Ricoh's GX5050N and GX7000 piezo printers.

The Road To Sublimation Success

Full Throttle: Move Over Epson!

By David Gross

"'But I don't want to go among mad people,' Alice remarked.

'Oh, you can't help that,' said the Cat: 'we're all mad here. I'm mad. You're mad.'

'How do you know I'm mad?' said Alice.

'You must be,' said the Cat, 'or you wouldn't have come here.'"

- Lewis Carroll from Alice in Wonderland

Three things: computer, printer and heat press. These are the main components of the sublimation transfer process. Every year that goes by we see changes and advances in these three areas. Computers get better, faster and (unlike most other things) cheaper (check out Moore's Law sometime at Intel's website). Software advances include CorelDRAW® X4 (version 14) and Adobe® Photoshop® CS4 (version 11). Heat presses have gone digital. What about printers? I personally think that the printer component

of the process, with Epson being the only desktop choice, has offered the least variety and has been the slowest to evolve.

Why have we always used Epson printers for desktop sublimation transfer? Three reasons: they are inexpensive, they are easy to buy, and Epson has been the only major name to use piezo print head technology. Piezo printing technology vibrates the ink out of the nozzle instead of boiling it out like thermal drop-on-demand technology does (used in most

other brands of inkjet printers such as HP, Canon and Lexmark). Since sublimation inks are heat-activated, boiling the ink out of the nozzle just won't work—but vibrating it out does. This is why piezo print heads are so important, and why Epson is the dominant printer manufacturer in this industry. That is, until several months ago when things changed radically for the better—and will never be the same again.

For some eight years, using the Law of Attraction, I've thought about what the perfect sublimation printer would be: Inexpensive (under $300 for letter/legal and under $1,000 for tabloid), highly reliable (high duty cycle of 10K prints per month), built-in ink system with large cartridges, wickedly fast (like a laser printer), and expandable paper handling (more paper trays). Finally, after all this time, we now have printers like this and from a surprising source—Ricoh! Although I had visited Ricoh several times early in my career, I was unaware they made inkjet printers until last year. Most people know them for their copiers.

MEET THE FAMILY

We have adopted two printers from the GX series (which is Ricoh's second generation after the G series inkjet printers): the GX5050N and GX7000. They are a perfect fit for our world and fit my wish list like a glove. They are low-cost, wickedly fast piezo printers!

Ricoh has several key differences from Epson. First is their market focus. Epson goes after the photo market and Ricoh after the office market. The office market requires lots of speed, paper capacity, reliability, and high duty cycle. Their ink technology is called Gel, which is just a thicker, more concentrated ink. They also use a paper transport system that comes right out of their laser printer design handbook (see the sidebar below titled Ricoh's Secret To Speed). Visit www.gelsprinter.com for great info on Ricoh's technology.

RICOH'S SECRET TO SPEED

Taken right out of the laser printer playbook, the Gel printers use a permanent electrostatic belt to hold and move the paper while printing. This belt allows both very high speed and precision printing.

From a green point of view, these printers are perfect for printing because they use ink (no drum units or belts to clog the landfills), consume very little electricity (they don't need a fuser unit to melt toner onto the paper), and because Condé offers an ink cartridge recycling program.

THE NEED FOR SPEED

Our two printers are true speed demons. My tests put Epson printers to shame (see Chart #1: Print Speed Comparisons).

Chart #1: Print Speed Comparisons

	Ricoh GX5050N	Ricoh GX7000	Epson 1400	Epson 4800	Epson 4880
8.5"x11"	:12	:25	1:51	1:48	1:45
11"x17"	N/A	:44	3:10	2:55	2:48

Interestingly, the GX5050N prints about twice as fast as the GX7000. This appears to be because of a larger print head. The GX5050N was designed before the GX7000 and was designed to win the speed contest.

These printers are fast enough to finally meet my goal of true on-site event printing. You'll be able to easily produce products while at pet shows, car shows, and other events.

PAPER HANDLING

Each printer has one built-in paper tray with a 250-sheet capacity. The 5050N supports letter and legal size paper, and the 7000 supports sizes up to 11"x17". Unlike Epson printers, the Ricoh printers can grow with optional paper trays. Each printer supports an extra bottom tray (500-sheet for the 5050N and 250-sheet for the 7000) and a multi-bypass tray attached to the back (100-sheet capacity). The 7000's multi-bypass tray supports our all-important 13"x19" paper

size. So think of it: with a fully loaded 7000, we can have three different paper sizes loaded at the same time! No more swapping papers in a single tray. No more forgetting to load legal paper when doing Unisub license plates or 13"x19" for large glass cutting boards. You can even program the size of each paper into the front panel so that the printer automatically pulls your chosen paper size from the correct tray. This really works well in a multi-user environment.

PRINT QUALITY

I typically ignore printer specs and instead judge printer output with my eyes. When comparing the two on hard and soft substrates, it's difficult for me to tell the difference. On paper, the Ricoh printers deliver 1200 dpi quality. The Epson printers, capable of 1440 dpi printing, are set to 720 dpi mode for sublimation transfer. I do recommend that each new installation run through the "Paper Feed Adjustment" to align the printer. This reduces the banding that sometimes can be seen on the Gel printers.

COLOR MANAGEMENT

In order for photographs and spot colors to print correctly, we need color management. What does color management do? Sublimation inks and normal inks work very differently, so we have to limit the amount of ink used in the correct proportion to get the right results. We offer two solutions: ICC profile or PowerDriver.

ICC color profiles are the industry standard way of handling colors with printers, scanners and monitors. At Condé, we have our own color department that creates color profiles for sublimation. We provide profiles for both the 7000 and the 5050N. These profiles are used with the Gel driver and are supported under all versions of Windows 2000, XP, Vista 32 and 64 bit versions, and Macintosh OSX. ArTainium ink users are familiar with ICC profiles. Since ICC profiles use the standard Ricoh driver, all features of the printer and options are available. As a footnote, I am already running the Gel

printers with our profile under Windows 7.

The PowerDriver is Sawgrass' traditional solution for SubliJet users. It provides the color management features inside this printer driver. When you print to the PowerDriver, it corrects the colors and then sends the print data to the Gel driver. So you must install the Gel driver also. At publication, the PowerDriver was only available for the 7000 for Windows XP and Vista 32 bit.

For selecting spot colors, I recommend reading my article: "Street Smart Color Matching" published in a previous Sublimation Almanac. It is posted on our web site: www.conde.com.

FRONT CONTROL PANEL AND DISPLAY

Both printers provide a display similar to what we find on the Epson 4000 series printers. Some good news is that the display shows current ink levels, but the bad news is that the levels are not accurate—showing lower ink levels than reality. For example, one bar represents 20%, but it really means that the ink level is between 20-39%. To find the exact levels, we need to go into the service mode of the printer (if you really need this, give me a call). In addition, we can define what size paper is in each tray, perform a nozzle check, head cleaning, or print head alignment—all from the front panel.

INKS: THE BLOOD OF SUBLIMATION

These printers use the new SubliJet-R inks from Sawgrass. This unique higher viscosity ink formulation (called Gel ink) is loaded into four fairly large cartridges. The CMY cartridges hold 60ml of ink and the K holds 65ml.

Question: Since the Gel printers only have four colors, how does this compare with six- and eight-color printers? Answer: Very little difference. This is because the extra colors are diluted versions of the other inks and do nothing to extend the color gamut or range. They only serve to improve the lights and mid-tones of photographs. Since

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we print with the medium-quality mode on normal paper and then sublimate, it is just about impossible to take advantage of those extra colors. Fewer colors mean it is simpler and costs less!

When installing the first set of inks, the printer will pull lots of ink from the cartridges to fill the ink tubes (see Chart #2: Percentage Of Cartridge Ink Used To Charge The Ink Lines). Although charging the ink lines leaves your cartridges looking drained, the inks have merely moved from one spot to another. Charging the ink lines won't be necessary for subsequent cartridge replacements. The higher GX5050N numbers are due to extra ink channels for magenta and yellow.

Chart #2: Percentage Of Cartridge Ink Used To Charge The Ink Lines

	Cyan	Magenta	Yellow	Black
GX7000	18%	18%	18%	16%
GX5050N	20%	34%	34%	18%

CLOGGING

The first question I get about the GX series printers is, "Do they clog as often as my Epson printer?" My experience is that they are much more robust printers and have far fewer clogging issues. This is due to several factors: the pump that pulls the ink to the printhead has more pressure

than Epson's, the printhead was designed for high speed/high volume applications, and the built-in ink system. No matter what the reason, the results are impressive. Yes, you still need to do a nozzle check at the beginning of every print day and whenever you suspect there is an issue. I do recommend products like Harvey Head Cleaner to do an automatic print on days when the printer is not in use.
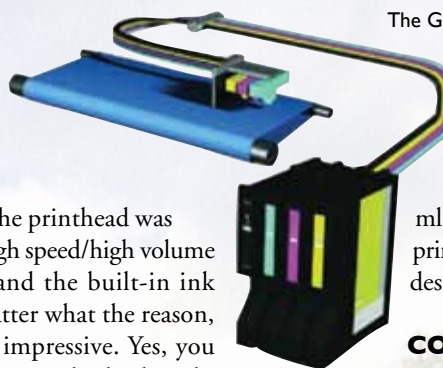
PAPER

Because of the Gel printer's print speed, only very-fast-drying sublimation release papers should be used. The DyeTrans SPP paper has proven to be an excellent choice for the Gel technology. Other popular papers such as TexPrintXP have issues with high saturation images and should be used with caution.

FUEL ECONOMY

How does Gel ink usage compare to Epson sublimation inks? After much testing, the results are nothing short of earth shaking. Every ml of SubliJet-R sublimation ink translates to three ml of sublimation ink for the Epson's.

My standardized test image uses about .77 ml on an Epson desktop printer and about .24 ml on a Gel printer. This puts the cost of printing that letter-size test image at $.44 compared to $.91 for the Epson 1400. This means that even though the cost per ml of the Gel inks is about $1.83 per

ml, the Gel series printer's cost of printing is less than half of Epson's desktop printers!

CONNECTIVITY

Both printers support a USB 2.0/1.1 port. The 5050N has an Ethernet 10/100 built-in, with this being an option on the 7000. Since the printer supports multiple trays, this really becomes a network printer capable of multi-user printing.

RESULTS FROM THE ROAD

After about four months of installing and supporting the GX7000 and the GX5050N printers, the results are nothing short of amazing.

My staff and I have installed almost all the GX7000 and GX5050N printers for sublimation and have encountered few issues. We have developed a precise installation methodology to insure success. See our videos and PDFs. Please follow our instructions!

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