# NEWS & TRENDS

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INSIDE



# THE FADE FACTOR

**INK JET PHOTOS CAN LAST FOR YEARS—OR A FEW MONTHS, DEPENDING ON THE PRINTER, INK, AND PAPER. WE IDENTIFY THE BEST PRODUCTS AND DEALS.** BY ANUSH YEGYAZARIAN

ILLUSTRATION: GORDON STUDER

WHEN YOU'VE taken a perfect photo, you want to keep the image fresh for years to come. But for digital shutterbugs who make their own prints, that isn't as easy as it sounds.

Both the paper you choose for your ink jet printer and the ink you use with your hardware make a big difference in whether your snapshot will last or will fade within a year or two—and sometimes whether it will print well at all.

Fortunately, since we first looked at photo-print longevity last year (see find.pcworld.com/31094), manufacturers have made big improvements. For $152, you can buy HP's Deskjet 5550, a *PC World* Best Buy this month (see *Top 10 Printers*, page 149), which produces great-quality prints that should last over 70 years—with the right paper and ink (see "Someday Your Prints Will Fade," page 20), and with the proper care.

As consumers switch from film cameras to digital models in droves, more and more people are expected to face these choices. Lyra Research, which covers the imaging industry, says that 63 percent of PC-owning households print digital photos, and photo printing even accounts for 10 percent of printer usage among people without digital cameras.

To evaluate the best printer/paper/ink combinations this year, we again worked with Wilhelm Imaging Research (www.wilhelm-research.com), an Iowa-based firm whose founder, Henry Wilhelm, has been researching the topic for more than 30 years.

Wilhelm employs special high-intensity lighting and temperature techniques to accelerate the aging process and project print longevity. This year he looked at the latest crop of printers, inks, and papers from the leading printer manufacturers—Canon, Epson, Hewlett-Packard, and Lexmark—to see which produce the longest-lasting prints.

For the first time, the study also tested five common third-party papers sold at computer and office-supply stores. We found some to be fairly good bargains, combining lower cost with acceptable print longevity. But prints made on many third-party papers won't endure long, and in some cases the print quality is so poor, you wouldn't want them around anyway (see "Does Low-Cost Paper Last?" above).

## DOES LOW-COST PAPER LAST?

| PAPER | Display permanence rating (years) | | | | |
|---|---|---|---|---|---|
| | Canon S900, S9000 | Epson Stylus Photo 785EPX, 820, 890, 960, 1280 | Epson Stylus Photo 2200 | HP Deskjet 5550, Photosmart 7150, 7350, 7550 | Lexmark Z55, Z65 |
| CompUSA High Gloss Photo ($0.25 per sheet) | 10 [1] | 5 [2] | n/a | 22 [1] | 5 [1] |
| CompUSA Super High Gloss Photo ($0.37 per sheet) | 9 [2] | 2 [2] | n/a | 16 [1] | 5 [1] |
| Hammermill Jet Print Photo, Professional ($0.50 per sheet) | 12 | 4 [2] | Approximately 30 | 8 | 2 [2] |
| Kodak Ultima Picture Paper High Gloss ($0.87 per sheet) | 7 [1] | 4 | n/a | 21 | 3 |
| Staples Premium Glossy Ink Jet Photo ($0.25 per sheet) | 3 | 2 | Approximately 30 | 2 | 1 |
| *Printer manufacturer's best paper (costs vary)* | *38* | *27* | *More than 90* | *73* | *6* |

n/a = Not applicable; this paper is not suitable for a pigment-ink printer. [1] Inks puddle or resist drying even after two weeks. [2] Visible color distortion or surface gloss irregularities occur (unrelated to fading). See "Someday Your Prints Will Fade" on page 20 for test methodology.

## FEW BARGAINS

FOR THE best longevity and quality, the Wilhelm study confirms that you're better off with the manufacturer's recommended papers and inks instead of the typically cheaper third-party brands.

Bargains do exist: In a few cases, the study shows prints on third-party papers were projected to last as long as 12 and sometimes even more than 20 years (all reported results are for prints framed under glass in a fairly bright room—see find.pcworld.com/31136 for details on the testing procedures). But in many more instances, photos either were projected to fade within a couple of years or didn't print well in the first place. The inks dried improperly and ended up pooling or smudging onto nearby paper; in some cases the photos exhibited defects such as bronzing, in which blacks and other colors take on a metallic sheen. Still, using inexpensive paper for test prints might make sense.

Moreover, paper that works well with one printer may not work well with others. For example, pictures printed on Kodak's 87-cents-per-sheet Ultima Picture Paper High Gloss were projected to last 21 years with HP's printers—a good showing—but just 3 and 4 years with some printers from Lexmark and Epson, respectively. Prints from Canon's S900 and S9000 series should last for about 7 years, but the Kodak paper didn't absorb the ink properly—it puddled on the surface and never dried as it should have.

Hammermill's Jet Print Photo Professional paper did reasonably well with Canon printers, yielding prints rated to last about 12 years, and was fairly good with HP and Epson printers, producing prints projected to last 8 and 4 years, respectively. With Lexmark's printers, however, neutral colors ended up bronzing. At 50 cents per sheet, it was also the second-most-expensive third-party paper that we saw. (We dropped Jet Print Photo Multi-Project Photo Paper from the study because it yellowed after exposure to light.)

Prints on CompUSA-brand papers had good fade resistance; they were estimated to last over 20 years with HP's printers. But the papers consistently had problems absorbing inks and drying properly, or they distorted colors. ▶

IN BRIEF

## Product Pipeline

**SAFE:** Trekstor is now shipping its security-focused USB 1.1 Trek ThumbDrive Touch, which employs biometric technology to authenticate and verify users. Its sensor uses your body's natural electrical charge to measure the difference in potential energy between the ridges and valleys in a fingerprint, and then creates a set of data points to recognize you. Drive sizes range from 16MB for $69 to 128MB for $199, and up to three other users may be authenticated to share a drive. find.pcworld.com/31121


## Tidbyte

**ZOOM:** Want to see what your neighborhood looks like from a satellite? With Keyhole's EarthViewer3D installed on your PC, type in an address and watch the viewer zoom in from outer space to just a few thousand feet above the chosen location. The images shown are built from recent satellite photographs. To use the viewer, your PC must have an NVidia graphics processor (either NForce or a GeForce2 card—or better). You pay nothing for the first 30 days, then $80 for 12 months. Go to find.pcworld.com/31109.

Staples' Premium Glossy Ink Jet Photo paper, at 25 cents per sheet, was the cheapest in the study; but its print life was rated at just 1 to 3 years with most of the printers (although it did not exhibit drying or color-distortion problems).

The Staples and Jet Print Photo papers were the only third-party media able to print with Epson's new Stylus Photo 2200. Like its predecessor, the 2000P, the 2200 uses pigment-based inks, which tend to be more stable than the more common dye inks. That often helps prints resist damage from light, water, and air pollutants, so they last longer. But pigment inks require specially matched papers to ensure that images look good. The Kodak and CompUSA papers couldn't handle the 2200's inks properly, and so were not included in the results. The Jet Print Photo and Staples papers did very well with this printer: Their print life was projected to be approximately 30 years. (As we went to press, these longevity tests were still in progress.)

## PRINTS AND PAPER

WHY DO results vary so much with different printer-and-paper combinations? It's all in the chemistry. Each printer manufacturer has its own set of formulas and creates products that work together to give the best results.

HP has made a particularly noteworthy breakthrough by creating new papers and inks for the company's Deskjet 5550, as well as its Photosmart 7150 ($180), 7350 ($250), and 7550 ($400) printers. Using dye-based inks—including a specially developed magenta—and a new Premium Plus Photo Paper (Glossy), HP's printers produced prints that Wilhelm's study projected to last for 73 years. That kind of longevity rating was previously exclusive to pricey archival printers such as Epson's Stylus Photo 2000P ($899) and 2200 ($699)—and to the best traditional prints from film.

What's more, in *PC World*'s tests of the Deskjet 5550, we found its photo quality among the best we've seen. The model also offers good speeds and reasonable ink costs of 4.4 cents per page for text and 13.1 cents for graphics. For the best photos, though, you'll have to pay for the premium paper, which runs about 80 cents per sheet and is one of the more expensive we tested.

One snag: HP's system has three different ink cartridges, and with the low-cost Deskjet you will have to switch them manually—it can handle only two at a time. The defaults are the regular #56 black and the standard color cartridges, not the #58 photo cartridge (which includes special black, magenta, and cyan inks and must be purchased separately, as it does not come with the printer). You do get the #58 photo cartridge (but not the #56 black) with the company's Photosmart printers, along with other amenities like digital camera media-card slots (for easy printing) or preview screens (on the 7550, which also chooses between the inks for you). You will pay more for those units, however.

Both Canon's printers and Epson's dye-based Stylus Photo printers make prints with good projected longevity: for example, up to 38 years for the $499 Canon S9000 Bubble Jet Photo wide-format printer (see find.pcworld.com/31100) and 27 for the $149 Epson Stylus Photo 785EPX (see find.pcworld.com/31097), often with good print quality as well. (Results apply to other Canon and Epson printers that use the same inks and papers.) But for the longest-lasting prints, you must spend 77 cents per sheet for Epson's paper and a pricey 93 cents per sheet for Canon's. Still, Epson's $99 Stylus Photo 820 is such a good value that you may ▶

## SOMEDAY YOUR PRINTS WILL FADE

| PRINTER/INK | Paper | Cost per sheet | Display permanence rating (years) [1] |
|---|---|---|---|
| **Printer:** Canon S900 Bubble Jet Photo Printer ($349), S9000 ($499)<br>**Ink:** Canon BCI-6 ($72 for six individual colors) | Canon Photo Paper Pro PR-101 | $0.93 | 38 |
| | Canon High Gloss Photo Film (11 by 17 inches) | $5.50 | 12 |
| | Canon Glossy Photo Paper GP-301 | $0.50 | 5 |
| **Printer:** Epson Stylus Photo 785EPX ($149), 820 ($99), 890 ($299), 925 ($299), 960 ($349), 1280 ($499)<br>**Ink:** Epson black cartridge ($25), color cartridge ($22; for 1280, $30) | Epson ColorLife SemiGloss Photo Paper | $0.77 | 27 |
| | Epson Matte Paper, Heavyweight | $0.26 | 18 |
| | Epson Premium Glossy Photo Paper | $0.70 | 5 |
| | Epson Photo Paper, Glossy | $0.45 | 3 |
| | Epson Photo Quality Glossy Film | $0.59 | 2 |
| **Printer:** Epson Stylus Photo 2200 ($699)<br>**Ink:** Epson UltraChrome ($75 for seven individual colors) | Epson Watercolor Paper, Radiant White (13 by 19 inches) | $1.25 | 90 |
| | Epson Premium Glossy Photo Paper | $0.70 | 50 |
| | Epson Premium Luster Photo Paper | $0.70 | 47 |
| | Epson Enhanced Matte Paper (formerly Archival Matte) | $0.32 | 30 [2] |
| **Printer:** HP Deskjet 5550 ($152); Photosmart 7150 ($180), 7350 ($250), 7550 ($400)<br>**Ink:** HP #56 black ($20), #57 tricolor ($35), #58 photo cartridge ($25) | New HP Premium Plus Photo Paper, Glossy | $0.80 | 73 |
| **Printer:** Lexmark Z55 ($129), Z65 ($170)<br>**Ink:** Lexmark black cartridge ($30); color cartridge ($35) | Ilford Printasia Photo Glossy Paper | $1.00 | 6 |
| *Traditional color photographs* | Fujicolor Crystal Archive | $0.30 [3] | 60 |
| | Kodak Ektacolor 8 | $0.30 [3] | 22 |

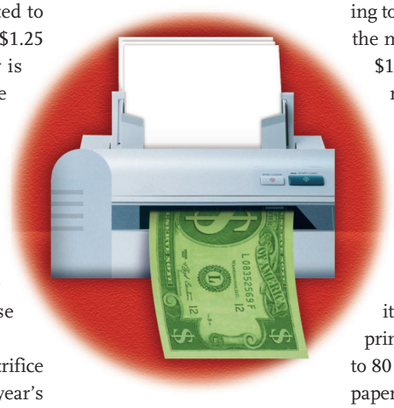
**HOW WE TEST:** Tests conducted by Wilhelm Imaging Research; results provided to *PC World*. Wilhelm Imaging Research tests prints as follows: Prints are carefully prepared and dried for two weeks in a controlled environment, then exposed to high-intensity fluorescent light at a constant temperature and humidity. Data from these accelerated tests is extrapolated to a "real world" display condition of fairly bright room illumination (45 lux) for 12 hours per day, with prints framed under glass. For details on test methodology, see find.pcworld.com/31136. All papers are 8.5 by 11 inches unless otherwise noted. Each manufacturer's ink cartridge is of unique size. [1] Time of display before noticeable fading occurs for prints framed under glass. [2] Prints resist fading to 62 years, but yellowing becomes objectionable at 30 years. [3] Cost of print development not included.

not mind the high paper costs.

Costs are higher for prints with the longest life expectancy. Epson's new high-end photo printer, the 2200, boasts the longest projected print life in this study—more than 90 years—but it costs $699 and paper for prints projected to last longest costs about $1.25 per sheet. This printer is the first model in the mainstream market to print in seven colors (see find.pcworld.com/31106), and it uses new pigment-based UltraChrome inks that produce images that are more vibrant than those from the 2000P.

Those new inks do sacrifice some longevity: In last year's study the 2000P produced images that were projected to last more than 100 years with each of the tested papers, while the 2200's prints should last over 90 years with specialty watercolor paper—but only from 30 to 50 years with all-purpose (and cheaper) glossy and matte papers. Still, all of the 2200's prints should last about as long as the best traditional photographs.

At the other end of the longevity spectrum are Lexmark's Z55 ($129) and Z65 ($170) Color Jetprinter models. But even Lexmark has improved its inks since the last study: Prints made with the recommended Ilford Printasia Photo



Glossy Paper should last six years, compared to less than one year with the Kodak Premium Picture Paper and the Z52 printer tested last year. (Lexmark is the only printer vendor in this group that does not have its own photo paper.) Lexmark's printers are fairly inexpensive and have been well rated in *PC World* tests (see *Top 10 Printers,* page 149).

Overall, we found that you don't have to break the bank to create long-lasting prints. Advances by HP and other companies mean that you can create prints with extremely long life expectancy by using a printer that costs just $150.

In addition, Epson is working to bring pigment inks into the mainstream with its new $149 Stylus C82 (which also made our Top 10 chart this month). The company markets this four-color ink jet printer as a general-purpose model and not as a photo printer (which is the reason we excluded it from this study), but its prints are rated to last for up to 80 years, depending on the paper. If the Stylus C82 is successful, Epson may introduce a six-color version into its Stylus Photo line.

You can also save some money by using third-party papers, though you will have to experiment to see which brands work with your printer. The bottom line: Select your printing hardware and supplies carefully, because printers, inks, and papers are not created equal. ▶

## IN BRIEF

### Product Pipeline

**GET REAL:** Media-savvy PC users tired of launching different applications to access RealVideo, QuickTime, and Windows Media files online can now run all those files with a single tool, RealNetworks' new RealOne Player-Plus Version 2. In addition to playing the three popular media types (and 50 others), the software offers DVD playback and new tools for CD burning. Free to subscribers of RealNetworks' monthly $10 SuperPass service and its $6 RadioPass service, the player also is available for a one-time fee of $30. Get it at find.pcworld.com/31211.

### Did You Know?

IN A GLOBAL SURVEY of more than 225 companies, **33 PERCENT** nearly one-third admitted that they may not be adequately equipped to deal with cyberterrorist attacks on their networks.

SOURCE: INTERNET SECURITY ALLIANCE, NATIONAL ASSOCIATION OF MANUFACTURERS, AND REDSIREN TECHNOLOGIES.

## PHOTO PRINTING OPTIONS PROLIFERATE

How should you print your pictures? Here's a quick snapshot of the most popular methods, with prices, pros, and cons.

| OPTION | Print costs [1] | Pros | Cons |
|---|---|---|---|
| Film photo processors | $0.30 for 4 by 6, $2.30 for 5 by 7, $4.30 for 8 by 10 [2] | No special camera required. One-hour processing widely available. Standard-size prints are inexpensive. | Larger prints and additional copies get expensive, as do special papers. You must print and pay for all shots on a roll to see what you've got. |
| Kiosks (for digital photos, applies to Kodak Picture kiosks) | $0.50–$2.33 for 4 by 6, $3.50 for 5 by 7, $7 for 8 by 10 | Service is becoming widely available. You can print only the photos you want. Basic image editing tools and CD burning may be offered. | Upload times may be long. Print sizes and paper choices are typically limited. |
| Online services (e.g. Shutterfly, Ofoto) | $0.49 for 4 by 6, $0.99 for 5 by 7, $3.99 for 8 by 10 | Services are accessible from home. You can print only the photos you want. Basic image editing tools, online access for friends and family, and many printing options (such as cards and frames) are available. | Upload times may be long. Services may not handle all file formats. You must pay shipping. You must wait for prints. Paper choices may be limited. |
| Ink jet printing | $0.96 per 8.5-by-11-inch page [3] | You can print at home (or on the road with a portable printer). You can select photos, sizes, and number of copies. Image editing is at your discretion. | Learning how best to use printer and editing tools may take time. A PC is usually required (except for printers that accept digital media). |

[1] Prices vary by region and by individual manufacturer and store; prices listed are averages for 24-exposure rolls. [2] Includes development. [3] Includes average cost of glossy paper (about 71 cents per page), with average ink consumption (assumed to be twice that of nonphotographic images; 12.7 cents is about average for color graphics).

ILLUSTRATION: GORDON STUDER