



FLAAR Reports

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Quick Peek

at What New Printers to Expect in 2008



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People keep asking us for help deciding what printer they should consider. Often they say, “Nicholas, I don’t want to buy old-technology that is already obsolete. What new printers should I be looking at?”

Every one of our 174 FLAAR Reports titles is a response to someone’s question. So for 2008 we are again updating this FLAAR Fast Facts to answer all the people who have asked for “What is coming out during 2008 that’s new?”

You can use basic intuition to estimate what new printers are likely to appear this year.

How?

Just look at how long a particular printhead technology or overall print engine has been around.

- After one year their competition has something new
- After two years more competition has newer (and/or better) products
- After three years they are stale and the competition is better at lower price too.

So, when printers get stale the company needs to produce a new model or lose market share.

Then look at where the market is going: fine art, giclee, and décor are hot markets right now. Mild-solvent is a booming business. Flatbed printers with UV-curable ink are rising stars since prototypes from 1999-1001 became mature by 2002.

Manufacturers want to produce new printers for the hot markets. So estimate which company might most likely produce the needed printers. You can also use the process of elimination: neither Canon nor HP are likely to produce their own solvent ink printer¹, or even mild solvent (can’t get it through thermal printheads anyway). Epson can go into the solvent-ink market because its piezo heads can handle solvent inks. There is a separate FLAAR Report on “what’s new for 2008 in solvent and UV printers.”

Then take note of what new developments were shown quietly at earlier trade shows but not yet launched as formal products. For example, HP showed a completely new giclee workflow at three trade shows in a row (ArtExpo and DecorExpo, both New York, and Atlanta). FLAAR already has full FLAAR Reports on this giclee workflow.

But the primary incentive to produce new printers for 2008 is the fact that DRUPA is the world’s most prestigious showcase for new printers. DRUPA 2004 trade show was held in Germany four years ago. DRUPA is held only every four years, so many companies work hard to get some new product ready to show here in 2008. DRUPA occupies about 24 giant trade show buildings of Germanic proportions. So by May 2008 there will be quite a lot of new printers to talk about. So let’s concentrate on 2008, since you need a new printer now. If you wait until 2009, your competitors will get further ahead.

Add up all these factors, and you too can predict what will appear this year.

¹The HP 9000s and 1000s are rebranded Seiko printers. The other HP solvent machines are rebranded from Scitex Vision (which HP bought outright).

Kodak-Encad

Even though Encad was fading when Kodak bought it, and even though Encad faded even faster under the Kodak brand, they are not as totally lifeless as they appear. Even though Encad is assumed DOA, and even though the Encad staff was supposedly disbanded over a year ago, still in 2007 Encad printers were being advertised and sold.... by Xerox. So it is worth going into recent Encad history to see what might still resurface under a Kodak brand name in 2008.

There has not been any new printer from Encad for four years. Hence this year we can hope for an unlikely Kodak attempt to get into the healthy market for high-quality photo printers (now dominated by Epson and HP). But the more likely option (if any printer appears at all, which is uncertain) would be a printer for the reprographic, quick print, print-for-pay market. The advantage of the print-for-pay market is that output does not have to be the close-up quality of Epson or Canon. Most POP signs are viewed from several feet away, where Encad quality looks acceptable due to its deep saturation caused by heavy ink laydown.

Holding them back is primarily a lack of a top notch printhead. Encad uses Lexmark printheads which are made for pie charts and bar charts. Epson, Canon, and HP heads offer higher print quality. But Encad does not have access to any of these printheads. All the printhead patents are owned by their competitors. The only high quality printhead available to Kodak was from Brother; but the last one Kodak tried had too many banding defects. Kodak did recently buy the Scitex Digital Printing company, but their page-array printing technology would take gazillions to move into the mass market for desktop or office printers.

Since Kodak on its own can't easily achieve the dpi of Canon or Epson, Encad is working on speed. The last model they tried on speed, the Kodak 5260, failed because of a quirky system trying to pull the media through rather than feeding it and lack of enough media that would dry fast enough. So this time it appears they are beefing up the drying system.



Kodak Kodak1200i Encad printer at Istanbul 06

It is sad that Lexmark has taken so many years to update their printheads. The other downside of Encad printers was lack of any totally new and improved ink delivery system. Each new NovaJet was sort of a tweaked version of the previous one. So today all current Encad models have essentially the same basic ink delivery system from the 1990's, with improvements patched here and there. The person that Kodak put in charge of Encad was in charge of XES when this branch of Xerox went belly up. Well Encad also went belly up.

A year ago (February 2007) I visited a print shop that had three Encad NovaJet 1000i printers. He said that in the last several years that Kodak had to replace them about nine times. In other words, on nine occasions the issues were such that it was easier for Kodak to roll the old Encad out the door and ship in a completely new one. After all, there are warehouses full of new or reconditioned unsold Encad 1000i and Kodak 1200i (the essentially identical printer). The owner of this print shop (who also has a Durst Rho 160uv and a ColorSpan 72UVX) said that the color was especially unreliable on the Encad 1000i. It is no wonder that the company went under.

A totally new design, and a drastically updated printhead, would combine to produce something worth looking at. But with both Encad and Kodak laying off their best people, it is hard to believe there are enough engineers left at Encad or Kodak to be able to create a really spectacular new printer that could possibly compete against HP, Canon, or even Epson.

Kodak on its own, without Encad

The head of Kodak is a former executive from HP, with experience in wide format inkjet printing. The failure of Encad is a result, not of him, but a failure of the core Kodak philosophy of shifting Kodak people into new acquisitions, to rein the newly acquired companies in to the Kodak style. Unfortunately the Kodak style tends to result in the demise of most new divisions. This is unfortunate since I have met many capable and pleasant Kodak executives; but inkjet is a world of its own, and you can't merely operate like you are selling yellow boxes of Kodak film. That does not work when trying to sell inkjet media: putting it into a yellow box does not help when sign shops learn it comes from China.

For the last two years there have been rumors that Kodak was going to release some new technology desktop inkjet. Desktop sizes are outside our coverage; we handle only 17" and wider. But since Canon, Epson, and HP already own the market for desktop printing, and since RISO and others are trying to muscle in too, it will be close to suicide for Kodak to attempt to launch a new printer. The brand name of Kodak has been battered by being the name on too many failed digital products, most painfully in pro 35mm cameras. Finally (early 2007), Kodak did indeed release a new desktop printer, but its main claim to fame was cheap ink!

There are also questions of to what degree is Kodak was keeping alive the last Encad dream of a one more wide-format inkjet printer. Encad killed off their solvent printer development project (ironic, since solvent printers are what kept ColorSpan alive for two years until the ColorSpan UV printer became so popular). But Encad was surely working on several new printer projects when it's offices were closed in California. It would be logical for Kodak to try to rescue one of these future printers. But if it has any leftover technology from an Encad or from the ill-fated Kodak 5260, it will be born crippled with poor DNA.

If this printer has a page array (an array of printheads the width of the entire page), and if it has no banding, then it has a slight chance. But a page array, unless there is a back-up array too, has trouble correcting for one nozzle being out, because a single page array can't do back-and-forth interweaving to overwrite the bad nozzles. Since Canon just spent one billion dollars to develop its iPF inkjet printers, and since HP also spent about one billion dollars in recent years to develop it's Z-series 12-channel printers, it will be unlikely that Kodak can come up with this much R&D funding. Most industry analysts agree that for Kodak to attempt to attract attention with any wide-format inkjet printer it will be unlikely, unless it is



Kodak 5260 printer at GraphExpo 02

- Flawless quality (otherwise, why bother since Canon and HP already offer quality)
- Must have no banding (banding was a problem with the last Kodak printer that failed)
- Must have more than one or two media that work with it (another problem with the failed Kodak-Encad 5260)
- Must have incredible speed (and quality, both at the same time)
- Will need to convince people that the printer really works

Not using the Encad name will help a bit, but the name Kodak does not instill the sense of quality any more either. Their last two professional 35mm cameras, the infamous Kodak N, and the definitely better but still tragically flawed Kodak SLR/n, caused the demise of their entire Kodak pro photo division. A year later their entry-level photo division went bust too.

At Photokina 2006 the huge Kodak booth (an entire hall) had no products anywhere except in one tiny corner. It was the largest, most embarrassing empty booth at any trade show I have seen in the last eight years. By late 2007 we heard through the grapevine that the last traditional wide-format inkjet printer in Kodak's R&D department had been cancelled. At least Kodak executives are realistic; finally. Show wide angle views of this empty area: do an entire photo essay, Photokina '06

But Kodak managers presented new technology at an IMI conference in Lisbon, autumn 2007, so they will try to move ahead in continuous inkjet for transactional printing. Kodak has also developed a MEMS printhead. But in it's advertising slogans, Kodak tries to stir up memories of its former days of glory, when Kodachrome and Ektachrome and Plus X and Tri X were mainstays of photographers around the world. But memories won't sell digital imaging products.

New wide format printer technology is good for everyone, so we hope that indeed there is a new wide-format inkjet printer from Kodak. Our reviews of the Encad printers were proven correct; our review of the Kodak 5260 was the only publication in the entire industry that told the truth about this flawed technology. The industry itself lauded the 5260 with awards for "the best printer of the year" and "best printer of the trade show." Instead FLAAR pointed out that the printer could not function more than a few hours without breaking down (our report is a classic in journalism).

If any new Kodak printer functions better, we will be the first to say so.



"Here you can see the entire area is TOTALLY EMPTY, the most embarrassing trade show booth of any major trade show in the world. Effectively they don't have many products left to offer the general public: the Chinese took over the point-and-shoot camera market; the Japanese took over the 35mm digital SLR market; HP, Canon, and Epson took over the water-based printer market."

Hewlett-Packard

Thermal printheads allow for more nozzles; nozzles are the horsepower of inkjet printers, so HP can (normally) achieve more speed than any piezo printer. Unfortunately Canon developed its thermal printheads even faster.

Piezo printheads allow for small picoliter size, so Epson features picoliter size in its ads, as if that is what defines quality.

Each company tries to convince buyers that its features are crucial.

The job of FLAAR is to sort through all this and assist the end user into figuring out which printer technology and which model is good for the application at hand.

If you wish a production printer, made for sustained commercial production, you will tend to find that HP printers are higher quality in design and longevity as a machine than Epson printers. The best example would be the venerable Designjet 5000 and 5500. Indeed an Epson manager told me that we should not judge its printers harshly in reviews because it considered its desktop printers such as 1520 and 3000 to be “disposable.” This is a fact seldom mentioned in ads or reviews.

HP tends to be more friendly to after-market media. With an Epson the system is arranged to work primarily with Epson branded consumables. They work great, but you pay the price. With HP, they work best with HP branded inks and media too, but it is easier to utilize after-market media. As a result a wider diversity of after-market media is available for HP than is available for an Epson.

It is the tradition for printer manufacturers to show their new technology at desktop sizes, and then to release this technology at 24” size and then wider. So the HP B9180 of 2005 ushered in a new era of advances for HP that we can expect will result in eventual replacement for the venerable HP 5500.

The HP Z2100 was the first salvo. The HP Z3100 was the second salvo. These printers had a complete spectrophotometer inside, and sophisticated profiling software as well. Although ColorSpan had color management capability inside their printers many years ago already, the new HP system is at an entirely new level. And also realize that what you see since the introduction of the HP Z2100 and Z3100 is only their first generation. HP already showed much more at several trade shows as far back as two years ago.

These were 24” and 44”. All previous HP printers were 24”, 42” and 60”. But since Epson was 44”, HP understandably switched from 42” to 44”.

But for 2006 there was no 60” replacement for the HP 5500 (for good reason, the HP 5500 is such a good workhorse it does not really need to be replaced).

But, giclee studios still prefer to use an Epson, or to experiment with the 60” Canon iPF 9000. To stay competitive, HP needed to issue a 60” (or wider), replacement during 2007 for the legendary HP 5000. This new HP printer, Z6100, finally appeared during 2007, but it was 8 inks (for speed), not 12 inks.

Since there are 8-channel and 12-channel 24” and 44” HP Z-series printers, and since Canon already has a 12-channel 60” printer, HP will continue to lose sales to Canon until they too offer a 12-channel 60” machine. Since the 8-channel models came out first, that is the most likely printer that is still missing: a 12-channel 60” printer. But HP may decide they don’t need 12-channels for 60” and stick with the Z3100 for the print people who prefer 12-channels. Of course the print people who prefer 12-channels can now select a Canon.

Since Canon beat HP to the launch of a 12-ink printer, and since Epson beat both with an 8-ink printer, HP has to produce features that are better than Canon's speed and better than Epson's popularity. This was actually already exhibited and is already in FLAAR Reports, but the HP advances which were described in our reports was never officially launched. But with DRUPA coming up, you may get some surprises.



Canon

Canon had four new products several years ago: imagePROGRAF 6200, 7200, 7250 and 8200. What came out already in 2006 are continued advances in this superior type of thermal printhead technology moved into a tabloid size for the desktop.

The Canon 7250 and 7200 uses dye ink; 6200 and 8200 offers pigmented ink. Output is quite impressive. We have full reports on the 8200 and 7250 (valid for the 7200 which is same technology, just wider).

Then Canon came out with the w6400 and w8400. Their 60" printer waited until the new 12-channel technology and came out during 2006; it has been pictured already in an Italian trade magazine in 2005. But most of the people that Canon gives free cameras to, the Canon Explorers of Light, they not only use Epson printers, they promote Epson printers at Epson trade show booths and at Epson trade show parties. In any event, Canon has great technology and if they can understand that photographers want a reasonable evaluation, and not a banner ad and a phony Success Story attached to the banner ad, then they would sell more than the 5% market share they have been with for the last year.

In effect, Canon offers futuristic technology already today. But the other problem is that end-users think of Epson or HP, or even Encad, when they think of wide format printers. Most end-users don't consider Canon. This could be overcome with public education; Canon tried that with millions of dollars of advertising. But people still yawned. Canon never considered that perhaps they were advertising in the wrong places. Besides, it is public education, not "advertising" which will get the message out. As an institute at a large state university we have experience with how education can do a better job than mere advertising.

Since selling wide format inkjet printers through traditional Canon copier channels did not work, Canon is now trying to sell through camera dealers. Canon is putting pictures of its printers into all its camera ads. Well this will sell a few, and Canon sales were helped when Encad finally went out of business. But it's tough for Canon to come close to Epson or HP. Yes, their market share will rise, but low compared to what Canon deserves if you look at their technology and brand name. Even Xerox was selling more rebranded Encad printers than Canon was selling their own imagePROGRAF printers. During 2006 Canon picked up a bit more market share, in large part because Encad disappeared that year.

During 2006, Canon came out with the iPF 5000, iPF8000 and iPF9000. For some reason they did not issue a 24-inch version. This will be their model iPF6000 and was due in early 2007.

Unfortunately the new Canon iPF printers were clobbered by user group chatter that lambasted the overly grainy appearance. FLAAR was busy with UV-cured wide-format printers that year, and did not evaluate any of the Canon printers. Since then Canon has come out with replacements to try to overcome the bad publicity. But FLAAR has still been busy elsewhere, and has not yet evaluated the newest Canon printers in detail because of the demand for our services in the world of UV-curable flatbed printers.

Once HP released 8-channel printers, Canon came out with their response: the Canon iPF8000s and Canon iPF9000s. s=Speed.

Since Canon showed all their cards in 2006-2007, what is likely in 2008 are firmware updates to improve the glitches that dozens of user groups reported, namely the grainy appearance.

Since FLAAR is independent, we can produce innovative educational programs to help photographers, corporations, franchise owners, and every level of print shop owner learn about printhead technology,

speed, and image quality, We are not stuck with any corporate tradition that relies merely on old-fashioned advertising.

There is a difference between advertising, PR, and education. As a university-based institute, we understand education, including public education. You can achieve results through independent education that won't happen merely by lots of money in advertising and PR releases.



Canon iPF 5000 at PhotoPlus 06



Canon iPF 8000 at PhotoPlus 06

Epson

Epson had been the most innovative manufacturer in the last several years and has produced the highest “wow” factor.

Their hot products were the Epson Stylus Pro series, 4800 7800, 9800. But then Canon came out with three new iPF printers. Then HP came out with two new Z printers (with the Z6100 to come in 2007). So by the end of 2006, Epson was left behind. Every professional giclee atelier that I know was abandoning Epson printers totally (fed up with expensive waste of ink while purging). The people who stick with Epson were the faithful pro-sumers, individual artists, and printshops that don't need to produce tons of output (Epson is too slow, and ink is too expensive to produce tons of output, especially now that Canon has faster printers available).

So after many years of being the most desired and innovative printer, Epson has been overtaken by HP and Canon. At the last several trade shows during 2007 I did not even take the time to look inside the Epson booth: there were too many innovative printers elsewhere, in the HP booth, in the Canon booth, and in booths where UV-curable printers were being shown. We will indeed evaluate the new Epson printers, but it is sad to see such an innovative company slow down so dramatically, at precisely the wrong moment: when their competitors have speed ahead.

Epson has been downsizing as a result of all the new printers by first Canon and then HP. At every trade show in late 2007 and now in 2008, I keep hearing about another Epson manager who has left Epson and now is working for either Roland, or Canon or other competitors. If any more new products come out this year from HP, Epson will continue to be overtaken by the two billion-dollar powerhouses: HP and Canon.

However at FLAAR, we have three Epson printers: 4000, 7600, 7800. We use them every day at the university (also use the HP 5000 every day on canvas). We are content with these printers (to answer a frequently asked question, no, we do not have an HP Z2100 or a Z3100).

Yet the Epson R800 is the product to really watch. As soon as this appears in wide-format size (wider than the R2400), perhaps Epson can get back some of its lost market share. Epson does its homework, listens to what people ask for, and then develops these features as quickly as possible. Epson is the best example of a company that interacts with its faithful public supporters. It is like the Macintosh phenomenon. People just love their recent model Epson printers.

What would be nice to see from Epson would be the technology in their letter-size R800 available in a 24”, 44”, and 60 or 62” model. Eight or even twelve colors would be great too, plus a gloss optimizer.

And for digital camera fans, Epson has their P-2000 and P-4000 LCD viewers, “Photo Viewer P-3000.” Here both Compaq and Dell, missed the boat totally. A photo viewer is an intelligent product. If you do professional digital photography, you need one of these Epson photo viewers for sure (though Apple's iPod can handle a photo archive very nicely nowadays).

The rumor for years is that Epson would produce a printer wider than their usual 44”. Epson is trying to go after the HP market which has the 60” HP 5500. Until now Epson used Roland, Mutoh, and Mimaki to go after the signage market (because Epson printers were too slow). But if Epson can speed up their piezo printheads, they could attempt to go after the sign market in 2007. The problem with a 60” Epson printer is that it will run head on into the new 60” Canon iPF9000 printer. No piezo printer can compete in speed with a thermal printer nowadays. So a 64” Epson, when it finally appeared (rumored for at least by SGIA and possibly by ISA and maybe even as early as PMA '07), was a good case of “too little, too late.” Because

as soon as HP released its 60" replacement for the venerable HP Designjet 5500, then Epson will have a second serious competitor with agile thermal printheads. The Epson 11880 faces the HP Z6100 and about four Canon wide-format printers. Ouch.

Special Epson models, Stylus Pro 4400, 7400, and 9400, were being test-marketed for CAD and GIS markets in most of the world except for America. These are similar to the 4800, 7800, and 9800 except the 4-series have dual CMYK to get around the lack of speed in the multi-color models. But getting rid of the multiple blacks and all the nice color seems to be regressing. They should do what HP and Canon are about to do, put dual sets of printheads in so you can have all the color, and dual-speed at the same time.

Epson came out with everything new that they had available already in 2005. All their main competition then had an open field during 2006 to unleash all the new thermal printhead advances (mainly speed). But Epson has a faithful following, sort of a phenomenon like Macintosh computers. Even if Dell PCs are faster there are still people who will buy only a Mac.

But the faith of the faithful will be tested to the limit by temptations from the alluring competition. Epson will need to increase their 3-blacks to 4-blacks (three blacks to a full quad black). Remember, matte black does not count because it is exchanged for photo black; it is one, or the other, not both. So the only printer with four blacks is the ColorSpan. Now that HP offers three blacks too, Epson is no longer holding any edge. All Epson can do with their 4880, 7880, 9880, and 11880 is pump the advertising and PR and use smoke and mirrors to address the faithful to convince them to update to the new Epson models rather than switching to HP and Canon.

Because Epson was overwhelmed by Canon and HP during 2006, Epson is the most likely to need to produce new and better printers during 2008. Their Epson 3800 was only a barely perceptible improvement. They will have to do better than this to win back serious professional production shops. But Epson will continue to do okay with individual photographers, individual artists, and people who are content with Epson the way they are now. The current Epson models are not bad (other than guzzling ink); they are simply no longer the cutting edge. Canon and HP are far ahead in innovative technology.

What Epson is attempting to do for 2008, is to come out with a 64" eco-solvent system that is of the same high quality as their water-based printers. But the eco-solvent market is new for Epson, and sign shop owners don't like snooty booths. Epson will have to change their philosophy completely if they wish sign shop franchise owners to pay attention to their new Epson printers.

Advances in Ink Chemistry

UV ink and solvent ink are where most advances will take place during 2008. In 2006 HP was able to evolve its previous dye ink (for the HP 30, HP 90, HP 130) into a pigmented ink for the Z2100 and Z3100. Dye ink, no matter how long its longevity rating is from Wilhelm, has immediate failure if dripped on by water. Epson retailers were using this issue with HP dye ink to push buyers to Epson pigmented ink printers.

The previous issue with most pigmented ink has been gloss differential or bronzing when printing on glossy media. Epson solved that in its R-series printer with a gloss optimizer. Now HP uses a similar concept with slightly different chemicals in the HP Z-series. Of course the real breakthrough will come when a printer can jet a liquid laminate which simultaneously eliminates gloss differential and provides added longevity. Gloss optimizers do not impart much or any additional longevity; they just make the print look pretty.

Since Canon and HP both introduced their new inks in 2006, until a jet-able liquid laminate can be perfected, don't expect major breakthroughs. Though, as mentioned in previous sections, it would be interesting if Epson can take its gloss optimizer upscale: it started out at desktop size and only slowly was put into slightly wider formats, but still all desktop size (which of course is the format that Epson excels in, for the individual user).

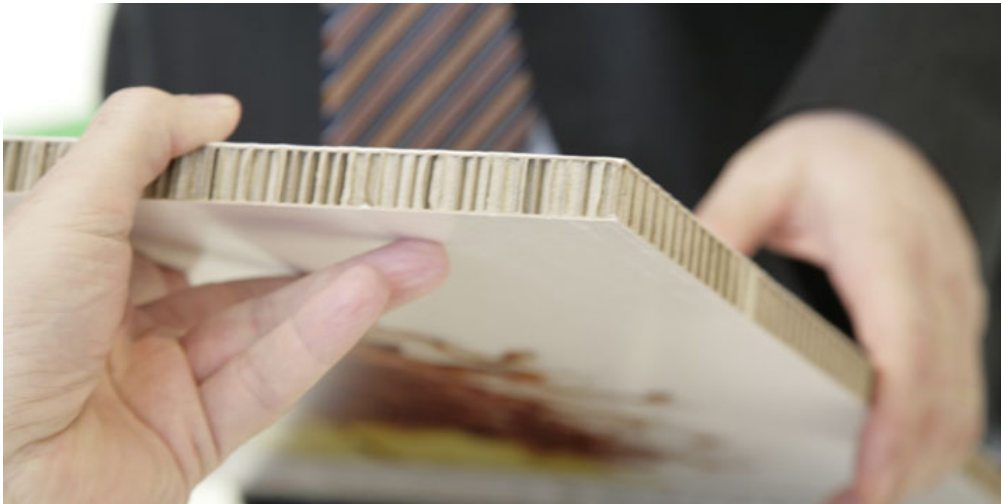
But if a laminate can be found that can be jetted from current printheads, it can potentially simultaneously provide gloss optimization (eliminate gloss differential on glossy media) and provide protection (both against light and scratches). Several companies told me at Sign Spain that they are either already working on jettable lamination or are thinking about doing this. So it would be a fair estimate to surmise that the big three manufacturers are also testing this technology.



Ink cartridges for the Epson Stylus 7600 at Print 05

Advances in Media & Substrates

The Chinese are dumping media in the US and this is causing two things: Swiss, German and US paper companies are dropping prices or going out of business. The result will be less investment in improving media: everything will go towards making the media cheaper. Not good, but that is what is happening. But chemists are working on improving media, so it will eventually get better, and less costly even from Switzerland or the US.



HP Scitex CORjet media at Fespa06



Inca UV-curable media

Advances in Software

RIP software tends to get more complex as the companies add more features. But color management gets easier as most manufacturers realize that the average user has no interest in doing custom ICC color profiles. ColorSpan had on-board color management in the last century, literally. And now HP has a more sophisticated solution. Color control with the Encad 1000i and Kodak 1200i were major issues, but these were primarily signage printers, and not intended for fine art or giclee, where color matching is more crucial.

One advance in RIP software has already happened, circa 2005-2006: namely variable data capability. Wasatch was among the first to offer this capability.



Advances in Printhead Technology: Page Arrays

We cover printhead technology in our treatise on piezo vs thermal printheads, in our Survival Series, on www.wide-format-printers.NET.

What will happen more often in 2008-2009 will be page arrays or at least cluster-arrays. The Agfa :Dotrix and Sun/Inca FastJet each use a page array. This means there are is a row of printheads all the way across the page (the row is usually staggered so there is overlap to cover up any lines that might develop between individual printheads).

A cluster-array is packing say four heads together to make more nozzles available per color. Durst Rho does this with Spectra nozzle plates.

For the HP 4000 HP simply puts two ordinary heads together; they are not yet even a cluster-array. Durst and Agfa already had what I call cluster-arrays as early as 2005. There will be more dual-head machines during 2007. Dual-printheads on thermal printers will increase the speed of thermal printers further past the slow crawl of piezo printheads. Some piezo printheads need 32 passes: that's back and forth, back and forth, many times. Agonizingly slow.

Inkjet presses are beginning to come out with page arrays; these inkjet production machines will eventually replace some offset presses. So it is only a matter of time before Canon, HP, and then a year or so later, Epson, have page-arrays in their high resolution wide-format inkjet printer technology. In a page-array the printheads are stationary; they don't have to move back and forth. A Roland takes 16 to 32 passes to create its fine quality; this is why piezo printers are slow (gorgeous output, but slow).

With a page-array of printheads there is no back-and-forth movement. The paper flows under the printhead at fast speeds. The reason these are not yet widely available is because you need multiple passes to create interweaving to cover up blocked or mis-directed nozzles. Otherwise you have defects or horizontal banding lines. But if you have multiple arrays, then you can have backup or replacement nozzles. And if the software can recognize defective nozzles a replacement nozzle can be used. HP and ColorSpan already have used this nozzle replacement technology for traditional back-and-forth printers for years.

Page-array inkjet printers do exist; these are actually printing presses. The Agfa :Dotrix is one example. FLAAR has been invited to the factory to inspect the million-dollar Sun FastJet; it has a page-array, and UV-curing ink technology. Of course the price tag and UV lamps rule this out for the photo lab for 2008, but there are Japanese firms that are already well along on page-array inkjet printhead technology for printers at more reasonable prices. So be alert to more notices on this exciting page-array technology. The place to see them all will be DRUPA 2008: the largest trade show in the world. Last time (held every four years, so 2004) we stated there 10 days.

Advances in Printhead Technology: General Observations

Five years ago sales reps sang the song of piezo superiority. Year 2006 revealed how much life is left in thermal printheads. Lexmark is, so far, the only thermal head that is uninspiring. Encad and Kodak have, in the past, had access only to the Lexmark head. The "Brother" piezo head Encad and Kodak tried to use in their ill-fated 6250 printer failed to function adequately.

So even if thermal printheads eventually reach the end of their technology promise, and even if 20 years

from now piezo heads are still advancing, none of that will benefit print shop owners today. Today, 2007, thermal printheads will showcase how many surprises still remain. The printhead on the HP 8750 and the printhead on the HP 130, offer spectacular quality, as but one example and that was already a year ago.

Spectra and Xaar printheads are gradually getting smaller picoliter drop sizes. Canon is already down to 1 pL in desktop size and 2 pL in other desktop units. HP and Epson are about 4 pL or less. Encad is still stuck with Lexmark printheads that have about 10 or 11 pL. Spectra heads are about 30 pL; the older heads are 80 pL. But generally expect to see higher quality from UV and solvent ink printers, especially in whatever HP produces together with its new partner, Seiko.

For 2007 the first hints of MEMS technology and page array alignment of heads will be talked about even more than it is now.

How to measure Image Quality

In 2003 you could tell which prints were from an inkjet process: banding, grainy dot pattern, and differential gloss revealed that it was “an inkjet print, not a darkroom photograph.”

By 2004, the most recent models from Canon (6200, 8200), HP (30, 130), and Epson (4000, R800) had gotten rid of much of their visibly distracting dot pattern. Hopefully they have minimized banding. The only remaining feature that alerts a cognoscenti that it’s an inkjet print is differential gloss reflection pattern on pigmented ink with glossy media. Here is where HP’s move to a long-life dye ink helps: less gloss differential. Besides, most pigmented inks don’t print well on glossy paper anyway. Or if they do print they get quickly and easily damaged in handling.

For 2006 print quality advanced still further, though the dot pattern was still a painful issue with the early version of the Canon iPF printers. Now that these printers are maturing, now (2008) is a time to compare them in more detail.



HP Designjet 130 at Sign Madrid 06

What Printers would FLAAR Like to Have?

Our dream printer would be

- with 12 ink channels
- but with a RIP such as Evolution RIP that can actually handle all the colors.
- For some applications a better saturated ink gamut would be useful.
- And a camera-to-finishing workflow
 - A digitization system of paintings for giclee that fed directly into the printer's profiles, comparable to what HP showed at ArtExpo two years ago already.
- A post-printing top-coating system (giclee on canvas has to be top coated)

Any photo-quality printer that can avoid differential gloss defect (bronzing is its most serious manifestation) will win our vote.

A glossy media for pigmented ink that did not scratch and self-destruct from normal usage would be a pleasant surprise. You can't use glossy media with the Encad, Kodak, or Xerox versions of the Encad 1000i; they are very honest about warning you.

You can't use glossy media with the Canon w8200 either; it scratches too easily; it is blemished even coming through the printer itself. We do not know if the Canon w6400 or Canon w8400 can handle glossy media because they were not sent to us for testing. But most printers with most pigmented ink can't print on glossy media: it is the same with Epson printers, though this issue may have been resolved recently. The question is not so much whether it can print on glossy materials as to whether the glossy print will survive even being rolled up without being scratched.

A dye ink that did not self-destruct in humid weather would be a welcome change. In high humidity dye ink turns back into a semi-liquid and "runs" inside the material it was originally printed on. It ends up looking slightly smeared, or out of focus, or faded.

A printer that is not designed to waste ink and media would be a nice gesture from printer manufacturers. Most printers, especially Epson and ColorSpan, waste too much media when doing test prints. Epson wastes by cleaning its clogged nozzles: they should concentrate on designing a printhead that does not clog to begin with.

Plus, if you read our reports, you know we will give a well-deserved blessing to any printer that can produce consistently with no banding defects and no roller-marks (media feeder scratch marks).

The Mimaki JV22-160 and the Roland (ErgoSoft) d'Vinci were two remarkable printers we were following with interest. We do not yet have either so can't recommend them from personal use. But neither will be commercially successful since both Canon and HP now offer 12-channel ink systems.

Our really favorite printers are the Agfa :Dotrix and the Noritsu Mytis. Unfortunately the media for the Mytis is simply too expensive. Plus everyone is moving to solvent or UV ink for POP signage.

Outside of inkjet printers, we also like the Xerox iGen3, Xeikon 5000, and HP Indigo. Although these are not inkjet technology, many of our readers ask us to help them decide which brand variable data press to buy. However we could not help notice a new website of a print shop owner that reports all his headaches with the HP Indigo technology. Xerox brought five of us to their manufacturing plant in Rochester, and after seeing that it would be a natural decision to opt for the iGen3.

Xerox has impressive technical capabilities. Xerox understands a university and the benefits a university can have in evaluating equipment. Xerox showed us that they can produce a variable data system that does not have the glitches and issues and drawbacks that other systems do.

Until we get our Dream Printer, what do we actually use?

The HP 5000 and 5500 are our main production workhorses. We use them for pigmented ink. FLAAR has a full-scale print shop at the university. This way our tests are realistic. We also do lab-type testing, but we prefer the real-life usage evaluation best.

We thought about switching some jobs over to the Canon 8200 since it has the same visual quality as the Epson 7600, 9600, 10600 and the Canon ink and media cost less. And the Canon is appreciably faster. But the Epson R2400, Epson 4800, and P-4000 digital photo viewer are products that everyone will desire. Epson does a better job of marketing to individuals and to the SOHO market. We had trouble getting our main RIP to work with the Canon too. The Canon-provided RIP software was really not that different than a printer driver. And as we mentioned earlier, glossy paper did not work at all in the Canon: it scratched going through the printer. The fragile surface of the media simply did not hold up. So we went back to using the HP and Epson printers.

Since we can see through inflated marketing claims we tend to use printers that are more practical and cost effective. HP has a wider range of media and is a real workhorse for the university. Even though we have 27 printers available, the majority of our signage and general printing, including giclee on canvas and watercolor paper, is produced by the HP 5000 and HP 5500 (we have three of them actually). But for photographs, here is where the HP 130 and Epson 4000 have the quality. During 2006 we added an Epson 7800 since most of our readers want to know our experiences with these printers. Since FLAAR is considering moving to a new university, we have not recently requested printers for evaluation; we prefer to wait until we are in new facilities (the building we occupied at BGSU was torn down last summer; but as you can see. FLAAR is doing just fine, in part because we are independent of the university). After the university tore the building down, FLAAR simply moved its office back to Guatemala where we now have a staff of 17. With Skype, Vonage, etc, we can operate from anywhere in the world. FLAAR will open an office in Europe later in 2008 as well.

If you need to buy a printer now, and just can't wait, then look at our website. We have reviews for everyone, at every level. All FLAAR reports can be accessed on www.wide-format-printers.NET. Sometimes our catalogs get behind; but the website has all the latest updates even if the preview PDFs are a few months behind.

As a courtesy, FLAAR has a policy of not releasing specific information on printers prior to the actual company first showing the printer. But as you expect, we know about the printers anyway, even down to their new model designation. But this report, to be fair, and to be ethical, does not use privileged information. Instead this report is based on inherent intuition, so that you too can learn the process of estimating what printers are about to be released. Actually they are shown to many people before the first trade show, so the details become known rather quickly. As soon as a printer is spoken about openly at a trade show, even if not presented in physical presence, it is fair to comment on it. At Graphics of the Americas (early in 2008) there will be an abundance of fresh information readily available all over the floor. We include in this report only the aspects that were openly discussed beforehand.

A Mature Printer may be an advantage over the newest Prototype (that may not work)

If my company depended on a single printer for my success, I would rather depend on a printer with proven technology in a mature product (HP 5000, HP 5500, HP 130, or Mimaki JV4) than risk my survival on fancy advertising claims for a printer that no one knows how long it will hold up, or what its quirks may be.

Three years ago Contax claimed to have produced a full-frame CCD digital camera. They offered them for sale even.

But the camera actually never functioned. Pentax had already cancelled their attempt with the same sensor chip a few months before. But Contax paid no heed and produced years of loud advertising claims, and, after painful delay, a sort of too-little, too-late camera, that won the lowest rating that a French review panel had available on its charts. But before people found out the truth, lots of people got squewered by the misleading advertising. It is also worth mentioning that after the French review, Contax allegedly refused to provide any cameras to astute reviewers in the US.

So if a printer manufacturer knows their printer will work well enough to convince the professors and graduate students who will examine it at our university, then these tend to be the brands we ask for or are offered.

You don't see printer manufacturers offering us printers that they themselves know won't pass our scrutiny. We asked one manufacturer why they had not previously provided their earlier model. They answered, "Nicholas we read your reviews. We noticed you had already learned the weak points of that printer model. We thus saw no sense in giving you this printer; you merely would have found the features that did not work well. So we waited until we redesigned a totally new printer. Now we believe our improved printer will meet your standards."

We subsequently received two different models from this company. Our graduate students scrutinized them; both printers did well in the lab inspection.

So now you know our secret: we have primarily the printers that we already know are the best. We have the time, the resources, and the knowledge to pick the best printers. We have over 43,000 e-mails from end users, so we get tips from all around the world.

So you might like to benefit from this situation. Look at what printers FLAAR uses, and note what printers we don't have.

So beware of a printer that is "too good to believe." You may find out that an advantage of a mature product today is that the newest splash of tomorrow may be a dud. The CrystalJet printer was a monumental failure, as was the Kodak 5260. Yet hundreds and hundreds and hundreds of sign shops, repro shops, and photo labs actually ordered these printers. The manufacturers even sold these models, even when they did not physically function and/or could not be manufactured to perform to spec. Obviously (we assume) that all monies were returned to the sign shop owners who bought them prematurely, but what about all the business plans that collapsed because the promised product never materialized?

We hope that you have enjoyed not only the vision of what was produced in 2004, but more useful for the long run, how you yourself can predict what new printers may appear in 2006 and which companies are likely to produce each new class of printer.

HP is the most overdue to produce a breakthrough at 60" size. Canon has immense technological capabilities and an impressive portfolio of printhead patents: but their sales plan is patterned after selling Canon copiers and Canon cameras. This business model has not been productive for selling wide format inkjet printers. Otherwise until a new printhead from Konica or elsewhere can match the quality of Epson and surpass it in speed, the printer manufacturers to watch in 2007 are Epson, with the possibility of a surprise from Kodak (hopefully something more than their desktop printer with cheap ink). Agfa and Fuji have relegated themselves to selling re-branded products from Epson; Xerox sells relabeled Encad printers.

And more importantly, this FLAAR report points out the benefit of a mature product, especially a product that has survived testing and evaluation in the FLAAR facilities. The printer you are looking for in 2007 may already have been introduced in 2004 or even before.

In-line Lamination

Four years ago there was an attempt to create in-line lamination in a water-based printer. The process failed and the product was never officially announced. I am under NDA as to which company and which product was involved.

Now there is another in-line lamination system that works better (from a completely different company). I inspected it during 2007.

Few inkjet printer manufacturers are brave enough to admit that their output needs lamination. And even fewer manufacturers are daring enough to accomplish the R&D to create an printshop sized printer that has functional in-line lamination (and at under \$30,000 for the printer+laminator).

What to Expect in 2008 Summary for Water-Based Inkjet Printers

Over the last several years Canon has invested about a billion dollars to develop new printheads and new printers to handle 12 ink channels. They have launched their iPF series in various sizes.

HP has also invested over a billion dollars to improve its inks, color management within the printer itself, and also 12 ink channels. The Z2100 series have 8 channels; the HP Z3100 has 12 ink channels.

This leaves Epson with half the power. For years Epson was the leader in giclee, fine art photography, and proofing. Now there is serious competition from two giant printer companies. So obviously for 2007 Epson will need to launch better, faster, and more versatile printers.

If you are a museum, a photographer, an artist, 2008 is a great year because the quality of inkjet printers is significantly improved. But if you are a sign printer, you will unlikely be ordering a water-based printer in 2008. The only thing which could change this would be if the replacement for the venerable HP 5500 is three times as fast as the Canon iPF9000. The HP Z-series, so far, are slow (indeed about as slow as an Epson 9800 according to an Epson dealer who knows all three brands: Canon, Epson, and HP).

So until water-based printers become as fast as an offset press, the trend for sign printing will be to mild-solvent and UV-cured ink printers. In five years these will offer quality as good enough for reproducing photographs and fine art giclee. Décor is already printed with solvent ink; décor is low-priced giclee. Décor is the reproduction

of paintings, the kind of decoration that decorates motels, hotels, casinos, and cruise ships.

For purely water-based printing, the remaining markets are CAD, GIS, trade-show displays, photos, décor, giclee, and temporary indoor signage. These water-based markets are not as dead as solvent printer manufacturers would like to think. Actually it is ink price and the cost for coated inkjet-compatible media that makes water-based printers an issue. Solvent materials and solvent inks are so much cheaper (but the initial investment in the printer is twice or three-times that of a water-based machine).

Plus the health issues; at FLAAR we have received 27 water-based printers for evaluation, but so far no solvent-based printer, though we are moving more into solvent-based evaluations since we have a keen interest in helping National Parks and archaeological parks improve their signage. Over the Dec 06-Jan 07 holiday weeks FLAAR undertook a survey of signage at several national parks in Guatemala. We also studied educational signage in museums exhibits in Guatemala. FLAAR looks forward to contributing expertise to improve these applications.

Where will all this take place in 2008?

All the new printers have actually already been presented, under wraps. But with NDA (non-disclosure agreements), no one is allowed to mention them by model number, and no one is allowed to list their spec sheets, nor even their brand name.

So how do we know all about them already? Because, well, we need to be well-informed so we can assist our readers. But you will notice, we never try to scoop any official release. We politely wait until the manufacturers issue their own notices. Only then do we mention all the details. Except, except when the trade magazines pre-release the information anyway, or if so many people discuss the details openly that it is long ago public knowledge.

At Graphics of the Americas trade show, most of the new information will be so widely discussed as to become, in effect, public knowledge. But at most only one or two new printers will be released at GoA '08 in Miami. The heavy artillery will be saved for ISA, a month or so later. Then comes FESPA Digital in Geneva, and DRUPA in Germany: lots of new printers there, though mainly UV and solvent.

There has never been a year in the history of inkjet printing like 2006, especially with the final decline of Encad. Encad started the 4-color inkjet era, and along with ColorSpan, got wide format inkjet for color signage started as a business. We hope that no other company sinks in 2008.

The main new technology for 2008 will be in UV-curing printers, so be sure to check out our over 83 FLAAR Reports on UV-curing wide format inkjet printers, on www.wide-format-printers.NET, in the links at the right. The other advances will be in LED lamps for UV curing. Otherwise, the most surprises will be in inks that are not UV and not traditional solvent. Staedtler's Lumocolor ink is sort of the direction that we mean, but it will be different companies and different chemistries for 2008. But Lumocolor was a good start; there is a separate FLAAR Report on this innovative ink.

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