 colors and gives printers the formulas for making those colors. This assures the faithful reproduction and matching of specified colors, so long as the same Pantone inks are used, and regardless of printer.

Some printing presses are capable of printing with both four-color process inks and additional spot color inks at the same time. High quality printed materials, such as marketing brochures and books, may include photographs requiring process color printing, other graphic effects requiring spot colors (such as metallic inks), and finishes such as varnish, which enhances the glossy appearance of the printed piece.

RESOLUTION

Standard resolution for all images in a printed document is 300 **dpi** at 100%. In other words, at its full size, an image needs to contain at least 300 pixels per inch. See The Rules of Resolution in Section 3 for more. Large format graphics, such as banners, can often be printed as low as 100 dpi.

QUICK FACTS:

- If it's printed, it uses either the CMYK color space or spot colors.
- Standard resolution for all printed artwork is 300 dpi. Large format graphics can go as low as 100 dpi.
- Most files are sent to press as Adobe InDesign, Adobe Illustrator, or Adobe Acrobat PDF files.
- Average project turn-time—from start to finish—for printed pieces at OnMessage is 7-10 days from the time of release.
- Digital printing is faster, cheaper and more flexible, and most digital presses are limited to 12" x 18" sheets. Offset printing is higher quality and more effective when printing high volumes, and sheet sizes are much larger.

COMMON FILE TYPES

Raster:

- TIF
- JPG
- PSD
- BMP

Vector:

- AI
- EPS

Document:

- PDF
- INDD
- QXD

OFFSET VS. DIGITAL PRINTING

Offset lithography is the most common high-volume commercial printing technology. In offset printing, the desired print image is burned onto a plate and is then transferred (or offset) from the plate to a rubber blanket, and then to the printing surface. The image to be printed gets ink from ink rollers, while the non printing area attracts a film of water, keeping the non printing areas ink-free.

Digital printing eliminates many of the mechanical steps required for conventional printing, including making films and color proofs, manually stripping the pieces together and making plates.

Advantages of Digital

- Shorter turnaround.
- Every print is the same. This means more accurate counts, less waste and fewer variations, due to not having to balance ink and water during press run.
- Cheaper low volume printing. While the unit cost of each piece may be higher than with offset printing, when setup costs are included, digital printing provides lower per unit costs for very small print runs.
- Variable Data Printing is currently possible only with digital printing. See below.

Advantages of Offset

- High image quality.
- Works on a wide range of printing surfaces including paper, wood, cloth, metal, leather, rough paper and plastic.
- The unit cost goes down as the quantity goes up.
- Quality and cost-effectiveness in high volume jobs. While today's digital presses are close to the cost/benefit ratio of offset for high quality work, they still cannot compete with the volume an offset press can produce.
- Many modern offset presses use computer-to-plate systems as opposed to the older computer-to-film work flows, further increasing quality.

Still not sure which is right? Use this checklist to help decide:

- **Quantity**
Offset printing has a front-end cost load. Short runs may have a high unit cost. But as quantities increase, the unit cost goes down with offset printing. Very short runs can be much more cost effective with digital printing; while larger quantities are likely to have a lower unit cost with offset printing.
- **Printing medium**
Do you need or want a special paper, finish or unusual printing surface, or unique size? The options are increasing continually for digital, but offset printing still offers the most flexibility.
- **Color**
Digital presses use four-color process printing. If you need only black ink or one or two ink colors, offset printing may offer a more cost-effective solution. If you need four-color printing, digital may offer advantages in lower up-front costs.
- **More on color**
If you're planning to print using the Pantone Matching System, offset printing will give you the best match, since it uses actual Pantone ink. Digital printing simulates the color using a four-color matching process, so some digital printers may offer less accurate color matching on projects.
- **Turnaround**
If you need it fast, digital usually offers quicker delivery.
- **Proofing**
Digital offers accurate proofs since you see an actual sample of the printed piece. Accurate color proofing for offset printing can be expensive.
- **Customization**
Without question, digital printing offers the most affordable way to customize marketing materials, direct mail pieces, letters, etc.

VARIABLE DATA PRINTING

Variable-data printing is a form of printing in which elements such as text, graphics and images may be changed from one printed piece to the next, without stopping or slowing down the printing process. This is done using information from a database or external file.

For example, a set of personalized letters, each with the same basic layout, can be printed with a different name and address on each letter, or even a photo to match specific variable data.

Variable data printing is mainly used for direct marketing, customer relationship management, advertising and invoicing on self-mailers, brochures or postcard campaigns. The technique harnesses computer databases and software to create high-quality, full color documents, with a look and feel comparable to conventional offset printing. Variable data printing enables the mass customization of documents via digital print technology, as opposed to the 'mass-production' of a single document using offset lithography.

PAPER

Paper selection is an important part of the design process. Not only does each paper have unique aesthetic qualities, but the technical demands of the pressroom and bindery make paper selection critical. Papers respond differently to the rigors of production techniques such as **die cutting**, **embossing** and **foil stamping**. In addition, new digital printing technologies have added another layer of complexity to the mix.

Product end-use must also be taken into account:

- Will the paper be used in an offset or digital printing environment?
- Will it need to stand up to much physical handling?
- Will it be used and discarded, or required to last for many years?
- What postal requirements must be considered?
- Will envelopes be used?

Coated vs. Uncoated Paper

Coated paper is covered with a layer of clay and other substances that improve reflectivity and ink holdout.

Coated papers come in four finishes: cast coated, gloss, dull and matte. They tend to be smooth to the touch, and hold color more evenly.

Uncoated paper—also called offset paper—is paper that has not been coated with any additives. It tends to have a more textural, tactile feel. Its advantages include good internal bonding, high surface strength and its tendency to avoid curling.

Paper Weights

Paper is generally categorized by basis weight and by grade. For example: 70 lb. text or 100 lb. cover.

Basis weight is measured in pounds (often abbreviated with the # symbol), and is enumerated according to the weight of 500 sheets—or one ream—of a standard basic size. For example, the standard basic sheet size for text papers is 25" x 38". A ream of 70# text sheets in that size would weigh 70 lbs. The basic size for cover papers is 20" x 26".

Paper grades include bond, text, cover and bristol; in order of increasing thickness and/or weight. Bond paper is made of either cotton, wood pulp, or a combination of the two and is commonly used for printing bonds or legal documents. Text weight paper is heavier than bond paper and is commonly used for the interior pages of books and brochures. Cover paper is a heavyweight stock with good folding characteristics. Folders, business cards, brochure covers and pamphlets are usually printed on cover weight stock. Bristol stock is thicker still, and is often used in packaging.

Paper Finishes

Finish refers to the surface characteristics and tactile qualities of paper. Finishes can be applied to paper during the manufacturing process or produced offline. A finish such as laid can be created while it is being manufactured with the use of a marking roller that forms the pattern in the paper while it is still wet. Paper finishes provided offline are usually accomplished with steel rollers that press the pattern into the paper.

Some of the more common paper finishes are described below:

Felt

Felt is a soft texture on uncoated paper that is created during the paper making process with a either felt covered roller or with a rubber roller with a felt pattern that creates the finish. It can also be accomplished as an offline process. The felt finish does not affect the strength of the paper.

Gloss

A gloss finish produces a shiny and reflective surface on one or both sides of certain coated papers. A higher gloss is usually seen on higher quality coated papers. The gloss finish is produced from compounds added during the paper making process.

Laid

A laid finish has the appearance of translucent lines running horizontally and vertically in the paper. It is produced during the paper making process with a special roller that creates the pattern in the wet paper.

Linen

Linen finished paper resembles linen cloth and is usually produced after the paper making process as an offline embossing process.

Matte

A finish on certain coated papers that is smooth but with a dull appearance.

Metallic

Metallic paper is coated with a thin film containing metal or a thin film of plastic whose color and gloss simulate metal.

Parchment

A paper finish that has an old or antique appearance and is the result of washing sulphuric acid over the paper and then quickly neutralizing the acid wash. This process melts the outer paper fibres which fill the voids in the rest of the paper. Parchment is very durable and grease resistant.

Smooth

A smooth finish is the result of the paper passing through sets of rollers during the paper making process. This process is known as calendering.

Translucent

A semi-transparent finish that permits the passage of light through it. Often made from pure cellulose fiber, without the use of resins or other transparentizing agents.

Vellum

A vellum finish has an eggshell appearance and is consistent and even with a somewhat toothy finish. Vellum is one of the most popular uncoated finishes and paper with this finish has a high ink absorbency rate.

Wove

An even finish in uncoated paper with a slight texture made by a felt roller covered in woven wire.

BINDING METHODS

Saddle stitching

This is the most common bindery method. Employs one or more staples on the centerfold of nested [signatures](#)—or large sheets of paper which, when folded, are intended to form four or more leaves in the finished book—and is best used for projects with no more than roughly 60 pages or no thicker than 1/4". The total page count must be divisible by four.

Loop stitching

A variation of saddle stitching using a wire stitch, but when attached, creates a loop that extends away from the spine. Loop stitching allows the piece to be fit into a ring binder.

Side stitching

Involves stapling the stacked signatures together on the side of the spine, rather than through the centerfold, about 1/4" parallel to the outside edge. Pages will not lay flat when opened, but this provides a durable and inexpensive binding method.

Wire-O binding

Inner-connected metal teeth are fitting through pre-drilled holes along the edge to be bound and then latched to form a complete ring. The total page count must be divisible by two.

Spiral wire or Plastic spiral

A coated wire or plastic spiral is threaded through pre-punched holes along the edge to be bound. Book is able to lay flat when open, however crossover designs will not align across facing pages.

Plastic comb

Holes are punched into the pages along the bound edge and fitted with a pre-sized plastic spine with curved teeth. This method is less expensive and not as permanent as other methods, however imprinting on the spine of the comb is possible.

Perfect binding

A common binding method used for annual reports, books and larger catalogs. The inside center spine of the stacked signatures is ground, glued and then bound with adhesive to the cover spine creating a flat edge. Perfect binding requires a minimum of 1/16" thickness, 1/8" if spine is printed.

Lay-flat binding

A method similar to perfect binding but has the ability to lie flat by additional adhesives placed between the text pages and the cover. Lay-flat is good for use when hands-free reading is needed or the size of the spine is prohibitive for other methods. It is also more durable than standard perfect binding.

Case binding

The most durable of all methods. With case binding, the folded signatures are either collated and sewn, or bound with adhesive, and then attached to a hard cover. This method is commonly referred to as book-binding and is the most expensive of all bindery methods.

Sewn binding

With this method, gathered signatures are sewn together with thread through the center spine. In addition to its use with case binding, sewn binding can be used with soft-cover or self-cover books. It is often used for children's books or other applications where durability is a must. Signatures can also be sewn through the side of the book.

FOLDING METHODS

Accordion fold

An accordion fold is most commonly used in brochures. Its common characteristic is the "zig-zag" back-and-forth nature of the panels.

Gate fold

Gate folds are generally symmetrical, with two or more panels folding into the center from opposing sides like the hinged doors of a gate.

Map fold

As the name suggests, a map fold characteristically has several accordion folds and is built in a tall format that opens into a large continuous layout, rather than a spread. Maps are limited to lighter-weight stocks and may require special machinery configurations.

Parallel fold

The parallel folding family consists of styles with panels that stay parallel to each other.

Roll fold

A roll fold consists of four or more panels that roll in on each other. The roll-in panels must get incrementally smaller to be able to tuck into the respective panels. One of the benefits of a roll fold is that it can have multiple panels, but creates a compact package when rolled. Nicknames: barrel fold, over and over.

Web
&
Screen

In keeping up with the ever-changing world of technology, web standards and practices are in a constant and rapid cycle of evolution and obsolescence. As much as is possible, this section will attempt to cover many of the currently in-use tools, languages and technologies of web design and development. However, it is important to stay informed and up-to-date on these things, since they rarely stay the same for long.

COLOR SPACE

RGB

The **RGB** color model is an additive color model in which red, green, and blue light are added together in various ways to reproduce a broad array of colors. The name of the model comes from the initials of the three additive primary colors, Red, Green, and Blue.

In general, the RGB color model should be used when building any document or creative piece that is digital in nature, or that will not be reproduced using ink. In other words, if the end-product will be viewed on a screen or monitor and not on paper, use RGB.

The RGB color spectrum includes a broader gamut of colors than the CMYK color system. This is due to the additive properties of light used in RGB, as opposed to the subtractive properties of inks and pigments used in CMYK printing.

On the web, colors are often expressed in Hexadecimal code; a series of six alphanumeric characters that define a set of 216 **web-safe colors** in HTML code. This assures that the colors used can be viewed accurately by users with older monitors. Hexadecimal colors are always preceded by a '#' sign. Examples: #000000 (black), #9ACD32 (yellow-green), #FF0000 (red).

Typical RGB input devices are color video cameras, image scanners, and digital cameras. Typical RGB output devices are TV sets of various technologies (CRT, LCD, plasma, etc.), computer and mobile phone displays, video projectors, multicolor LED displays, and large screens like JumboTrons.

QUICK FACTS:

- If it is intended for use on the Internet or on screen, it uses the RGB color space.
- Standard resolution for all web-based artwork is 72 dpi.
- Standard website size is 800 x 600 pixels, though 1024 x 768 is becoming increasingly common.
- Web-friendly fonts: Arial, Courier New, Georgia, Times New Roman, Verdana, Trebuchet MS and Lucida Sans.

RESOLUTION

Standard resolution for all images and artwork used on the web is 72 dpi. See The Rules of Resolution in Section 3 for more. For web-based video, there is no universally standard resolution, though 320 x 240 pixels and 640 x 480 pixels are the most common. For PowerPoint presentations, standard resolution is 150 dpi.

COMMON FILE TYPES

Raster:

- GIF
- JPG
- PNG

Vector:

- SWF
- SVG

Document:

- PDF

Video:

- MOV
- AVI
- WMV
- MPEG

Audio:

- MP3
- AU
- AIFF
- WAV

Multimedia

- SWF

LANGUAGES

There are a number of different programming languages that are used, both independently and cooperatively, in the design, development and maintenance of a webpage.

HTML

HTML, which stands for HyperText Markup Language, is the predominant markup language for webpages. It provides a means to describe the structure of text-based information in a document—by denoting certain text as links, headings, paragraphs, lists, and so on—and to supplement that text with interactive forms, embedded images, and other objects commonly found on the web. In essence, HTML is the skeleton upon which a webpage is built.

HTML can also describe, to some degree, the appearance and semantics of a document, and can include embedded scripting language code (such as JavaScript) which can affect the behavior of web browsers and other applications that interpret HTML.

The World Wide Web is composed primarily of HTML documents transmitted from a web server to a web browser using the Hypertext Transfer Protocol (HTTP). However, HTTP can be used to serve images, sound, and other content in addition to HTML.

Cascading Style Sheets

Cascading Style Sheets (CSS) is a stylesheet language used to describe the presentation of a document written in a markup language. Its most common application is to style webpages written in HTML.

CSS can be used locally to define colors, fonts, text alignment and size, borders, spacing, layout, and other aspects of document presentation. It is designed primarily to enable the separation of document content (written in HTML or a similar markup language) from document presentation (written in CSS). This separation can improve content accessibility, provide more flexibility and control in the specification of presentation characteristics, and reduce complexity and repetition in the structural content.

Prior to CSS, document authors who wanted to assign typographic characteristics to, for example, all headings had to use the HTML font and other presentational elements for each occurrence of that heading type. This made documents more complex, and generally more difficult to maintain. But now, with CSS, an author can make a single change a style sheet, and that change will carry over to all objects or text that style sheet refers to.

The advantages of CSS for defining all aspects of the presentation of HTML pages are considered to be superior to older, HTML-based methods. It has therefore deprecated the use of all original presentational HTML markup.

Flash

Adobe **Flash** (previously called Shockwave Flash and Macromedia Flash) is a set of multimedia software created by Macromedia and currently developed and distributed by Adobe Systems. Since its introduction in 1996, Flash has become a popular method for adding animation and interactivity to webpages. Flash is commonly used to create animation, advertisements, and various webpage components, to integrate video into webpages, and more recently, to develop rich Internet applications.

Flash can manipulate vector and raster graphics and supports bi-directional streaming of audio and video. It is available in most common web browsers and some mobile phones and other electronic devices. Several software products, systems, and devices are able to create or display Flash, including the Adobe Flash Player.

Files in the SWF format, traditionally called “ShockWave Flash” movies, “Flash movies” or “Flash games”, usually have a .swf file extension and may be an object of a webpage, strictly “played” in a standalone Flash Player, or incorporated into a Projector, a self-executing Flash movie (with the .exe extension in Microsoft Windows).

Flash is becoming an increasingly popular method for displaying video clips on webpages. The key to this success has been the player’s wide distribution in multiple browsers and operating systems. It is available for many popular platforms, including Windows, Mac OS X and Linux, and is used as the basis for many popular video sites, including YouTube and Google Video.

Java

Fundamentally, Java is a programming language that allows people to write applets and executable applications. In a grander sense, Java is a platform, a full suite of tools that allows a programmer to create dynamic applications

for the web, for small devices like cell phones and PDAs, and for personal computers. Java can also be used to create small programs, known as “applets,” to be embedded in webpages. For instance, a webpage using Java could contain an interactive weather map, a live display of subway trains, or a video game, without the need for the web server to do all of the work.

Java’s primary advantage is its platform independence. That means that when writing code or building an applet, a programmer has to write Java code only once. Before Java, programmers had to write their code for each targeted operating system. If you wanted to write a poker game application and then distribute it to customers, you would have to write the program for Windows, again for Mac, and again for LINUX.

JavaScript should not be confused with Java. JavaScript, which originated at Netscape, is interpreted at a higher level, is easier to learn than Java, but lacks some of the portability and speed of Java.

ABOUT WEB FONTS

In order to ensure maximum compatibility of a webpage across various computers and operating systems, and due in large part to the limitations of HTML, web designers most often use what are known as [web-safe fonts](#).

Web-safe fonts are those fonts likely to be present on a wide range of computer systems, and are used by web content authors to increase the chance that content will be displayed in their chosen font. If a visitor to a website does not have the font specified by the webpage installed on their computer, their browser will select an alternative. This can often result in the browser defaulting to an undesirable font.

The list includes: Arial, Courier New, Georgia, Times New Roman, Verdana, Trebuchet MS (more recently) and Lucida Sans (to some extent).

Cascading Stylesheets (CSS) provide a solution, allowing authors to specify font family stacks to increase the likelihood of a satisfactory appearance. CSS defines five generic font families: serif, sans serif, cursive, fantasy, and monospace. These families can be used to suggest to the visitor’s browser the preferred style of typeface to use if none of those specified are available. Web authors can even go one step further and specify—in order of preference—the fonts to use in the event that the first specified font is not present on a visitor’s computer.

In order for fonts that are not web-safe to display correctly, they must be converted to raster graphics and placed in the webpage as images. However, too much of this can add size to a site and slow down its load time.

Flash also provides a limited solution, since it allows fonts to be embedded within Flash objects.

ACCESSIBILITY

Web accessibility refers to the practice of making websites usable by people of all abilities and disabilities. When sites are correctly designed, developed and edited, all users can have equal access to information and functionality. For example, when a site is coded with semantically meaningful HTML, with textual equivalents provided for images and with links named meaningfully, this helps blind users using text-to-speech software and/or text-to-Braille hardware. These guidelines are established by the World Wide Web Consortium; the main international standards organization for the World Wide web.

To be accessible, webpages and sites must conform to certain accessibility principles. These can be grouped into the following main areas:

- Use semantic markup that provides a meaningful structure to the document.
- Semantic markup also refers to semantically organizing the webpage structure and publishing web services description accordingly so that they can be recognized by other web services on different webpages.
- Use a valid markup language that conforms to a published DTD or Schema.
- Provide text equivalents for any non-text components such as images and multimedia.
- Use hyperlinks that make sense when read out of context.
- Don’t use frames.
- Use CSS rather than HTML Tables for layout.
- Author the page so that when the source code is read line-by-line by user agents (such as a screen readers) it remains intelligible.

Tools of the Trade

In this section, we'll take a look under the hood at the many tools, techniques and tricks-of-the-trade regularly used in the Creative Process. We'll cover everything from common file formats, to specific design software, to general rules of thumb.

RASTER/BITMAP GRAPHICS

Raster graphics, also known as Bitmap graphics, are composed of an arrangement of pixels stored within specified dimensions. Each pixel contains specific color information that determines how it will be displayed. A pixel is minutely small; a single image may be composed of hundreds of thousands of individual pixels. Much like cells revealed from a piece of tissue when seen under a microscope, these pixels are only clearly and individually visible when the image is magnified. But when viewed in their respective arrangements from a distance, these grids of pixels are combined visually by the human eye, like an optical illusion, to produce a photographic image.

Raster graphics are ideal for photographic images where there are thousands, even millions of different colors. Complex fills, shading and gradient effects can easily be rendered. The Bitmap image offers as much freedom as an empty canvas.

Raster graphics are the most common graphic format in use on the web and on the computer. With the exception of Flash and the still relatively unsupported SVG (scalable vector graphic) format, every single graphic seen on the web is a raster graphic.

Advantages of Raster Graphics

- Only format that will show smooth gradients and subtle detail necessary in photographic images.
- Allow for color correction much easier than vector images.

Disadvantages of Raster Graphics

- Resolution-dependant.
- Relatively large file size.

Common Raster File Formats

Among the most common raster file formats are TIFF, JPG, PSD, BMP, and GIF.

QUICK FACTS:

- Examples of raster graphics: photos, screenshots, scans.
- Examples of vector graphics: logos, one or two-color graphics.
- It is safe to decrease a file's resolution, but not to increase it.
- Vector graphics can be freely resized and altered without respect to resolution. Raster graphics cannot.

VECTOR GRAPHICS

If we consider Bitmap graphics as being stored in a literal fashion, then **vector graphics**, stored representatively, are their opposites.

Rather than being composed of pixels, vector graphics consist of points, lines, and curves which, when combined, can form complex objects. These objects can be filled with solid colors, gradients, and even patterns.

Vector graphics are defined by mathematical equations. For this reason, the programs that are used to create them save instructions on how the image should be drawn, rather than how it looks. This is the key difference between the two types of graphics. Because the computer has a description of how the image should look, it can be redrawn at any size, in any position, without losing any quality. A vector graphic resized to five times its original dimensions is simply reproduced, exactly, at the new size. It can also be freely manipulated without losing coherence, like a rubber band that can be stretched an infinite number of ways.

The price of this scaling flexibility is that vector images must remain relatively simple in comparison to Bitmap images. It is impossible to render the nuances of a photographic image in a vector editor; as a result, illustrative vector graphics have a distinct look and feel, even when produced in detail.

However, vector graphics are ideal for producing artwork which frequently needs to be presented in different sizes or colors. Logos and line art especially fall into this category. A logo produced with a vector application can be blown up to fit on a billboard or scaled down to adorn a letterhead with no loss of quality.

Advantages of Vector Graphics

- Resolution-independent.
- Relatively small file size.

Disadvantages of Vector Graphics

- Do not permit the level of visual complexity and detail that raster graphics do.

Common Raster File Formats

The most common vector file formats are AI, EPS, and SVG.

THE RULES OF RESOLUTION

In Bitmap graphics, there is an immutable connection between pixels and the image they compose. When a Bitmap graphic is saved, the computer is really saving an exact visual picture of the image: this pixel goes here and is this color; this pixel goes there and is that color, and so on and so on.

This connection is responsible for the effects seen when resizing a bitmap graphic. Given three image sizes—an original, one smaller, and one larger—each will naturally contain a different number of pixels. When an image is resized, its pixels do not change sizes, only the image does. It takes more pixels to fill the volume of a larger space, and fewer to fit into a smaller space.

Making an existing Bitmap graphic smaller is a process of reduction; pixels are removed from the image until it fits the new size. Computers are well equipped to perform this task. An image can be sized smaller repeatedly and still maintain the same quality, up until the point where there are not enough pixels available to reproduce the image clearly.

At any given size, a Bitmap graphic contains exactly the amount of information (i.e. pixels) required to display it. No more and no less. Therefore, increasing the size of a Bitmap graphic is akin to pouring a drink from a smaller glass into a larger one. For the drink to occupy the full volume of the larger glass, we must add additional fluid. The original concoction is diluted, and the flavor weakened.

In the same way, the computer must add additional pixels to the original image to allow it to fill the new larger area. Since there is no source for this information, it must be interpolated based on what is currently available in the image. In other words, the computer has to take a guess. Because the computer is not especially skilled at guessing games, Bitmap images that have been scaled larger quickly begin to degrade in quality, frequently showing signs of blurring or other undesirable visual effects. After extreme size increases, the image becomes increasingly pixelated and individual pixel “blocks” are more apparent (as though we held a magnifying glass up to it). Slight blurriness can be combated by sharpening the image with the filters provided within many graphic programs, but an enlarged image will never be as clear as the smaller original.

In order to prevent such a loss in visual quality, a counter-balancing adjustment must be made between an image's size and its resolution. Simply stated; in order to prevent loss of image quality by maintaining the same pixel dimensions, any incremental increase in an image's size must be accompanied by a reciprocal decrease in the image's resolution, or vice-versa.

For example:

An image that is 300 dpi at 1" x 1" has the same pixel dimensions as an image that is 100 dpi at 3" x 3". So, if we want to increase the image's size to 3" x 3" (i.e. by a factor of three), then we must decrease its resolution to 100 dpi (also by a factor of three).

Another example:

Let's say we have a photographic image on the cover of a brochure that we need to be 300 dpi—standard print resolution—at 8.5" x 11". But let's say the image is a stock photograph that was created as a large 72 dpi file. How do we know if the image is high enough in resolution to be printed? Simple. Since we know that the image must be at least 8.5" x 11" at 300 dpi, we would need to know how big that is at 72 dpi. We would find out by dividing 300 by 72, in this case giving us a factor of 4.17. We would then multiply the dimensions of 8.5" and 11" by that same factor, giving us 35.4" x 45.8". So, in order to be 8.5" x 11" at 300 dpi, a 72 dpi image must be 35.4" x 45.8".

There are numerous programs available for use in developing creative media of all types, but the most commonly used and supported is a software bundle known collectively as Adobe Creative Suite.

Adobe Creative Suite is a collection of graphic design, video editing, and web development applications made by Adobe Systems. As of this writing, the latest version is Adobe Creative Suite 3 (CS3). The major programs included in the CS bundle are discussed in detail below.

Adobe Photoshop

Photoshop is the current and primary market leading program for raster image manipulation, and is the flagship product of Adobe Systems. It has been described as “an industry standard for graphics professionals.” Like most Adobe products, Photoshop comes equipped with a robust and highly customizable tool palette. This allows for the detailed manipulation of raster images using everything from filters and clipping masks to custom brushes and adjustment layers.

Adobe Illustrator

Also considered an industry standard, Illustrator is the premier vector graphics editing tool on the market. Though its primary function is the creation and editing of vector graphics, Illustrator also has a limited toolset for manipulating type and page layout. However, InDesign is in most cases a more suitable tool for these purposes. Illustrator imports over two dozen formats (including PSD, PDF, SVG). It exports AI, PDF, SVG, SVGZ, GIF, JPG, PNG, BMP, and SWF.

Adobe InDesign

InDesign is a desktop publishing (DTP) application used primarily in creating and laying out multi-page documents, periodical publications, books, posters, and other print media. Designed as a successor to Adobe's discontinued PageMaker program and a direct competitor with Quark XPress, it was the first DTP application to support Unicode for text processing, advanced typography with OpenType fonts, advanced transparency features, layout styles, optical margin alignment, and cross-platform scripting using JavaScript.

Adobe Acrobat

Acrobat is a family of computer programs designed to view, create, manipulate and manage files in Adobe's Portable Document Format, or PDFs. Some software in the family is commercial, while some is freeware. Adobe Reader (formerly Acrobat Reader) is available as a no-charge download from Adobe's website, and allows the viewing and printing of PDF files. Only the full version of Acrobat, however, allows the user to create or edit PDFs. Acrobat and Reader are widely used as a way to present information with a fixed layout similar to a paper publication.

Adobe Flash

Previously called Shockwave Flash and Macromedia Flash, Adobe Flash is a set of multimedia software created by Macromedia and currently developed and distributed by Adobe Systems. Since its introduction in 1996, Flash has become a popular method for adding animation and interactivity to webpages; Flash is commonly used to create animation, advertisements, and various webpage components, to integrate video into webpages, and more recently, to develop rich Internet applications.

Adobe Dreamweaver

Dreamweaver is a web development application originally created by Macromedia and now owned by Adobe Systems, which acquired Macromedia in 2005. Dreamweaver has replaced Adobe's GoLive as the company's primary web development tool. Recent versions have incorporated support for web technologies such as CSS, JavaScript, and various server-side scripting languages and frameworks including ASP.NET, ColdFusion, and PHP.

TYPOGRAPHY

Typography is defined as the art and technique of arranging type. It is a well-established artform, with roots reaching back thousands of years before the Gutenberg Press to the ancient world. Being too broad a subject to cover in its entirety in this text, we'll stick to the basics.

Serif vs. Sans Serif

A **serif** typeface is a typeface that has an extra stroke at the end of the vertical and horizontal strokes of the main letterform. It was once believed that serif fonts were more readable than sans-serif for large blocks of printed body copy, but this theory has since been disproven. Examples of serif typefaces include Times, Garamond, Goudy and Palatino. The font you are reading right now is serif.

Meaning “without feet,” a **sans serif** typeface lacks the serif stroke at the end of the horizontal or vertical strokes of the main letterform. Before the term “sans serif” became standard in English typography, a number of other terms had been used. One of these outmoded terms for was “gothic,” which is still used today in font names like New Century Gothic. Common examples include Arial, Helvetica and Verdana. The large green typeface used in the headlines of this document is sans serif.

Font vs. Typeface

Though these two terms had more clearly differentiated meanings before the advent of desktop publishing, they are often mistakenly used interchangeably today.

Strictly speaking, a typeface is made up of a set of characters that share certain design features such as x-height, serif shape, stress, and contrast in stroke weights. Helvetica, Garamond, Arial and Century Gothic, for example, are typefaces. When you look at a sentence printed in a book or magazine, or displayed onscreen, you are seeing text in a particular typeface.

A font is traditionally defined as a complete character set of a single size and style of a particular typeface. For example, the set of all characters for 9 point Garamond italic is a font, and the 10 point size would be a separate font, as would the 9 point regular (upright). In the early days of typesetting, a font was a collection of small metal blocks separately designed and cut from a master, and the characters underwent subtle changes from one size to another. Later, a font was a filmstrip that was used like a light stencil to expose images of characters onto photographic film. Now fonts are chunks of computer code.

Times New Roman regular, italic, bold and bold italic are four fonts, but one typeface.

Types of Fonts

PostScript

The PostScript font format was developed by Adobe in the 1980s, several years before the release of TrueType. The format is based on Adobe’s PostScript printing technology; a programming language that allows for high-resolution output of resizable graphics. PostScript has long been viewed as a reliable choice, particularly for professional designers, publishers and printers.

PostScript fonts consist of two parts, a screen font and a printer font, both necessary for the font to be properly printed and displayed on screen. With most operating systems, PostScript fonts can be installed simply by being placed in the system’s font folder. However, PC users working on operating systems that predate Windows 2000, need to install special software in order to use PostScript fonts.

TrueType

This font technology was developed by Apple Computers and adopted by Microsoft. Like PostScript, TrueType fonts are scalable to any size without a loss of quality. Unlike PostScript fonts, however, they contain all their information—bitmap and vector—within one digital file.

OpenType

OpenType, a joint effort from Adobe and Microsoft, is the latest font format to be introduced. Like TrueType, OpenType fonts contain both the screen and printer font data in a single component. However, the OpenType format has several exclusive capabilities including support for multiple platforms and expanded character sets. OpenType fonts can be used on either Macintosh or Windows operating systems.

FAQs

HOW BIG OF A FILE IS TOO BIG TO EMAIL?

There really is no universal target number for file size. Different web hosts and mail servers have different restrictions placed on the maximum attachment size that you can send. Windows Mail, for example, limits file attachments to 10MB. Gmail tops out at 20MB.

In general, however, it is best to err on the side of caution and avoid sending anything via email that is over 4MB in size. If something larger absolutely must be sent, and you are unfamiliar with how to use an [FTP](#) client, there are several websites that might be of help. Sites like www.yousendit.com or www.dropsend.com allow you to send much larger files without using email.

WHAT DETERMINES IF SOMETHING IS HIGH-RESOLUTION OR NOT?

Once again, there is no implicit rule here. There is no magic number over which something is dubbed “high resolution.” It is important to remember that resolution is relative. What you ought to be concerned with when determining if an image is large enough for its intended use is not its resolution, but its pixel dimensions.

Remember the Rules of Resolution. An image’s pixel dimensions are determined not just by its resolution, but by its size at that particular resolution. It is not enough to say something is “high-res” simply because it is 300 dpi, because it could be just 1" x 1" at 300 dpi. That’s not very big, especially for an image intended for print. That same image would be ideal for use on the web though, since it would be about 4" x 4" at 72 dpi.

If you want to know if an image is large enough for a certain use, you need to know its target resolution—300 dpi for print, 72 dpi for web—and the final output size of the image. If the image meets or exceeds its final output size at its target resolution, then it is suitable for use.

WHAT ARE LAYERED FILES?

A layered file is any image file—vector or raster—in which the different visual elements are arranged by the application (Photoshop, Illustrator, etc.) in a series of overlapping levels, or “layers.” If an image is to be edited in any way, it is typically done using layers. Virtually all graphic editing applications allow their users to build files using layers.

Using layers is advantageous for several reasons:

- Maximum editing capabilities are preserved.
- Elements can be created or edited on one layer at a time, and without disturbing the elements on other layers.
- Certain visual effects to be applied to an image by adjusting the properties of different layers.

Merging all the layered artwork in a file into a single layer is called “flattening.” Doing so with a raster image means the file can no longer be edited. It is considered a good practice to flatten all artwork before going to press.

WHAT IS THE PROCESS FOR GETTING A DOCUMENT PRESS READY?

In no particular order, the following steps should be taken in order to prepare a document to go to press:

- All fonts used in the document should be collected into a single folder. Be sure to include this folder when sending the files to the printer.*
- Do the same for all images used.*
- All **bleeds** must be pulled out, typically to 1/8 of an inch beyond the edge of the page.
- Ensure that all images are high-res, CMYK and flattened. TIFF is the preferred file format for raster files.
- Likewise, ensure that all vector files are CMYK and that all fonts used in them are either converted to outlines or embedded.
- If spot colors are to be used on press, specify all Pantone colors. If not, convert all spot colors to CMYK.
- On some occasions, it is helpful to provide the printer with a mock-up of the finished piece. These are especially helpful for jobs that use complex folds, or on books, brochures or catalogues with high page-counts.
- Any scores, folds, die-cuts, embossing or other special printing techniques should be indicated in either the document itself, in a separate PDF, or on the mockup.

* Both InDesign and Quark XPress have the ability to perform these steps automatically, using either the Collect for Output (Quark) or Package (InDesign) commands.

WHAT IS THE PROCESS FOR GETTING A WEBSITE READY TO RELEASE FOR DEVELOPMENT?

In order to convert design comps into a living, breathing website, a web developer will need the following:

- The original design files.
- All fonts used. As in print, it is best if they are collected into a single folder.
- The same goes for all images used.
- Ensure that all raster images are RGB and flattened.
- A document or storyboard that explains basic navigation, interactivity, animation and other complex, dynamic functionality.
- A sitemap or other document detailing site structure and navigation.
- FTP access to the host [URL](#).

WHAT IS THE STANDARD AMOUNT OF PRINT OVERRUNS?

The standard industry allowance is +/- 10%. Printers plan for overruns in order to compensate for estimated spoilage or other printing problems so the specific quantity ordered can be delivered.

WHAT QUALIFIES AS MACHINABLE MAIL?

Any mail that can be placed through the U.S. Postal Service's automated mail processing system must meet certain requirements for size, weight and material before being classified as "machinable."

The list of requirements for machinable mail is quite lengthy, and could very easily occupy several pages of this text. For the sake of brevity, here are the size standards for the most common of mail pieces; the machinable letter.

Physical Standards for Machinable Letters:

- Not less than 5 inches long, 3-1/2 inches high, and 0.007-inch thick.
- Not more than 11-1/2 inches long, or more than 6-1/8 inches high, or greater than 1/4-inch thick.
- Rectangular, with four square corners and parallel opposite sides. Letter-size, card-type mailpieces made of cardstock may have finished corners that do not exceed a radius of 0.125 inch (1/8 inch).

For a complete list of machinable mail standards, you can visit the U.S. Postal Service website:

<http://pe.usps.gov/text/dmm300/201.htm#wp1042477>

WHAT IS THE DIFFERENCE BETWEEN AN ANIMATED GIF AND THE ANIMATION USED IN FLASH?

Though these two file formats are the most common forms of animation on the web, they actually have very little in common.

Animated GIFs

GIF files are capable of storing multiple images in one file. When accompanied by control data, those images can be cycled through at predetermined speeds, creating simple animations. Thus the term [animated GIF](#).

GIF is a raster image format capable of displaying a maximum of 256 colors. These color limitations make GIFs unsuitable for reproducing color photographs, which can contain millions of colors. They are better suited for simple images such as graphics or logos with solid areas of color.

They are extremely popular on the web because many applications are capable of creating them, and they remain the only animated image format capable of being rendered in nearly all modern web browsers without the use of a plug-in.

QUICK FACTS:

- If it is over 4MB in size, don't email it.
- Animated GIFs are suitable only for simple animations, while Flash animations can be more dynamic.
- Many factors contribute to how a website or email looks on any given computer.
- Most design, spreadsheet and word processing applications can create PDFs.

GIF animations are relatively crude. Like a flipbook, they are simply several static frames put together and played in sequence in order to simulate animation.

Animated GIFs also do not permit the use of audio, true video, or interactive elements.

Flash

Flash has become a popular method for adding animation and interactivity to webpages. It is also used to create advertisements, to integrate video into webpages, and more recently, to develop rich Internet applications.

The inclusion of a robust and customizable toolset allows Flash animations to be far more dynamic and complex than anything an animated GIF can create. In order to view Flash animations, it is necessary to download and install additional software (i.e. the Adobe Flash Player).

Flash can manipulate both vector and raster graphics. Artwork can be imported from other graphic editing applications such as Photoshop and Illustrator and can be output at any resolution the user specifies (within reason, of course).

Flash files also support bi-directional streaming of audio and video, and can include interactive elements such as buttons and text fields.

WHAT SPECS NEED TO BE KNOWN WHEN DESIGNING A WEBSITE?

- How big will the site be in pixel dimensions? 800 x 600? 1024 x 768?
- How many total pages of content will there be?
- Does the site require advanced functionality? This includes database functionality (Access, Filemaker Pro, Microsoft SQL, Oracle Server), search features, online games and interactive demonstrations, online chat and message boards, blogging capabilities, content management systems, and more.
- Does the client desire graphics interactivity and/or multimedia? These typically include JavaScript rollovers and effects, animated GIFs, QuickTime or AVI movies, sound files, PDF downloads, Flash animations, and interactivity.
- Are there requirements for e-commerce, such as the ability to process credit card transactions, development of Shopping Cart strategies, survey forms, and advanced sales selectors?
- Is the site to be hosted in-house or with another provider? If in-house, the client's information services department should be included in the planned meetings.
- Does the site need to be coded in a special language such as Microsoft ASP or Allaires Cold Fusion?
- What functionality, file sizes, and bandwidth does their web host support?

WHAT IS THE DIFFERENCE BETWEEN A LANDING PAGE AND A MICROSITE?

A landing page is whatever webpage that a sponsored link, display ad, click-to-play video ad or any other type of online promotion points to. They are often only a single page.

Microsite is a term referring to an individual webpage or cluster of pages which are meant to function as a supplement to a primary, or "parent" website. They are typically used to add a specialized group of information either editorial or commercial in nature. Microsites are often used for commercial purposes to create in-depth information about a particular product or service, such as describing a new technology. A car manufacturer, for example, may present a new hybrid vehicle and support the sales presentation with a microsite specific to explaining hybrid technology.

With the prevalence of keyword contextual advertising, (more commonly referred to as Pay Per Click or PPC), microsites may be created specifically to carry such contextual advertising. Or along a similar tactic, they're created in order to specifically carry topic-specific keyword-rich content with the goal of having search engines rank them highly when search engine users seek such content topics.

WHY DO EMAILS AND WEBPAGES LOOK DIFFERENT IN DIFFERENT PROGRAMS OR ON DIFFERENT COMPUTERS?

There are a wide range of external factors that will affect how a webpage or email will look to any user.

The User's Computer

The type of hardware and software you use on your computer will affect how a webpage or email is displayed. For a start it depends on the operating system you use. PCs and Macs use a different dots-per-inch (dpi) measurement which means text usually displays larger on a PC. On Macs text is **antialiased** which gives a smooth appearance whereas only the most recent PC operating system does this. PCs and Macs also use different screen brightness, and this means that designs will look brighter on a Mac. Different operating systems also use different sets of widgets—things like buttons and text boxes on forms and scroll bars on pages—so these elements will also look different depending on the platform you use.

Color can also be an issue. Different monitors have different color depths (the number of colors they can display), and simple factors such as the ambient light where a person's monitor is located can have an enormous affect on the perceived color. Web designers only have around 216 colors they know will be available across all modern computers, so if your corporate colors are not amongst them, they may not always be accurately represented.

User Preferences

Because it's impossible to tell what preferences a user has set on their computer, the way a page displays often comes down to the user's settings.

The screen resolution you choose will dictate how big everything looks and how much will fit on a page, with the most common screen resolution settings being 800 × 600 and 1024 × 768.

Text size is another problem. Aside from the differences in text size created by screen resolution, text size can also be changed by the user. In any case, it's not desirable to fix the text size. If users find your text too small to read, you don't want to stop them from resizing it.

Most browsers give the user the ability to set a custom user style or interface. This allows users to override how a website looks and gives them the ability to change things like background color, text color, etc. This is most commonly used by people with visual disorders such as color blindness.

Different Browsers

There is no universal standard for the ways in which web browsers or email programs read and interpret HTML. Each web browser looks at the code used and tries to interpret how the page should be displayed in different ways. Some browsers will display the page exactly as the designer intended and others won't.

Another problem is the use of unsupported or non-standard code. During the early years of the Internet, browser manufacturers stuffed their browsers with features that weren't supported by other web browsers in a race to win market share. Over time some of these features (such as image support) have become standard parts of HTML, while others (such as the marquee and blink tags) only work on specific browsers.

For example, many web designers use HTML tables to control page layout. To allow people to make a table stretch the height of a page, IE introduced the 'height' attribute for a table tag. This was a commonly used attribute for many years. Unfortunately it wasn't a standard tag so Netscape and other browsers didn't support it. The use of such non-standard code led to pages that only worked on one web browser, and even now you will see pages that only work in a certain browser.

Thankfully most modern browsers have decided to use a standard set of code. However, many web designers are still using non-standard tags which can cause display problems across a wide variety of browsers.

HOW IS A PDF MADE?

Most of the currently available design, layout, spreadsheet and word processing applications have the ability to create PDFs. This includes Adobe Illustrator, Photoshop and InDesign, and Microsoft Word and Excel.

Each application handles it differently. Photoshop and Illustrator can simply "Save As" a PDF. InDesign must "Export" a document into a PDF format. Word and Excel make use of the "Print" menu, changing the destination printer to Adobe PDF.

But no matter how you do it, you must also have a PDF creation tool—such as Adobe Acrobat—installed.

Glossary

AI — Abbreviation for Adobe Illustrator. Also the default file format of all Illustrator-native documents.

ANIMATED GIF — A GIF file created to display multiple images in a rotating and pre-determined sequence of frames. Animated GIFs remain widely used as many applications are capable of creating the files, and it remains the only animated image format capable of being rendered in nearly all modern web browsers without the use of a plug-in.

ANTI-ALIASING — Smoothing or blending the transition of pixels in an image. Anti-aliasing the edges on an image makes the edges appear smooth, not jagged.

AQUEOUS COATING — A water based coating which is applied on-press in the same manner as ink. It is used to protect and enhance the printed piece.

BLEED — The printed area of a page that extends beyond the final trim size to ensure the ink runs fully to the edge of the page and does not stop short of it.

BLUELINE — A prepress photographic proof made from stripped negatives showing color breaks as shades of blue. Also a generic industry term for proofs made from a variety of materials with similar appearances.

CAMERA RAW — A file containing minimally processed data from the image sensor of a digital camera or image scanner. Raw files are so named because they are not yet processed and ready to be used with a bitmap graphics editor (such as Photoshop) or printed. Normally, the image will be processed by a raw converter where precise adjustments can be made before conversion to an RGB file format such as TIFF or JPEG for storage, printing, or further manipulation. Raw image files are sometimes called digital negatives, as they fulfill the same role as film negatives in traditional chemical photography: that is, the negative is not directly usable as an image, but has all of the information needed to create an image.

CMYK — Short for Cyan, Magenta, Yellow and Black; the four color plates used in four-color process printing. Also the digital color space used by all files to be printed.

COATED PAPER — Paper with a coating of clay and other substances which improve reflectivity and ink holdout. Coated papers come in four finishes: cast coated, gloss, dull and matte.

COLLECT FOR OUTPUT — Also called packaging or preflighting. To gather all the assets needed for a project to print or launch successfully. Typically done before going to press or launching a website.

The term comes from the page layout program QuarkXPress. In Quark, performing the Collect for Output command results in all fonts and images used in a document being placed in a common folder, along with a copy of the document itself. That folder is then handed over to a printer, containing everything needed for the project to go to press. The term is also used, though not quite accurately, in web design.

COMP — A mockup or simulation of a final, printed product. They are especially helpful as visual aids for planning and troubleshooting a job for printing.

CONVERT TO OUTLINES — A process by which text is rendered thereafter uneditable and reinterpreted as shapes, rather than letterforms. Doing so removes the need to include any fonts a document contains when sending it to other users (a printer, for example). Typically done in Adobe Illustrator.

CSS — Abbreviation for Cascading Style Sheet. A feature of HTML that allows both web designers and end users to create style templates (sheets) that specify how different text elements (paragraphs, headings, hyperlinks, etc.) appear on a webpage. Currently, not all browsers express CSS formatting in the same manner.

DIE CUT — Irregular shapes cut out of paper using sharp steel rules in the shape of an image.

DIGITAL PRINTING — Printing by plateless imaging systems that are imaged by digital data from prepress systems. Their ability to print without films and plates enables them to create personalized short runs, and allows for the changing text, images and jobs without having to stop the press.

DMG — The DMG file format is used on the Macintosh operating system, OS X. It is used to archive and compress files to maintain their integrity for transportation, particularly via the Internet. Opening a DMG archive will mount the files on a virtual volume known as a disk image.

DPI — Short for dots per inch, it is the measure of the resolution of input devices such as scanners, display devices such as monitors, and output devices such as laser printers, imagesetters and monitors. DPI is the number of dots (or pixels) that fit horizontally and vertically into a one square-inch. The more dots per inch, the more detail is captured and the sharper the image.

EMBOSS — A process by which part of all of an image is pressed into paper so it is raised above the surface. This is typically done on-press with a combination of heat and pressure on the paper, using a metal die usually made of brass and a counter die that fit together and actually squeeze the fibers of the paper.

In printing it is used as an accent process and can be used in conjunction with ink (called register embossing) or with no ink (called blind embossing). To reverse the process, pushing part of the paper downwards so that it lies below the surface, is called debossing.

EPS — An Encapsulated PostScript (EPS) file is a self-contained PostScript graphic file that contains vector and/or raster image data. 'Encapsulated' means that graphics applications, such as Adobe Illustrator or Photoshop can use the information contained within the file itself to lay out a page.

FLASH — Adobe Flash is a set of multimedia software created by Macromedia and currently developed and distributed by Adobe Systems. A popular method for adding animation and interactivity to webpages; Flash is commonly used to create animation, advertisements, and various webpage components, to integrate video into webpages, and more recently, to develop rich Internet applications. It is available in most common web browsers and some mobile phones and other electronic devices. Several software products, systems, and devices are able to create or display Flash, including the Adobe Flash Player. One of the advantages of Flash animations is that they are primarily vector-based, thus their relatively fast download time.

FOUR-COLOR PROCESS PRINTING — A printing technique using the four process colors (cyan, magenta, yellow and black) to simulate a variety of colors as well as full-color images. Also called process printing or four-color printing.

FOLIO — A page number.

FPO — Abbreviation for For Placement, Position or Presentation Only. An image marked as such is not to be printed.

FTP — File Transfer Protocol (FTP) is a network protocol used to transfer data from one computer to another through a network, such as the Internet. A FTP client may connect to a FTP server to manipulate files on that server. As there are many FTP client and server programs available for different operating systems, FTP is a popular choice for exchanging files independent of the operating systems involved.

GIF — Short for Graphics Interchange Format. GIF images are the most widely used graphic format on the web. The format uses a palette of up to 256 distinct colors from the RGB color space. It also supports animations and allows a separate palette of 256 colors for each frame. The color limitation makes the GIF format unsuitable for reproducing color photographs and other images with continuous color,

but it is well-suited for more simple images such as graphics or logos with solid areas of color. GIFs are capable of supporting a transparent background.

GRAYSCALE — Grayscale images contain black, white, no color and up to 256 shades of gray. Grayscale is the normal method of sending an image to print for black and white images. Photoshop and other digital image editors are able to save files as grayscale, or to convert RGB or CMYK files into grayscale for black and white reproduction.

HALFTONE — Halftone is the technique that simulates continuous tone imagery through the use of equally spaced dots of varying size. Halftone can also be used to refer specifically to an image that is produced by this process. Where continuous tone imagery (film photography, for example) contains an infinite range of colors or greys, the halftone process reduces visual reproductions to an image that is printed with only one color of ink. This binary reproduction relies on a basic optical illusion—that these tiny halftone dots are blended into smooth tones by the human eye.

HICKEY — Small specks or spots in printing that are caused by dirt and dust that has collected onto the plates or blankets. They typically appear as white shapes in large areas of solid color.

HEXADECIMAL CODE — A six-digit, three-byte alphanumeric code used in HTML, CSS and other computing applications to represent colors. The bytes represent, in order, the red, green and blue components of the color. One byte represents a number in the range 00 to FF (in hexadecimal notation), or 0 to 255 in decimal notation. Hexadecimal color codes are always preceded by a "#" sign. Example: #0099CC.

HTML — Abbreviation for Hypertext Markup Language; a cross-platform text-formatting system for creating webpages, including copy, images, sounds, frames, animation and more. It is the predominant markup language for webpages, and provides a means to describe the structure of text-based information in a document. It does so by denoting certain text as links, headings, paragraphs, lists, and so on, and by supplementing that text with interactive forms, embedded images, and other objects.

JAVA — A programming language originally developed by Sun Microsystems and released in 1995 as a core component of Sun Microsystems' Java platform. It is used primarily in web applications and has many advantageous characteristics, such as its platform independence, allowing it to run on any computer, regardless of operating system.

JPG (or JPEG) — Abbreviation for Joint Photographic Experts Group. JPG is the most common image format

used by digital cameras and other photographic image capture devices, and is also the most common format for storing and transmitting photographic images on the web. They use a lossy compression system, meaning they can be tweaked to a desirable trade-off between image size and quality. JPG images allow for more colors than GIF images and are usually larger in size. They do not support transparent backgrounds.

KERNING — The horizontal spacing between the letters in a word.

LANDSCAPE — An image or design in which the width is greater than the height. The opposite of Portrait.

LEADING — The vertical spacing between lines of text.

LETTERPRESS — Method of printing from raised surfaces, either metal type or plates whose surfaces have been etched away from image areas. Also called block printing.

LIGATURE — In writing and typography, a ligature occurs where two or more letterforms are joined as a single character. Ligatures usually replace consecutive characters sharing common components. The most common example is perhaps the lowercase 'f' and 'i,' forming the glyph 'fi.'

LITHOGRAPHY — The most common method of plate printing; where an inked impression is transferred from a plate to a blanket and then to paper. Also called offset printing or offset lithography.

LIVE AREA — The "safe area" on a press sheet inside of which any text or images not intended to be cut away should be placed.

LOSSY — A lossy compression method is one where compressing data and then decompressing it retrieves data that has degraded in quality, but is close enough to be useful in some way. Lossy compression is most commonly used to compress multimedia data (audio, video, pictures), especially in applications such as streaming media and web graphics. By contrast, lossless compression does not degrade in quality when compressed and then decompressed.

METALLIC INK — Ink containing powdered metal or pigments that simulate metal.

MOIRÉ PATTERN — An undesired pattern of visual interference in raster images caused by incorrect placement of halftone screens. Some kind of moiré pattern is inevitable, but in favorable circumstances the pattern is "tight;" that is, the spatial frequency of the moiré is so high that it is not noticeable. In the graphic arts, the term moiré means an excessively visible moiré pattern. Part of the prepress art consists

of selecting screen angles and halftone frequencies which minimize moiré. The visibility of moiré is not entirely predictable. The same set of screens may produce good results with some images, but visible moiré with others.

MOV — File extension for the QuickTime multimedia file format. Most often a movie or video clip.

OFFSET PRINTING — See lithography.

OPENTYPE FONTS — OpenType, a joint effort from Adobe and Microsoft, is the latest font format to be introduced. Like TrueType, OpenType fonts contain both the screen and printer font data in a single component. However, the OpenType format has several exclusive capabilities including support for multiple platforms and expanded character sets. OpenType fonts can be used on either Macintosh or Windows operating systems.

PANTONE MATCHING SYSTEM — The Pantone Matching System, often abbreviated PMS, is the industry standard color matching system used for defining and blending spot colors. Assigning each color in its system a numeric value, it accommodates designers and printers with swatches of over 700 colors and gives printers the formulas for making those colors. This assures the faithful reproduction and matching of specified colors, so long as the same Pantone inks are used, and regardless of printer.

PERFECT BIND — A method for binding books or brochures using sheets that have been ground at the spine and are held to the cover by glue. Also called adhesive bind, cut-back bind, glue bind, paper bind, patent bind, perfecting bind, soft bind and soft cover.

PDF — Short for Portable Document Format, PDF is the Postscript file format used by Adobe Acrobat. It is a proprietary format for the transfer of designs across multiple computer platforms and users. PDF is a universal electronic file format, modeled after the PostScript language and is device-and resolution independent. Documents in the PDF format can be viewed, navigated, and printed from any computer regardless of the fonts or software programs used to create the original.

PICA — A unit of typographic measurement equivalent to 1/6 of an inch. There are 12 points in a pica, and 6 picas in an inch.

SELF COVER — A printed piece where the cover stock is a heavier weight than the text stock.

PNG — Portable Network Graphics format. PNGs are another type of image file used on the web, with the benefit that they use lossless compression. The PNG format displays images without jagged edges while

keeping file sizes relatively small. PNG files are, however, generally larger than GIF files.

POINT — The smallest unit of typographic measurement. The Point system is the most common form of measurement for setting type. Font sizes and line spaces (leading) are nearly always specified in points. There are 72 points in an inch.

PORTRAIT — An image or design in which the height is greater than the width. The opposite of Landscape.

POST-SCRIPT FONTS — The PostScript font format was developed by Adobe in the 1980s, several years before the release of TrueType. PostScript has long been viewed as a reliable choice, particularly for professional designers, publishers and printers. PostScript fonts consist of two parts, a screen font and a printer font, both necessary for the font to be properly printed and displayed on screen. With most operating systems, PostScript fonts can be installed simply by being placed in the system's font folder. However, PC users working on operating systems that predate Windows 2000 need to install special software in order to use PostScript fonts.

PRESS CHECK — Examination and adjustments of the press sheets at the printer before authorizing full print production to begin.

PROOF — Any color proof made using ink jet, toner, dyes or overlays. Prepared for review to reveal errors or flaws, predict results on press, and record how a printing job is intended to appear when finished.

PSD — Short for Photoshop Document. The default file extension of the proprietary file format of Adobe Photoshop. The format stores an image with support for most imaging options available in Photoshop. These include layers, color spaces, transparency, text, spot colors, and clipping paths. This is in contrast to many other file formats (e.g. EPS or GIF) that restrict content to provide streamlined, predictable functionality. Photoshop's popularity means that the PSD format is widely used, and it is supported to some extent by most competing software.

RASTER GRAPHICS — Raster graphics, also known as bitmap graphics, are images stored as an arrangement of pixels within specified dimensions. They are defined by specifying the colors of the individual pixels which make up the picture. In direct contrast to vector graphics, raster images will lose quality if they are enlarged and gain quality if they are reduced in size. As such, they are resolution dependent. Web graphics and digital photographs are examples of raster images. Common types of raster graphics are GIF, JPEG, Photoshop, TIFF, and PNG files.

RESOLUTION — Generally, resolution refers to the sharpness of an image on film, paper, computer screen, disc, tape or other medium. It describes the level of visual detail an image holds. The resolution of an image is an important factor in determining the attainable output quality. The higher the resolution of an image, the less pixilated it will be and the curves of the image will appear smoother. For the most part, standard print resolution is 300 dpi, while standard web resolution is 72 dpi.

RGB — An abbreviation for Red, Green and Blue. By combining these three colors using the additive properties of light, a large percentage of the visible color spectrum can be represented. RGB is the model used to project color on a computer monitor, and is therefore the color space used in web design. In contrast, print designers typically define colors using CMYK.

ROYALTY-FREE — Intellectual property like photos and graphic images that are sold for a single standard fee. These can be used repeatedly by the purchaser only, but the company that sold the images usually still owns all the rights to it.

SADDLE STITCH — To bind by stapling sheets together where they fold at the spine. Also called pamphlet stitch and stitch bind.

SANS SERIF — Meaning “without feet,” a typeface that lacks the serif stroke at the end of the horizontal or vertical strokes of the main letterform. Common examples include Arial, Helvetica and Verdana.

SCORE — Creasing a sheet of paper so that it will fold easily, without cracking the paper or ink.

SELF COVER — A printed piece where the cover stock is the same weight as the text stock. This type of cover is generally used on booklets and smaller publications.

SERIF — A serif font is a typeface that has an extra stroke at the end of the vertical and horizontal strokes of the main letterform. It was once believed that serif fonts were more readable than sans-serif for large blocks of printed body copy. This theory has since been disproven. Examples of serif typefaces include Times, Garamond, Goudy and Palatino.

SIGNATURE — A large sheet of paper printed with several pages, which, when folded, is intended to form four or more leaves in the finished book

SPOT COLOR — Refers to a method of specifying and printing colors in which each color is printed with its own ink. In contrast, process color printing uses four inks (cyan, magenta, yellow and black) to produce all other colors. Spot color printing is effective when the printed matter contains only one to three different

colors, but it becomes expensive for more colors. Converting a spot color to a four-color process mix is possible, but typically results in a slight (sometimes severe) shift in hue.

SWF — An abbreviation for Shockwave Flash. A partially open file format for multimedia and especially vector graphics. Intended to be small enough for publication on the web, SWF files can contain animations or applets of varying degrees of interactivity and function. SWF is also sometimes used for creating animated display graphics and menus for DVD movies, and television commercials.

TIFF — An abbreviation for Tagged Image File Format. A common graphic file format used for saving bitmapped images such as scans, photographs, illustrations and logos. Unlike standard JPEG files, TIFF files store their data using lossless compression, allowing them to be edited and re-saved without losing image quality.

TRIM AREA — The actual image area on a press sheet within the crop marks. This will be the final, finished size of the piece.

TRUETYPE FONTS — A font technology developed by Apple Computers and adopted by Microsoft. Like PostScript, TrueType fonts are scalable to any size without a loss of quality. Unlike PostScript fonts, however, they contain all their information—bitmap and vector—within one digital file.

UNCOATED PAPER — Paper that has not been coated. Also called offset paper.

URL — Abbreviation for Uniform Resource Locator. An address referring to a document on the Internet. In other words, it is the address of an individual webpage element or web document on the Internet. For example, the URL for a home page is commonly written as: <http://www.companyname.com/index.html>.

UV COATING — A liquid coating applied to a printed piece, which is then bonded and cured with ultraviolet light. This coating is used to provide a protective coating to the printed image.

VARIABLE DATA PRINTING — Variable-data printing (VDP) is a form of printing in which elements such as text, graphics and images may be changed from one printed piece to the next, without stopping or slowing down the printing process and using information from a database or external file. For example, a set of personalized letters, each with the same basic layout, can be printed with a different name and address on each letter. VDP enables the mass customization of documents via digital print technology, as opposed to the ‘mass-production’ of a single document using offset lithography.

VARNISH — Liquid lacquer applied to a sheet of paper as a coating for protection and appearance. Varnish can be applied to a specific area of a sheet (a spot varnish), or can be made to cover an entire sheet (flood varnish).

VECTOR GRAPHICS — In contrast to raster images, which are defined by specific pixel dimensions, vector graphics are drawn in points, lines, curves, and shapes, which are all based upon mathematical equations. This allows them to be resized and altered freely without any degradation in image quality.

WATERMARK — A watermark is a recognizable image or pattern in paper that appears lighter when viewed by transmitted light or darker when viewed by reflected light atop a dark background. A watermark is very useful in the examination of paper because it can be used for dating, identifying sizes, mill trademarks and locations, and the quality of a paper. Watermarks vary greatly in their visibility.

WEB-SAFE COLORS — This set of 216 color values, most often used in HTML code, was developed at a time when many computer displays were only capable of displaying 256 colors. It was selected because it allows exactly six shades each of red, green, and blue ($6 \times 6 \times 6 = 216$). Due to the fact that most present-day users have monitors that support millions and millions of colors, the use of web-safe colors has fallen into practical disuse. Web-safe colors are most often expressed in hexadecimal triplets, such as #00FF88, or RGB triplets such as 175 238 238.

WORK AND BACK — A printing method where different pages are assembled so that they are on one plate. One side is printed and the sheet is turned from front to rear so that you are using the opposite edge. The second side is then printed and the product is cut apart to make two finished items.

WORK AND TURN — In printing, work and turn means to print one side of the paper, then turn it over from left to right and print the second side with the same plate.

WMV — An abbreviation for Windows Media Video. A compressed proprietary video file format developed by Microsoft. Macintosh computers cannot view WMV files without additional third-party software.

X-HEIGHT — In typographical terminology, the x-height of a font is the distance between the baseline of a line of type and the top of the main part of the lower-case letter-faces, apart from the ascenders and descenders. It is so called because the height of the lowercase letter ‘x’ is used as the prime example.

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