



Printing on the Desktop

Digital imaging provides photographers with tremendous control over their images. In effect, it enables them to do everything they could do in the traditional wet darkroom—and then some—without the challenges and limitations inherent in that process. The cornerstone of the digital darkroom for serious photographers is the print-making process. This process involves making decisions about the printer and media, preparing the images, and producing accurate output. It also opens the door to new possibilities and flexibility in output.

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Choosing the Printer and Medium

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For the vast majority of serious photographers, the final print defines the photograph. We put a tremendous amount of time, money, and effort into capturing and optimizing images, and most of these images are shared and enjoyed in the form of a print. Choosing the right printer and print medium for a particular image is a key step in producing a print you'll be proud of.

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Choosing a Printer

When photographers think of output, the first thing that comes to mind is a print. The defining moment for photographers working in the digital darkroom is when the ink meets paper. To get the best results, make sure you use a printer that includes features that will make your workflow efficient and will produce the quality you demand.

Fortunately, there is no shortage of excellent printers capable of producing exceptional photo-quality output. Most photographers will want to use a photo inkjet printer because of the excellent quality and flexibility offered. Dye-sublimation printers have some advantages, such as durability and a highly “photographic” appearance. However, we don’t consider them to be the best solution for most photographers because they tend to be more expensive and don’t support a wide range of print media (papers). You should consider using a photo inkjet printer to produce prints of your images (see Figure 1.1). With a good inkjet printer, you can exercise greater control over the print-making process and save money. Generating your own prints is less expensive than using a high-quality print lab to produce them.



Figure 1.1 A photo inkjet printer, such as this Epson Stylus Photo 2200, allows you to produce prints of exceptional quality at a reasonable cost per print.

When choosing a photo inkjet printer there are quite a few issues to consider: the size of the output, the type of ink used, the number of inks, the size of the droplets of ink, the resolution of your output, the media supported by the printer, and the capabilities of your software. We cover each of these items in turn.

Output Size

Most photo inkjet printers fall into two categories of maximum output size: 8.5"×11" and 13"×19". There are also other printers that offer larger output options, including wide-format printers with widths up to 44". When deciding on the right printer for you, consider how large you'll likely need to be able to print both now and in the future.

Ink Types

The basic choice here is between dye-based inks and pigment-based inks. Pigment-based inks last longer, but they have a narrower color gamut than dye-based inks. Still, the latest pigment-based inks, such as the UltraChrome inkset from Epson, provide vibrant colors that come close to matching dye-based inks. We recommend using pigment-based inks if you are producing prints for sale or for long-term display. If you don't need your images to last terribly long, and color vibrancy is more important, then dye-based inks might be an excellent choice. However, with the cost of pigment-based printers coming down nearly to the level of current dye-based printers, the choice to favor longevity in prints is even easier.

Note: Just because pigment-based inks last longer than dye-based inks doesn't mean that dye-based inks will necessarily fade quickly. Many dye-based inks, when used in conjunction with appropriate papers, are able to produce prints that will last many decades. For details on print longevity estimates for a variety of printers, visit the Wilhelm Imaging Research website at www.wilhelm-research.com.



Number of Inks

Inkjet printers produce various tonal values for each color by adjusting how large the droplets are (if possible) and by adjusting the spacing between the droplets. The smaller and further apart the droplets are, the lighter the color will appear (see Figure 1.2).

To maintain the finest detail, many printers utilize "light" ink colors in addition to the standard cyan, magenta, yellow, and black (CMYK) inks so the droplets don't need to be spaced as far apart as would otherwise be necessary. These diluted inks (usually light cyan and light magenta, with some printers using a light black as well) provide for higher quality in the final print, while maintaining the ability to produce a

wide range of color and tonal values. As a general rule, printers with six or more ink colors will produce the best results because the lighter inks provide broader tonal range while maintaining the ability to produce fine detail.



Note: Epson has a new UltraChrome Hi-Gloss inkset that uses red and blue inks instead of light cyan and light magenta. Because the ink droplets are so small, the diluted inks are no longer necessary to produce excellent quality. The red and blue inks help to expand the color gamut of the printer by offering additional hues that would otherwise be difficult to produce. Unfortunately, these new inks are not compatible with previous printers that use the original UltraChrome inks, and they are optimized specifically for glossy papers.

Ink Droplet Size

The smaller the ink droplets, the wider the range of tonal values and the finer the detail is that the printer is able to produce (see Figure 1.3).

Anything below 6 picoliters is very good, with 2 picoliters currently the smallest droplet size available.

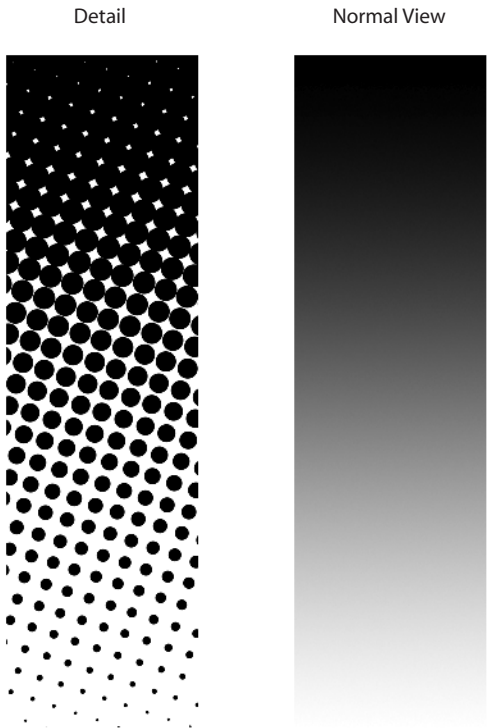


Figure 1.2 Inkjet printers simulate various tonal values by varying the size and spacing of individual ink droplets.

Resolution

For all practical purposes, you can pretty much ignore this specification. That's because any recent model photo inkjet printer will be able to produce output at 1,440 dpi or higher. In fact, even if your printer offers a higher quality setting, we recommend using the 1,440 dpi setting, which will still provide excellent quality indistinguishable from the higher settings. It will also print faster and use less ink. Keep in mind that this resolution specification is not the same as "image resolution." The printer resolution should be thought of only as an output quality setting.

Media Support

The variety of print media to which a printer is able to print to successfully isn't usually included in the specifications provided by the manufacturer. With some ink formulations, the types of paper you can print to with good results can be limited. We recommend checking reviews in magazines or on the Web to determine the range of papers and other print media supported by the printer.

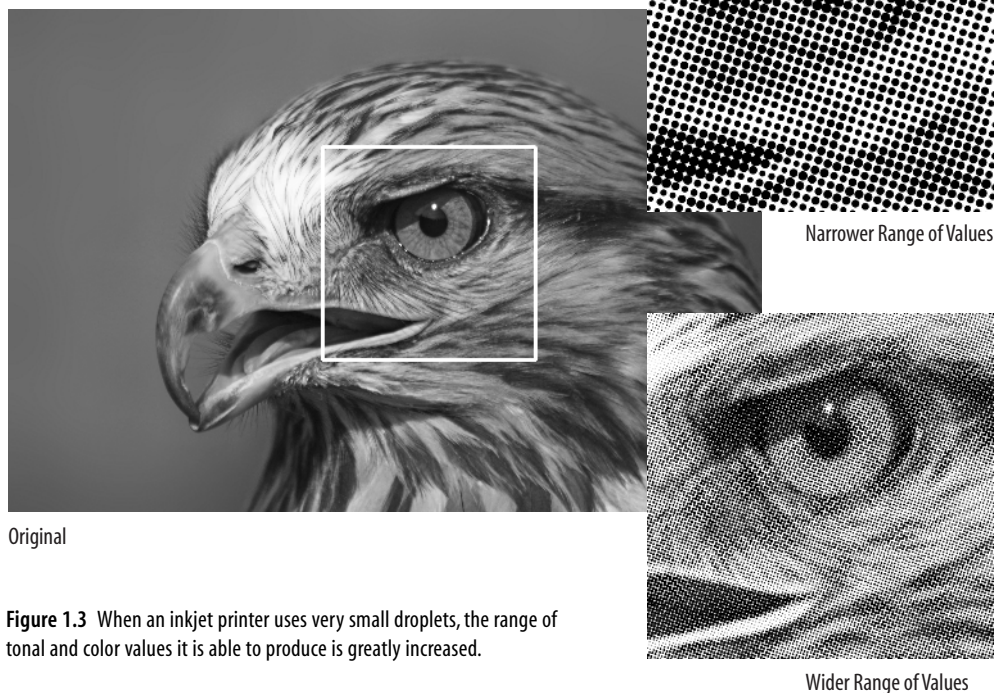


Figure 1.3 When an inkjet printer uses very small droplets, the range of tonal and color values it is able to produce is greatly increased.

The Truth About *dpi*

Resolution tends to be one of the most confusing topics for those who are new to digital imaging, and a tremendous amount of misinformation doesn't make it any easier to get a handle on it. Resolution relates to the quantity or density of pixels within an image. When you're talking about a digital camera, quantity is the normal unit of measure, such as megapixels. With a digital image file we refer to the number of pixels per inch (ppi), which is a measure of how the pixels within the image will be distributed. With a printed image, the density of the dots on paper is what matters. The more dots within an inch on paper, the more detail can be rendered and, therefore, the higher the quality. In this case, the number of dots per inch doesn't relate directly to image resolution, because more than one droplet of ink is used to create each pixel (dot) in the image file.

However, when it comes to ink on paper, there is a definite limit. In our experience, printers offering resolutions over about 1,440 dpi don't offer a real advantage. If your printer supports more than 1,440 dpi, it probably doesn't make any sense to use that higher setting, because you'll waste ink, require more time to produce a print, and the quality won't visibly improve.

When resizing the image, you need to specify an output resolution that is completely independent of the printer resolution. There are many theories regarding which image resolution is the best. Some say 240 dpi; others say 300, 360, or some other "magic number." We've done extensive testing, and we feel that any value between 240 and 360 dpi will produce excellent results. A setting of 360 dpi will generally ensure the very best quality, but this is a quality difference that is virtually impossible to distinguish from an image set to 240 dpi for printing. Therefore, as far as we're concerned you can use any value between 240 and 360 dpi. To us, 300 dpi makes sense because it still ensures excellent print quality while also matching the standard used by most offset press printers in the industry.

Software Capabilities

Getting information from manufacturers about the flexibility and ease-of-use of the dialog boxes you will use to configure their printer settings is difficult. Again, refer to reviews in magazines or on the Web for information on whether the printer settings allow you to adjust the output to get the most accurate colors and to see how easy a particular printer is to operate.

Specialty Inksets

The vast majority of photographers use the inks that were specifically designed for their printers. However, if you're willing to deal with the limitations and possible complications of using third-party inks, the results are often well worth the trouble, particularly when your goal is to produce perfectly neutral black-and-white prints.

Staying with the manufacturer's printer-specific inks is certainly the safest approach, as printer manufacturers develop inks for the printers that will produce optimal results and ensure compatibility. Using third-party inks does introduce concerns about clogging, and it voids the printer manufacturer's warranty. However, most of them are engineered to work well with a wide variety of inkjet printers. Although most specialty inks work with a relatively large number of printers, the list isn't exhaustive. You'll need to confirm that your printer is compatible with the inksets you plan to use. Many of the more recent printer models utilize special chipsets for their ink cartridges that make it difficult or impossible to use third-party inks with those printers. Check compatibility before you plan to use third-party inks.

Note: Specialty inksets are available from a wide range of sources. Some of the most popular inksets include Lysonic from Lyson (www.lyson.com), Piezography from Cone Editions (www.piezography.com), Generations pigmented inks from Media Street (www.mediastreet.com), and a variety of inksets from MIS Associates (www.inksupply.com).



The most common type of specialty inksets are those known as “quadtone” inks. This name comes from the fact that these inks originally included four shades of black (tones) to replace the four colors of early printers. New printers have six or seven ink colors, and some of the newer specialty inksets include more than four inks.

Note: Although most quadtone inks now include more than four shades of ink, the name has stuck.



Inkjet printers with standard inks create grayscale images by using only the black ink or by blending all of the ink colors. Using only the black ink means the printer won't be able to produce the wide range of tonal values we expect in an image, and the resulting print will lack smooth gradations of color. Blending all of the color inks ensures smooth gradations of tone; however, if the inks are not mixed in perfect balance, the result can be a grayscale print with a very strong color cast. In our experience, most printers are simply not capable of producing a perfectly neutral grayscale print.

Because quadtone inks have multiple inks of varying tonal values, they are able to solve both problems at once. Multiple shades in the inkset ensure smooth gradations of tonal values within the print, and the fact that all of the inks are perfectly neutral ensures the print won't exhibit any color cast.

Of course, there are situations where you want to produce a grayscale print that isn't perfectly neutral. This option is also available from most of the quadtone ink

suppliers. The inks are offered in both warm and cool versions that provide a consistent print with a slight cast that adds an element of depth to the image. Inksets are also available to produce a realistic sepia-tone print on your inkjet printer, using a stronger color cast than the warm or cool quadtone inks.



Note: When using specialty inksets, you will generally need to flush the printer when changing inksets and periodically after certain usage intervals. To ensure optimal performance with your printer, be sure to carefully read and follow the instructions for using specialty inksets.

Pigmented ink is another type of specialty ink that provides archival capabilities for printers that are designed to work only with dye-based inks. A popular example is the Generations series of inks from Media Street (www.mediastreet.com). Some versions are designed to allow dye-based printers to use pigmented inks. Other versions replace the pigmented inks of certain printers with less expensive pigmented inks.



Note: Because of the challenges involved with switching between ink types on any inkjet printer, we strongly recommend that you purchase an additional printer to use exclusively with specialty inks if you are going to use them.

Setting the Mood

When you view a photographic image on display in an art gallery, the elements surrounding the image are often carefully planned. The walls are generally plain and neutral so that your attention is not drawn away from the image. The image itself is adorned in a frame that both complements the image and draws you into the photograph. The lighting isn't typically a harsh spotlight; it is usually a warm illumination source that glows as an aura around the image.

The photographic image itself stands at the center of this shrine, at the focus of attention. All the other elements such as mat, frame, and lighting are added to emphasize the photograph, not to draw your attention away from it. To be presented in such a manner, the image must be printed on some form of print medium.

Just as a painter can choose a canvas type for the specific image to be created, photographers have many options when it comes to the media on which an image is printed and displayed. The paper you use to print an image can make an amazing difference in the final presentation. Each paper has different properties of ink absorption, different color, and different texture. While this provides variety that appeals to many

photographers, it is important to remember that the print medium sets the mood for the image. Therefore, rather than simply choosing a material that you like, the print medium should be matched to the image to complement it.

Glossy or Matte?

As you decide which paper types are best suited for a particular image, the first issue to consider is the surface type, which is generally categorized as glossy or matte finish. This is an obvious simplification of the wide range of possibilities, but these two basic categories provide some direction to begin the decision-making process.

With glossy papers, the inks tend to sit up on the surface of the paper rather than soaking into it. The result is that colors are more vibrant, the contrast is higher, and the final print contains more detail. Glossy papers are, therefore, appropriate when you want to emphasize those properties in an image.

Matte papers absorb the inks more, so that they don't stay at the surface (see Figure 1.4). Also, matte papers tend to cause more *dot gain*, which is the amount the inks spread once they come in contact with the paper (see Figure 1.5). Because matte papers are more absorbent, the inks are able to spread more easily. As a result, the colors are more muted, the contrast is lower, and some detail is lost. These characteristics can complement subtle or ethereal images and enhance images for which you are trying to achieve a more “painterly” appearance.

These general rules offer some guidance in determining the general type of paper that is most appropriate for a particular image. However, the distinction between the different types isn't quite so clear. Many new matte-surface papers now include special coatings to optimize them for inkjet printing. These coatings reduce dot gain and keep the inks on the surface, resulting in a matte surface without reflections that retains vibrant colors, high contrast, and excellent detail in the printed image.



Figure 1.4 Inks tend to sit on the surface of glossy papers. They are absorbed into matte papers, resulting in different tonal and color properties between the same colors printed to different paper types.



Figure 1.5 Matte papers, especially when they aren't coated, introduce much more dot gain than glossy paper types.

Media Options

If categorizing your basic print media options as either glossy or matte is a bit simplistic, the actual range of available options is mind-boggling. Each printer manufacturer offers a respectable selection of papers, and third parties offer a virtually unlimited variety.

We encourage you to experiment with different media types. While an image may seem perfectly suited to a particular paper, exploring other options is a good idea. You may be surprised to see how images look on different materials.

There's no such thing as the perfect medium for a given photographic image. Instead, each type of media allows you to present a particular interpretation of the image. It isn't a matter of deciding which media is the right one for a particular image, but rather which medium creates the intended interpretation for an image. When you match the right medium with the right image, the result is a print you'll be proud of (see Figure 1.6).



Figure 1.6 The wide variety of media options for photo inkjet printers gives you incredible flexibility for your images. (Photograph by Jeff Greene, ImageWest Photography.)

Note: Selecting the right media for your images is very subjective. We each have our own tastes and preferences. There is no “right answer” when it comes to choosing the right media for your images. Evaluate a wide range of options, and decide which achieves the look you prefer.



Traditional Papers

Many digital photographers started with film photography, and so they tend to think of the traditional papers when it comes time to make a print in their digital darkroom. The traditional papers are the basic options that you can find at any retailer that stocks photo inkjet supplies. These include the glossy, semi-gloss, and matte papers, all with a relatively smooth surface. Each of these categories of papers is best suited to a specific type of image:

- **Glossy** papers are best for images that require maximum impact. Because these papers maintain vibrant colors and high contrast, they are ideally suited for images with highly saturated colors. (However, the glare associated with the gloss may actually make it more difficult to see the detail within an image, depending on the lighting conditions where it will be viewed.)
- **Matte** papers work best with images with soft, muted colors, or where you don't want to emphasize detail. If the image contains muted colors to begin with or you want to tone down the colors in the image for effect, a matte paper is a good choice.
- **Semi-gloss** papers are a compromise between glossy and matte papers. They are well-suited for images that fall somewhere between the vibrant images that work best on glossy papers and the muted images that work best on matte papers. Semi-gloss is often the choice of photographers who would normally opt for a glossy paper, but who want to avoid the distracting glare and reflections that tend to occur with glossy papers.

Sampler Packs

Many paper manufacturers offer sampler packs at a nominal price. These sampler packs include a sheet or two of a variety of papers. Using these samples is an excellent way for you to test different papers and find the ones you like the most. Companies offering such sampler packs include paper manufacturers Red River Paper (www.redrivercatalog.com) and Legion Paper (www.legionpaper.com), and paper distributor Digital Art Supplies (www.digitalartsupplies.com).

These sampler packs offer excellent value, and they are frequently priced very competitively, in the hope you'll become a regular customer of the papers included in these packs. They are a low-risk and inexpensive way to try a wide variety of papers to see which you like the best.

Third-Party Papers

Some paper and ink combinations can produce very unsatisfactory results. Using papers produced by one printer manufacturer on a printer from a different manufacturer can cause compatibility problems. Some combinations do work, but be aware that compatibility problems do exist.

Many third-party papers from companies that don't manufacture printers have been specifically designed to work well with a wide range of printers, making them safe to use on virtually any printer. Printer manufacturers often recommend that you only use their brand of papers with their printers, but many third-party papers work exceptionally well with virtually all printers.

Be sure to check the website of third-party paper manufacturers for custom profiles for any third-party papers you plan to use. For one thing, those profiles will often ensure the most accurate prints possible. If profiles for a given paper are available for your model of printer, that is a good indication that the manufacturer has tested the paper for compatibility with that printer.

When you use third-party papers, the longevity of those prints may be an unknown because these combinations are not typically tested. In general, when using third-party papers you can expect the longevity to meet at least the level of the lowest-rated print medium from the same manufacturer as the printer, although that isn't guaranteed.

Fine Art Papers

Traditional print media are fine when you are simply sharing your images, such as with snapshot photos. Although many of the traditional print media provide beautiful ways to present your images, there are many other options that allow you to showcase your images in style.

You'll find that most of the papers considered worthy of the label "fine art" have a matte surface. Fine art images don't need to be flashy. In fact, any gloss on the surface can tend to detract from the image. The image should be able to stand on its own without the need for a glossy surface to add impact. Many of the current fine art papers are coated so that they don't behave the same way uncoated matte papers do. The coating keeps the inks near the surface of the paper and reduces dot gain, so colors remain vibrant and detail remains crisp.



Note: Keep in mind that even papers with a matte surface will tend to look slightly glossy when displayed under glass. We think of glass as a "surface equalizer" because most papers, when viewed through glass in a frame, tend to look somewhat glossy.

Many of the fine art papers also have a creamy color ranging from off-white to nearly beige. Although we tend to think of bright white paper as being the most desirable, the warm tone of many fine art papers adds richness to the printed image. When you first handle a fine art paper, you'll find that it feels substantial in your hands. These materials tend to be relatively heavy and thick. Of course, an image printed on fine art material will most likely end up matted and framed, so nobody will know how thick the medium is. Still, the heavier grade of these materials adds to their perceived value. While you may be the only one to hold a print before it gets matted and framed, you'll appreciate the durability and heft of the medium.

Of course, the increased weight and thickness of these fine art materials can be a problem. Many inkjet printers have a difficult time feeding these papers. In some cases, you can get the paper to feed through repeated attempts, but this can be frustrating. If your printer doesn't offer a special slot for feeding thicker papers, try to feed the paper into the printer before starting the print job by placing the paper in the input tray and pressing the paper feed button. Doing so will ensure the paper is properly loaded and ready for printing before the printer actually attempts to put ink onto the paper.

Note: Just because a printer is able to feed thick paper doesn't mean it will print reliably to it. Check the manual for your printer to determine the thickness limitations. Printing on thicker materials than your printer is designed for can result in damage to the prints *or your printer*.



There is considerable variation in surface texture for the many fine art papers available. Some, such as Epson's UltraSmooth Fine Art paper, are designed to be as smooth as possible with absolutely no texture. Others include a texture that adds depth to the printed image. Examples include Epson Textured Fine Art paper, Hahnemühle Torchon, Epson Canvas, and Lyson Rough Fine Art paper.

The various features of a fine art paper create an elegant material that feels good in the hands, displays well, is sturdy and rugged, protects the inks to stand the test of time, and maintains the vibrancy and accuracy of the colors in your images.

Fine Art Favorites

Many options are available to you when you are looking for a fine art paper to showcase your best images. Some of our favorites include the following:

- **Somerset Velvet** is a radiant white paper with a surface that is slightly textured. It is one of the most popular papers for fine art photo inkjet printing.
- **Hahnemühle Photo Rag** is a bright white cotton rag medium with a smooth surface. It maintains vibrant colors and a high dynamic range in the prints.

- **Hahnemühle Torchon** is a unique paper with a beautiful texture that resembles fluffy clouds. It maintains vibrant colors, but the texture is the real advantage. It works best with images that have areas of smooth texture that allow the paper's texture to really show through.
 - **Epson Canvas** is a true canvas material with a coated printing surface. It works very well with deep tones and rich colors, adding a painterly look to the printed image.
- Use this list as a basic guide to papers you may want to try, but research other options to find the materials you feel best accentuate your images.



Note: Matte papers in general will offer less vibrant colors than their glossy counterparts. However, many matte papers (particularly fine art papers) utilize special coatings that result in colors that are nearly as vibrant as glossy papers without the reflections and glare that many photographers prefer to avoid in their prints.

Epson Canvas

Many print media options are promoted as “canvas.” However, most of them are simply traditional papers with a faux canvas texture added to them for effect. These papers can be nice materials to print your images on, but they don’t tend to achieve a fine art appearance.

We’ve tested a wide variety of canvas materials for inkjet printing. By far, our favorite is the Epson Canvas material. Rather than a traditional media type with texture added after the fact, the Epson Canvas is a genuine canvas material that has been coated so it will accept the inks from inkjet printers.

Epson Canvas is only offered in large rolls for the Epson Stylus Pro line of printers. It is recommended only for these printers because the fabric back of the material causes problems for printers utilizing standard rollers to feed the paper, especially when the printer doesn’t support thick media. However, we’ve been successful in using the Epson Canvas in smaller desktop inkjet printers. Because the material only comes in large rolls, you’ll need to cut custom sheets of the paper and then feed the material into the printer before starting the print job. If your printer offers a manual feed slot (such as the Epson Stylus Photo 2200), utilize that option to feed the canvas material more reliably.

The Epson Canvas print medium is a gorgeous material with a beautiful texture. It can even be mounted on a stretch frame as would be done with a painting on canvas, adding to the fine art appeal of this material. We find the Epson Canvas most appropriate for images with deep tones and rich colors, and it works very well with images containing smooth textures that allow the texture of the canvas surface to show through.

Specialty Media

Most photographers print their images to be shared through traditional means such as matting and framing them. However, there are many other ways to share a printed image, and specialty media provide the options. When you want to add a bit of flair to an image, specialty media may be the best choice. These media offer unconventional surfaces or materials designed for a specific purpose. Whatever their novelty, they add considerable variety to the available options in print media.

There are actually two basic categories of specialty media: those that are designed for specific predefined uses and those that are designed to help you create a unique presentation of an image.

As an example of a predefined use, prescored greeting cards that you can print on an inkjet printer provide a nice way to create your own cards to send to family and friends or offer for sale. Double-sided media are coated on both sides so you can create calendars or portfolio books. Websites such as Photographer's Edge at www.photographersedge.com offer such materials.

Note: Besides simple double-sided media, some specialty media is specifically designed to assemble into bound portfolio books. For example, the Stone Editions products (www.stoneeditions.com) can be used to produce an elegant book to showcase your images.



Certain specialty media explore the limits of creativity. While many of the traditional and fine art materials are designed to appeal to a very wide audience, specialty media, as the name implies, are designed for maximum impact. By their nature, many photographers feel that these specialty media are too extravagant to be taken seriously. However, when matched with the right image, some of these unique materials can add to the appeal of the final print. For example, a variety of paper manufacturers offer magnetic papers. These sheets typically have a semi-gloss surface you print on, and a magnetic back that is protected with a film for printing. After printing to this media, you can peel the backing, cut out the picture, and post it on your refrigerator or other metallic surface. Other materials such as the Tyvek Brillion from Epson provide a durable material you can use to create outdoor displays. Pictorico makes a special printable silk media that could be used to sew an image into a pillow. You can even print to special iron-on transfer material and then use an iron to apply the image to a t-shirt or other fabric. If you can imagine a way you'd like to share your images, there's probably a specialty print media to make it possible.



Note: When you print on certain types of specialty media, your first reaction may be to dislike the media. However, it is important to remember that the more unique the material, the more likely you'll need to find just the right image for that media type. Keep in mind that some of these specialty media types require longer drying times, and the difference in appearance between wet and dry ink can be substantial.

In some cases, what makes a particular medium special isn't the surface you print on, but what's on the other side. An example of this is magnetic media. Often available in a semi-gloss finish, magnetic media can be printed to directly. When you've printed the image, you can cut it out and peel the backing material to reveal the magnetic back, ready to be stuck to any metal surface.



Note: Keep in mind that magnetic media have the potential to damage magnetic storage devices such as computer hard drives. Resist the temptation to put images printed to magnetic media on the case of your computer or other delicate electronic devices.

Regardless of how you want to share your printed images, a specialty medium is probably available to enable you to realize your vision. By exploring the range of available media options, you'll discover possibilities you may not have anticipated, inspiring you to create new interpretations for your photographic images.

Backlight

Photographers who have used slide film know the limitation of a printed image. When they examine the image through a loupe on a light table, the backlighting creates a luminous image that simply glows. A printed image simply can't produce this luminous appearance because it depends upon light reflected off the paper rather than light emitted through the image as is the case with a slide.

Even digital photographers who have never experienced a slide on a light table can appreciate the lack of luminosity in a print. Because a monitor produces an image by emitting light, it glows in much the same way that a slide on a light table does.

If you've ever experienced this frustration, you'll be amazed at the impact you can achieve by printing to backlight film material and displaying the image in a backlit display frame (see Figure 1.7; also see the version of this image in the color section). Instead of a print that depends upon reflected light for visibility, backlight film materials are designed to take advantage of emitted light to produce a luminous image that will attract attention.



Figure 1.7 Displaying an image printed on backlight film in a backlit frame adds tremendous impact to the final display.

Backlight film materials have a glossy front with a matte back. You print on the back of the image, producing a very flat image with inaccurate colors that are likely to make you wonder if you did something wrong. But when you turn the image around to view the glossy side with a light source behind it, you'll be impressed.

Note: Although backlight film media typically offers longevity in line with other media types, these prints are exposed to bright light for much longer durations than normal, causing them to fade faster than you might otherwise expect.



Backlight film is certainly a specialty media type. That means there aren't a huge variety of backlight materials. Most printer manufacturers don't offer them. Epson had backlight film available in several sizes for a period of time, but they have since discontinued it. Fortunately, you can still find backlight film from a variety of sources. It may be difficult to find at retail outlets, but a variety of web-based stores, such as Digital Art Supplies (www.digitalartsupplies.com), carry several backlight film materials.

Once you have a beautiful image printed on backlight film, you'll have to find a way to display it. We'll talk about framing in Chapter 13, "Finishing Your Prints." Backlight materials require special consideration for framing, because they require a source of light behind them. That means buying a custom frame for the size print you want to display. Most frame shops don't have the resources to build a backlit frame, so you'll need to purchase a special backlit frame for these images.

Note: For backlit frames that illuminate your images and allow you to change the image in the frame, take a look at the PhotoGlow products available at www.photoglow.com.



Shooting for the Medium

Once you've worked with a variety of different paper options, you can start to anticipate how an image will look on a particular type of paper and which materials are best suited for a given image. When you get to this point, you can start to anticipate the print medium you'll use for the final print while you're capturing the image.

For example, you may become more observant of textures in the scene as you are capturing an image, anticipating the print medium that will best accentuate or complement the textures. You may also consider which medium is the best match for the colors in your image, considering a semi-gloss or coated matte paper for images with vibrant colors, and uncoated matte papers for images with more subtle colors.

In short, thinking about the final print can influence how you photograph a scene. Rather than causing you to narrow your focus when photographing a particular subject, thinking about the range of available paper options will likely provide motivation to explore different ways to photograph a particular subject or scene.

Paper Properties

Selecting the print medium for an image based on surface type makes sense, because that surface is where the image will reside. However, in addition to the surface type, you'll want to consider other attributes of the paper when selecting print media. You'll also want to evaluate the properties of the paper itself, to ensure you're using the best print media possible for your images. The following properties should be considered when evaluating particular print media:

- **Thickness** is a direct measure of the actual thickness of the paper, and is most often measured in mils. One mil is equal to 1/1000th of an inch. Very thin papers are less than 5 mils thick, and they aren't what we consider photo-quality papers. Typical photo papers are around 10 mils thick, with very thick fine art papers topping out around 20 mils.
Remember that just because a paper is thick doesn't mean it has a higher weight. Some thick papers aren't very dense, resulting in a lower weight. Although they will feel thick, they won't necessarily feel substantial.
- **Weight** is a measure of how heavy a paper weighs for a particular volume. The most common measurement is pounds, based on the weight of one ream (500 sheets) of the paper. However, the weight is based on 500 sheets at a standard size for the media type, which leads to confusion when comparing different papers because different papers come in different standard sizes. A more reliable

unit of measure is grams per square meter (gsm) because it is based on paper weight for a fixed surface area. Lightweight photo papers are typically around 200 gsm, and heavy papers can range up to about 500 gsm.

Remember that just because a paper is relatively heavy doesn't mean it is thicker. Some heavy papers are simply very dense but still thin.

- **Brightness** is a measure of how close to pure white the print medium is. Brightness is expressed as a percentage of pure white based on reflectance. If brighteners are added to the paper, they can cause fluorescence, resulting in a brightness value greater than 100 percent. Although brightness gives you an idea of how white a particular medium type is, that doesn't necessarily translate into higher quality. For example, while many papers have brightness values of 95 percent or higher, some of the best fine art papers have brightness values in the low 80 percent range.

Although high brightness is usually desirable, many fine art materials actually have a creamy color to them. In fact, brighter papers can often have a cheaper look when compared to the richness of fine art media.

- **Base Material** indicates the type of material from which the print medium is made. Paper manufacturers don't usually indicate what base material is used for their papers, except in the case of fine art papers. The two major categories for base material are *fiber based*, in which some form of natural fiber is used as the base material, and *resin coated*, which includes a plastic coating on the surface. The base material does not affect the appearance of the printed image as much as the surface type does, so this choice is largely a matter of personal preference.