

NEWS & TRENDS

EDITED BY RAMON G. MCLEOD

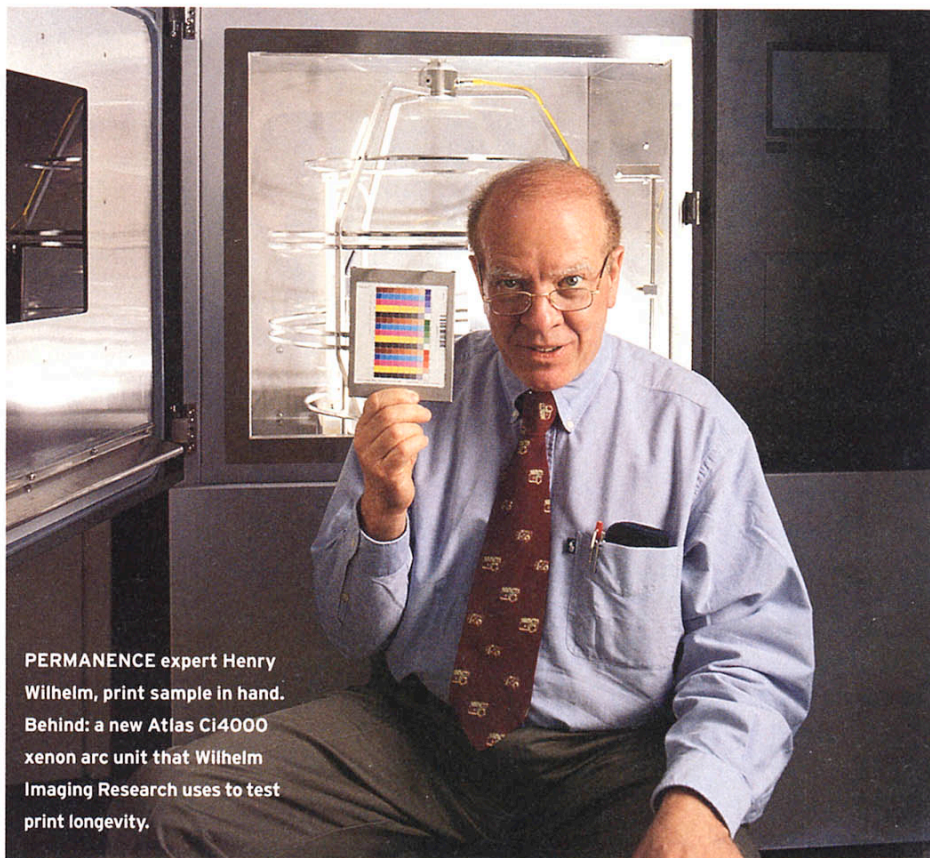
- 28 PREMIUM ISP SERVICES: ARE THEY WORTH IT?
- 32 THE 64-BIT PC IS ABOUT TO BECOME A REALITY
- 32 .ZIP FILE IMBROGLIO OVER ENCRYPTION
- 34 INTEGRATED GRAPHICS GET BOOST IN NEW CHIP SET
- 36 RSS DELIVERS THE NEWS YOU WANT RIGHT NOW

CHEAP INK PROBED

OUR TESTS SHOW THIRD-PARTY INK CARTRIDGES FOR BRAND-NAME PRINTERS CAN PRODUCE QUALITY PRINTS, BUT THEY'LL FADE FAST. PART TWO OF A SERIES. BY DAN LITTMAN

"LOWEST INK JET prices!" "Three ink jet cartridges for the price of one!" "Save up to 80 percent!" With brand-name ink cartridges running \$30 or more, the temptation to buy third-party cartridges at substantial discounts, either online or in stores, is understandable. But how do these inexpensive inks stand up next to their pricey printer-manufacturer counterparts?

To find out, *PC World* purchased inks for three popular printers—Canon's S900, Epson's Stylus C82, and Hewlett-Packard's DeskJet 3820—from several different sellers and compared their print quality and yield with those of the printer vendor's inks. Additionally, Henry Wilhelm at Wilhelm Imaging Research (www.wilhelm-research.com), a leading authority on photo longevity, tested most of the



PERMANENCE expert Henry Wilhelm, print sample in hand. Behind: a new Atlas Ci4000 xenon arc unit that Wilhelm Imaging Research uses to test print longevity.

PHOTOGRAPH: BILL NELLANS

inks for permanence—the durability of the printed image when it is on display and exposed to light.

We found that third-party inks can save you money, and that some produce prints on a par with the output of printer vendor inks. But we also encountered third-party inks that produced poor-quality prints and clogged up printheads. The impact of generic inks on printer warranties is ambiguous. And if you frequently print photographs, you should steer clear of these inks: The prints might look fine, but Wilhelm reported that none of the clone inks he tested came close to matching the permanence of brand-name inks. He rated the best of the aftermarket inks to last only five years (see the chart on page 24).

THE INK ECONOMY

THESE DAYS, you can get a capable ink jet printer for a mere \$50, and a great one for \$150. But brand-name inks are expensive, especially if you print in color: A single photo can cost 50 cents or more, not including the price of paper. Jim Forrest, who edits the *Hard Copy Supplies Journal* at market research firm Lyra Research, says the world's ink jet printers will guzzle \$21 billion worth of ink this year.

Third-party vendors have already grabbed more than 16 percent of cartridge sales, Forrest says, and that percentage is growing. Printer vendors contend that third-party inks can cause myriad problems—some of which, they say, may surface only after prolonged use of the generics—ranging from poor print quality and durability to printer damage. Third-party vendors counter



Some clone inks cost almost as much as their brand-name counterparts.

that printer companies simply want to scare consumers out of straying from the branded inks, which the third-parties claim are overpriced in order to subsidize the artificially inexpensive printers.

To test the quality of our clone inks, we used them to print images on several grades of paper and then rated each image as either comparable to, somewhat worse than, or significantly worse than images made using the printer manufacturer's ink.

In general, most of the third-party inks printed text on plain paper as decently as the printer manufacturers' cartridges did (see detailed test results at find.pcworld.com/36944). Results weren't as good for high-resolution shots on the printer vendors' long-lasting photo papers, but four out of the nine aftermarket brands we tested—Amazon Imaging's ink for the Canon, G&G's ink for the Epson, and Carrot Ink's cartridge

and InkTec's cartridge-refill kit for the HP—yielded prints of comparable quality to those made with printer manufacturer inks. Of the clones, only the OA100 inks for the Canon produced photos significantly worse than those made with a brand-name ink.

But some inks, even those that made good-looking pictures, didn't always work well. All three aftermarket black inks for the Epson C82—OA100 (purchased from PrintPal, www.printpal.com), G&G (from Computer Friends, www.cfriends.com), and the no-name ink whose package had only a rainbow logo (also from Computer Friends)—plugged up the printhead nozzles so quickly and consistently that we had to abort some of our tests. But the color inks from these three companies all worked well in the Epson printer. (We bought a fourth brand of aftermarket ink, Print-Rite, for the C82 but dropped it from our tests, as the printer wouldn't install any of the cartridges.)

CLOGS AND MESSAGES

SEVERAL OA100 cartridges purchased from PrintPal, most notably the black and cyan, frequently plugged the nozzles on the Canon S900's printhead, causing wide blank stripes in documents.

The HP DeskJet 3820's cartridges integrate the printhead and ink supply in one unit that can't be replicated legally, so third-party vendors simply refill used 3820 cartridges. A Printek cartridge we bought from PrintPal had no ink in the magenta tank, but we were able to complete our quality and yield tests with other cartridges. Wilhelm ▶

IN BRIEF

Product Pipeline

HOT NEW PDAs: Hand-spring's Treo 600 (find.pcworld.com/36896), due this fall in versions for both CDMA 1X 2000 and GSM/GPRS networks, is the first cell phone-PDA hybrid to run on the Palm 5 OS. It also boasts a built-in camera and a thumb keyboard. Expect to pay about \$500. Meanwhile, Palm's refresh of its Tungsten T, the T2 (find.pcworld.com/36899), shown above, boasts twice as much memory (32MB), Graffiti 2, and software for playing MP3 files and video clips, as well as for viewing photos. Its estimated street price is \$399. Also available in the fall: Sony's interesting new Clié, the \$700 PEG-UX50 (find.pcworld.com/36902), which includes wireless LAN and Bluetooth networking.



A BEEFIER AOL: New AOL 9 Optimized software, slated to be available soon, is expected to bring AOL closer to par with Microsoft's feature-rich MSN 8 software. AOL 9's QuickViews lets you mouse over icons and preview info, such as the most recent e-mail senders' addresses. Also included: firewall protection, improved e-mail filters, and enhanced instant messaging icons.

was unable to print all four colors satisfactorily with any of the Printek cartridges from PrintPal, but was able to test the same brand of cartridges from another vendor, Top Inkjet (www.topinkjet.com).

We also tried refilling our own HP cartridges with an InkTec kit that we bought from Print Country (www.printcountry.com). What a mess! It dripped ink everywhere, but when we finally refilled our cartridges the ink made decent-quality prints. At Wilhelm Imaging Research, however, the prints produced using the kit were so poor in quality that Wilhelm did not test them for permanence.

And it was in permanence that third-party inks fell short. For example, Wilhelm projected prints made with Epson's C82 inks (colored with pigments instead of less-durable organic dyes) on Ep-

son's most stable (with these inks) paper to last 92 years when displayed, while rating none of the prints with generic inks on the same paper to last more than a year. The HP and Canon inks are dye-based, so their advantage over third-party inks was somewhat less

but still substantial. (Newer HP printers use inks that Wilhelm, in other tests, has found to be far more stable than HP's inks for the 3820.)

MONEY SAVERS?

PRICES FOR THE aftermarket inks we tested varied greatly, and in some cases the clones cost almost as much as the printer-vendor brands. For example, Canon-brand inks

for the S900 (which uses six separate ink tanks) sell for a street price of about \$12 each, while the OA100-compatible inks that clogged the print-head cost only \$5 each from PrintPal. Amazon Imaging (no relation to Amazon.com) black cartridges, however, cost

of the color cartridge (street-priced at \$35 and \$50, respectively). The low-yield HP color cartridge ran out of cyan after 380 pages (ending the cartridge's useful life); the Carrot Ink (www.carrotink.com) and Printek cartridges approached double that yield before running out of magenta.

Do-it-yourself refill kits offer the greatest savings, if you're willing to brave the messy refill process. The InkTec refill kits for HP cartridges contained more than three times as much ink as a cartridge, and they cost only \$10 for black and \$14 for color.

BEHIND THE PRINTS

WHY DID PRINTER makers' products usually deliver better results than their generic counterparts? Printer vendors say they've invested heavily in developing inks, papers, cartridges, and printheads ▶

In permanence, third-party inks fell dramatically short.

\$11 (color, \$10) at Buy.com.

In general, third-party inks for the Canon and Epson printers produced about as many color pages as the printer manufacturer's inks (see chart), though there were some variances.

The situation was different with HP's 3820, which uses two cartridges (one black, the other with three colors). HP sells 19ml and 38ml versions

TEST REPORT

THIRD-PARTY INKS SAVE MONEY BUT GIVE UP PERMANENCE

THE QUALITY OF PRINTS made with third-party inks sometimes equals that of prints made with printer vendors' products; yield (the number of prints) can vary considerably. For additional yield and print-quality results, see find.pcworld.com/36944.

PRINTER	Ink	Cartridge street price	Yield (average number of prints) ¹	Ink cost per page (cents) ¹	Print quality relative to brand-name ink ²	Display Permanence Rating (years) ³
Canon S900 (uses six cartridges)	Amazon Imaging	\$11 black, \$10 color	680	6.7	Comparable	5
	Carrot Ink	\$8	667	5.1	Somewhat worse	4
	OA100	\$5	687	3.2	Significantly worse	4
	Canon	\$12	653	7.8		27
Epson Stylus C82 (uses four cartridges)	G&G	\$17 black, \$9 color	953	5.8	Comparable	0.5
	OA100	\$10 black, \$8 color	1053	4.9	Somewhat worse	0.5
	Rainbow logo ⁴	\$17 black, \$9 color	940	5.8	Somewhat worse	1
	Epson	\$33 black, \$12 color	1113	7.1		92
HP DeskJet 3820 (uses two cartridges)	Carrot Ink	\$21 black, \$24 color	760	4.4	Comparable	1
	InkTec (refill kit)	\$10 black, \$14 color	n/a ⁵	n/a ⁵	Comparable	⁶
	Printek	\$20	700	5.2	Somewhat worse	1.7
	Hewlett-Packard	\$30 black, \$35 color ⁷	380	15.5		15

FOOTNOTES: ¹ Calculations based on 5 percent coverage per color per page. For the Canon printer, our test prints used only four of the six ink tanks. ² Prints made with printer manufacturers' longest-lasting photo paper. ³ Tests conducted by Wilhelm Imaging Research (www.wilhelm-research.com); 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, and then exposed to high-intensity fluorescent light at a constant 75 degrees Fahrenheit and 60 percent relative 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 additional details on test methodology, see find.pcworld.com/31136. ⁴ This ink came in a white box with nothing on it except for a rainbow logo. ⁵ Not applicable. Cartridge refill kits hold more than three times as much ink as HP's black and 19ml color cartridges do. ⁶ Wilhelm Imaging Research was unable to produce prints suitable for testing. ⁷ Price is for a 19ml color cartridge. HP's 38ml cartridge is \$50 (street).

OUTPUT COMPARISON

CLONES VS. BRAND NAMES: PRINT QUALITY VARIES



A PRINT MADE using Amazon Imaging inks for the Canon S900 (center) is a bit washed out compared to the one made with Canon inks (left). But a print made with OA100 inks (right) has a yellowish cast.

that work together. For example, John Stoffel, HP's ink jet technology manager, says third-party vendors can't fine-tune fluidity so that their inks spray properly onto the paper.

Often, aftermarket retailers buy prepackaged inks from manufacturers—many of them in China—which makes it difficult for the retailers to know exactly what they're getting. But some third-party ink companies do exercise direct control over their products. Gary Miller, Amazon Imaging's sales vice president, says his company makes its inks and uses cartridges made of polypropylene, a high-quality material that printer vendors use, instead of cheaper plastics that can damage the ink if it's stored for several months.

INK AMBIGUITIES

BUYING third-party ink online can be frustrating. Some retailers' Web sites don't identify products by name, only by printer or cartridge compatibility, so getting a steady supply of an ink you like can be a challenge. Computer Friends, whose generic inks are unidentified on its Web site, sent us G&G ink to fill most of our initial order for Epson C82-compatible ink but completed

the order later with a different brand. (The company fulfilled our request for a specific ink brand, however.)

Another murky issue relates to warranties. All the manufacturers' warranties for the printers we used state explicitly that they don't cover damage caused by other vendors' ink. But third-party vendors say the federal Magnusson-Moss Warranty Improvement Act forbids companies from dictating customers' choice of aftermarket products.

Ron Katz, a patent attorney with the firm Manatt, Phelps, & Phillips who has litigated on behalf of aftermarket vendors, says that "mere use of a third-party cartridge does not void the warranty if the cartridge does not cause the damage."

Tricia Judge, executive director of the International Imaging Technology Council, an association of aftermarket vendors, says that if a generic cartridge does damage your printer, reputable third-party ink sellers will repair the printer. However, none of the generic-ink sellers' warranties for the products we tested addressed this situation.

The IITC is working with the American Society for Testing and Materials to develop

tests of yield, image density, and ink fastness. It has also partnered with the imaging lab operated by the Rochester Institute of Technology's National Center for Remanufacturing and Resource Recovery to test and certify products. Judge says she expects the program to result in a certification sticker on boxes for the inks that meet basic standards. Printer vendors seem receptive to the idea of quality-control testing: "We are all for standards," says Pradeep Jotwani, vice president of HP's Imaging and Printing Group.

WORTH THE RISKS?

IN THE MEANTIME, judging from our experience, finding a reasonably priced substitute for brand-name ink can be a risky business. If top quality and print longevity aren't of paramount importance, you can save money using no-name inks—but you may have to spend a lot of time cleaning clogged printheads. Still, some users may find the savings justify the hassles.

If print quality—and especially durability—are a top concern, however, you're better off playing it safe by gritting your teeth and shelling out for brand-name inks. ■

IN BRIEF

Did You Know?

SPAM Watch Lost productivity related to spam costs companies an average of \$874 per employee per year, says a study conducted by Nucleus Research, which surveyed 76 U.S. companies, talking both to employees and IT managers about their spam experiences. That figure is based on a 2080-hour work year and hourly pay of \$30, the study says. find.pcworld.com/36938

\$874

Product Pipeline

SERIOUS SAVINGS: Ink jet printing hits a new low with Hewlett-Packard's new printer—a new low price, that is. The compact HP Deskjet 3520 color ink jet printer prints at 2400 by 1200 dots per inch, comes with a fold-up paper tray, and carries a \$40 price tag. find.pcworld.com/36719



BEND IT GOOD: Does your thumb-drive storage device get in the way when it sticks out from your laptop's USB port? Ideative's \$13 FlexUSB allows you to rotate the drive up to 90 degrees in all directions. The device works with USB 1.1 and 2.0 devices. find.pcworld.com/36731



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