

## Digital Printing FAQ:

### What is the best paper for making digital prints?

Use paper identified for photographic inkjet printing that is at least 170gsm. Ultimately it depends on your personal style and the style of each picture. Every paper imparts its own "personality" to your print, making it a unique piece of art. Test different types of papers and keep a variety of different surfaces on hand.

### Can I use acid-free stationery or watercolor paper in my printer?

No. Inkjet papers are prepared and coated to manage the spread of an ink droplet. On regular paper, even high quality ones, the ink runs along the fibers causing feathering and blurring. Also, regular bond papers have no protective coatings.

### The ink from my inkjet printer is "puddling" on the surface of my print on RC paper. What happened?

RC inkjet papers are sensitive to the amount of ink and the size of the drops that are sprayed onto them by your printer.

Adjust the settings in your Printer Driver Properties to the finest quality setting, 1440 dpi or greater. RC papers are especially susceptible to "puddling" but will yield excellent results when proper settings are used. See your manufacturer's recommended printer settings for details.

### Why can't I use Photo-Quality RC inkjet papers with my pigment-based Epson Stylus Photo 2200 printer?

This printer yields exceptional photo-quality results with long archival stability when matched with certain papers. Pigment based inks will not properly absorb into RC based papers nor will the benefits of the 2200's archival stability be achieved. Use only papers matched for this type of printer. Dye-based printers such as the Epson Stylus Photo 1280 yield excellent photo quality results with a wider range of papers but with shorter archival stability.

**TIP:** *When printing an image from your digital camera using Adobe PhotoShop, increase the resolution of your image file to 300 pixels/inch and size it down to the size at which you wish to print. Under the Image Menu choose Image Size and make your adjustments in the Document Size window.*

# Freestyle™

## Photographic Supplies

## Digital Photography: Printers, Inks & Papers



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## Freestyle Advisor #3

## INTRODUCTION

Digital Printing can be a difficult and expensive process. There are many myths and misnomers regarding digital printing. This Freestyle Advisor will help you understand the basics of inkjet printers, papers and inks. It will also give practical knowledge to enable you to make informed choices about what tools and materials you should acquire to make the most of your Digital Photography printing experience.

There are many types of printers on the market, including color laser, inkjet and dye sublimation. All of them claim the ability to print photo-quality pictures. Inkjet printers have become the most popular choice for professional photographers and photo enthusiasts alike as they offer flexibility, quality and value.

There are also a multitude of inkjet papers to choose from and the variety of choices makes it that much more difficult to come to a value decision on which paper to purchase. From regular copy paper to fine-art watercolor paper you need to choose the paper that is right for you.

## PRINTERS

An inkjet printer uses minute dots of different colored inks to produce an image. Most use one of two technologies to achieve this. **Thermal** (bubble jet) uses heat and the slightly superior **Micropiezo** which uses vibrating electronic crystals. The smaller and closer together the droplets are, the better the detail. Thus, printer resolution is measured in **dots-per-inch** or **dpi**. 360dpi is good for text-only drafts, 720dpi is perfect for text documents and color illustrations like charts and graphs, and 1440dpi is considered the minimum resolution for quality 8"x10" photographic output. 2880dpi printers offer even better output possibilities.

Inkjet printers use the Cyan, Magenta, Yellow, Black colored ink (known collectively as "CMYK.") The average three-color printer combines cyan (C), magenta (M) and yellow (Y) inks to reproduce a fairly broad pallet of colors, but images from three-color printers tend to have weak shadow and highlight areas. A four-color printer adds black ink (K) to the mix which allows for true black renditions but the resulting images tend to be over saturated with blocked up shadows and pixelated highlights. Because of these limitations, three and four color inkjet printers are considered general-purpose machines, good for text and illustrations (charts & graphs) and minimally satisfactory for photographic-quality output.



EPSON Stylus Photo 1280  
Inkjet printer

**Glossy** varieties of this paper have a traditional, high polished finish that enhances the vibrancy of color and maintains details in highlight and shadow areas. The base material can vary greatly from warm, creamy color to bright white, and glossiness can range from near semi gloss to high gloss.

**Semi-gloss** varieties (including lustre, satin, pearl, semi gloss, etc.) have a soft, low-glare surface, often with a subtle pebbled texture. Flattering to faces of all types, it is a popular choice for color portrait and wedding photographers. **Matte** varieties have a versatile no-gloss surface that accepts both dye and pigment based inks well. Quality matte papers yield beautifully deep blacks while maintaining very good color and detail.

## About Cast Coated, RC and Nanoporous Photo Papers

These terms refer to types of coatings used on photo quality glossy and semigloss papers. **Cast or Clay coated** papers have a low-gloss surface created by being polished on rollers during production. Cast coated papers absorb ink more readily than RC papers but yield a slightly lower color vibrancy and, under heavy saturation, shadow detail can block up. **RC or Resin-Coated** papers have a resin coating that produces a high-gloss surface. This high reflectance bounces light back through the ink yielding slightly more vibrant colors. Under heavy ink saturation, RC papers can suffer from slow drying times and inks pooling on the surface. **"Nanoporous"** (a.k.a. "microporous or microceramic") papers feature a unique layer designed to transport ink off the immediate surface and protect it while it dries. These papers yield instant "dry-to-the-touch" results, have good ink droplet control and produce colorful images.

## FINE-ART INKJET PAPERS

These subtle to heavily textured papers are designed to give images an artful quality. Most feature a warm base and some have a woven or parchment pattern applied. Quality versions are acid-free and made from 100% cotton rag. Fine Art papers are known to yield deep, velvety blacks, balanced mid-tones and sharp detail which makes them ideal for black & white applications, landscapes and art photography. Well respected papers in the fine art family include Crane's Museo, Hahnemühle and Lumijet.

### Layers

Photo-quality inkjet papers have multiple layers that control for everything from dot size to curl, static and glossiness. These layers also protect ink from UV, moisture and other damaging contaminants. Newer papers have the "microporous" (a.k.a. "nanoporous") technology for added protection and "instant dry-to-the-touch" capability.

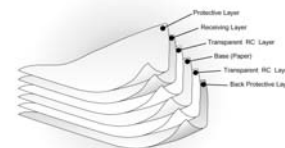


photo. Always buy a paper that is designed for **inkjet photography**, not simply for inkjet printers. As a general rule, avoid papers wrapped like copier paper in reams.

If possible, handle a sample of the paper. Is it thick and does it feel substantial? Hold it at the edge and shake it to hear its “snap.” The sound it makes should be clear and deep. Test the “tooth” by rubbing the surface with your fingers. Unless it is a Fine-Art type paper, it should be smooth to the touch. Visually, compare the whiteness and glossiness of the papers.

When a sample is not available, quality inkjet papers have one or more of these specifications printed on the package:

- Weight expressed in either grams per square meter (gsm or g/m<sup>2</sup>) or pounds (lbs.) Papers suitable for inkjet photography are about 170gsm (approximately 65 lbs.)
- Thickness expressed in mil. Look for nothing less than a 7 mil thickness.
- Opacity is measured in percent. Your quality threshold should be about 93% with 96% or more being preferable.



Photo Quality Inkjet Paper



Common Bond Paper

The ultimate test of quality is in the print. Testing papers have been part of photography since the first commercial paper and is an important part of digital photography. Before you make up your mind about an inkjet paper, test as many as you can. Try different brands and different surfaces and print a variety of test images on each paper.

Quality is a measure of how well the paper handles the ink you put on it. Top-flight papers produce sharp, vibrant images with good tonal range in shadow areas. Low quality papers let ink bleed or mingle which blurs and muddies an image. Ink can also soak through into the paper's base causing the paper to buckle and become soft. Ink may even bleed through to the other side.

### PHOTO-QUALITY PAPERS

These papers are specifically designed to continue the standard set by their traditional counterparts. They are heavy and smooth to the touch and come in a variety of surfaces. Brands with an excellent reputation include Arista®, Epson, Ilford, Lumijet and Oriental.

Six-color printers add lighter shades of cyan and magenta. When first introduced, these additions constituted a great leap forward in inkjet imaging. Nearly invisible to the eye, light cyan and magenta allow inkjet printing to reproduce near-continuous tones – a fundamental requirement for photographic-quality images.

There are three or four major companies offering photo-quality printers, but as of this printing Epson currently dominates the photo market. Quality output means sharp, high resolution detail, near continuous tone reproductions; vibrant and accurate colors; good dynamic range; and borderless printing for many paper sizes.

*\*Note: Resolution is associated with both cameras and printers, and is used to describe the potential for detail and sharpness in a photo. To get a high resolution image from your print, keep in mind that you must have quality and high resolution in your camera first.*

### INKJET PRINTER INK

The three prominent categories of ink on the market today are “**Dye-Based**,” “**Pigment-Based**” and “**Hybrid**,” inks. Each has advantages and disadvantages. With Dye-Based inks their coloration is dissolved in a liquid. This allows the ink to be fairly thin and flow easily into a paper's receiving layer. They generally produce vibrant colors, dry quickly and are compatible with a wide variety of papers on the market. Because they are easy to use and produce excellent initial results, a vast majority of inkjet printers are packaged with dye-based ink. But like most dyes, fading caused by UV exposure is an issue and careful display and storage is important. Expect a properly stored dye-based print from a quality paper and ink combination to last from 5-25 years. *Remember, whatever the manufacturer claims, a critical determining factor of how long your print will last is the environment in which it is stored.*

Pigment-based inks have insoluble pigment particles suspended (not dissolved) in an liquid vehicle. Thus, the color is more stable and resists fading much longer than dye-based ink, but colors are not rendered as vibrantly. Also, their more viscous nature makes them more difficult for papers to absorb which makes some papers totally incompatible. Generally matte and fine-art papers work best with pigment-based inks, but other papers work well, too. The important benefit for pigment-based inks is longevity. A properly stored pigment-based print from a quality paper and ink combination can last well over a century!



Epson Stylus Photo 2200  
“Pigmented” Inkjet Printer

Hybrid inks (also called “pigmented” inks) strike a good balance. Nearly as vibrant and easy to use as dye-based inks, they produce beautiful results and are compatible with many inkjet papers. Not quite as stable as pigment-based inks, they still provide longevity estimated to be around three to five decades or so.

The Epson 2200 is an excellent example of a hybrid-ink printer. It is a 7-color inkjet printer that promises archival permanence longer than 1280 printers, but not as long as the old 2000P. It has a color gamut closer to 1280 printers, plus it adds a light black ink to help produce neutral grays. It also features interchangeable black inks allowing the user to choose between the printer's standard Photo Black cartridge or an optional Matte Black cartridge, depending on the paper being used. All of the colors have their own separate ink cartridge.

The latest development from Epson is the 8-color, Ultrachrome, Hi-Gloss™ inkset. It brings back red and blue inks in a new way giving an even wider color gamut than a CMYK inkset without compromising longevity.



Epson Stylus Photo R1800  
8-color Ultrachrome printer

### Second-Party Inks

With the growth in popularity of inkjet printers has come a proliferation of second-party inks to the market. Inkjet printer ink is expensive. Manufacturer's replacement cartridges for many inexpensive printers will cost almost as much as the printer itself. You'll also find that you will use a lot of ink when printing photographs. Second-party inks vary in quality and quantity. Refilling ink is difficult and messy, and in some cases, particularly with some printers from Epson, impossible. Epson's replacement ink cartridges for their printers, for instance, feature a computer chip that gives the user ink level and other useful information. This chip is proprietary and you can't buy second party ink cartridges for these printers that install as easy as the original.

A practical solution is the **Niagara II Bulk Ink System**, by Mediastreet, which offers external ink reservoirs. This system provides longer printing without refills and a low cost-per-page average.

### STORING PRINTS AND GUARDING AGAINST FADING

“Archival” is the hot term in digital printing today, but what does it mean? Archivists are starting to use the term “useful life” as term to describe how long a photograph will last. Materials that will not fade or damage over time stored under ideal conditions are generally deemed archival. Photographs are generally NOT

archival. Contrary to popular belief, typical color prints such as “C type,” “R type” and color snapshot prints from the lab, remain stable for roughly 5-15 years (even when stored in the dark.) On the other hand, properly printed and stored inkjet photographs can remain archivally stable anywhere from 5 to 200 years, depending on the paper you use and based on current testing methods and claims from various manufacturers. Inkjet prints made on “archival” printing papers will generally not fade under dark storage conditions.

For your digital print to stand the test of time, its two components, ink and paper, must both be of the highest archival quality. Another factor is environment. Ultraviolet light is the single biggest cause of inkjet fade. In some instances, noticeable fading can occur in weeks or months. Recent advances have extended ink stability, but by minimizing sun exposure you will help preserve the original beauty of your prints.

Other environmental components can also put your ink at risk. Ozone from some air conditioners, airborne particles from household cleaners (sprayed meters away), and even your hands can be damaging.

Another way to preserve ink is to choose the right paper. A quality paper has a receiving layer that can protect ink from airborne contaminants, oils and lotions from hands, minor scuffs, and even light ultraviolet exposure. The paper must also be archivally stable or it may react with your ink or become brown. Archival quality paper has to be “acid-free.” To qualify, the paper must be pH neutral or slightly alkaline (pH 7.0 to 8.5.)

Ultimately, proper storage is the best way to preserve your prints. Keep prints in archival (acid free) boxes, albums or frames and store them away from light, heat and moisture. You can display your prints, but use **museum board** or **conservation-quality** mat and mount boards like those offered by Neilsen Bainbridge's Alpharag Artcare line. Use Cachet Archival Storage boxes to keep your print protected while in storage or while transporting. Always use glass in your frames and keep photos away from the sun's harmful rays by choosing a room and a wall that does not get direct sunlight.



Cachet Archival  
Storage Boxes

### PICKING PAPERS

The right inkjet paper has the perfect weight, thickness, brightness, and feel. These inkjet papers are made of the finest materials and with longevity in mind. Choosing the right paper is as important as choosing the right printer and can make or break your