

Wide-Format Inkjet Printers at PRINT 09



What to Expect in 2009
Based on wide-format Printers
At GRAPH EXPO 2008



Contents

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Introduction

GRAPH EXPO is held every year in the autumn at McCormick center, overlooking Lake Michigan in Chicago. It's a gorgeous view of the lake from the fourth floor, and overall a beautiful convention center.

Every fourth year GRAPH EXPO becomes a special larger international event called PRINT – 2009 is a PRINT year. The show will occupy the North and South halls in McCormick Place; the Wide Format Pavilion will be in the South Hall. Show organizers have planned many special events including a free hands-on vehicle, window and wall graphic application workshop in the Wide Format Pavilion called **Rap City**.

UV-curable wide-format inkjet printers at GRAPH EXPO 2008

The Agfa:Anapurna M4F is a special version of the Dilli Neo Titan that is made for Agfa in Korea. Dilli is one of the better manufacturers in Korea.

The Agfa: Anapurna XLS (shown at the 2008 event) is the rebirth of the original Anapurna 100 that was manufactured by Mutoh in 2005. That relationship ended over two years ago and that printer was cancelled. Mutoh is now trying to make their own UV hybrid. Agfa is now making it's own combo printer based on resurrecting the best features of the Anapurna 100 and improving the features that did not work on the Mutoh version. But in the meantime, the most popular of the Agfa line are the "M" series. You can see these in 2009 at the PRISCO booth (#4404), in the PackPrint area at the front of the South Hall.



Agfa Anapurna XLS UV printer front view.

FujiFilm/Sericol Their booth last year exhibited Inca printers. Inca has made only dedicated flatbed printers from the beginning: no combo style (transport belt); no hybrid printers (pinch rollers on grit rollers to move materials, with roll-up tables to handle flat and rigid materials).

But now the owner of Inca Digital ((Dainippon) Screen) is making a combo-style printer using the ink system of the Inca flatbeds. So there are still marketing people who believe they can design and construct a combo style system that works. Of course Durst is the best example of a company that has been successful with a combo style system.

Gandinnovations GandInnovations will be in booth # 4855, a 20' x 40' space just outside of the Wide Format Pavilion.

Gerber Gerber showed two of their popular Solara ion UV flatbed printers with its on-board roll-to-roll option last year. This cationic UV-curable ink printer has functioned much better since September 2008. To make sure that it works outside a trade show booth I visited a printshop in Chicago last year. The owners were content and said “we got what we paid for.”

HP The HP booth needs lots of space so it is far away from the Wide Format Pavilion.

Mimaki Last year Mimaki showed several of their UV printers including their new roll-fed hybrid that uses LED curing lamps. Every few months the LED lamps and the UV ink from 3M get a bit better. So today the ink is better cured today than it was at DRUPA in June, but at VISCOM Germany and VISCOM Italy (two months after Graph Expo) the ink was still noticeably tacky (not fully cured).

For 2009 Mimaki should have its newer X-version of their dedicated flatbed. The previous model for three years, JF-1631 series, had many minor issues, and is gradually being retired from the marketplace. The newer model will hopefully get rid of the earlier issues and provide a better and more reliable solution that is what end-users expect from a Japanese engineering technology company.

Oce Arizona 350 / FujiFilm Acuity Océ exhibited their new flatbed that is less slow and adds white ink to the former successful Arizona 250 GT. Fujifilm sells the absolutely identical printer under the Fuji brand name (only difference is a different exterior color).



Océ Arizona 350GT printer.

Raster Printers is now EFI Rastek Raster Printers was purchased by EFI and began to exhibit in the EFI booth already at DRUPA 2008. By the time of GraphExpo Rastek was a bit more integrated with EFI, though the official acquisition date was in December 2008.

Rastek exhibited their T-600 UV printer, the nice flatbed with very high quality for small fonts. Since Spectra M Class heads will no longer be manufactured (due to reasons that I detail in the FLAAR Reports on printheads for UV printers). The new version is called Rastek T-660. Rastex is expected to be in the EFI booth at PRINT 09 (Booth # 2500 at the front of the South Hall).



Rastek T-600 UV printer.

Screen (Dainippon Screen) Last year Screen exhibited its Truepress Jet2500UV. This is a well designed system that takes some features from the Inca flatbed (such as the Inca ink tanks) and adds them to a combo system (meaning with a rolling belt). Durst is the most successful company with the combo design.

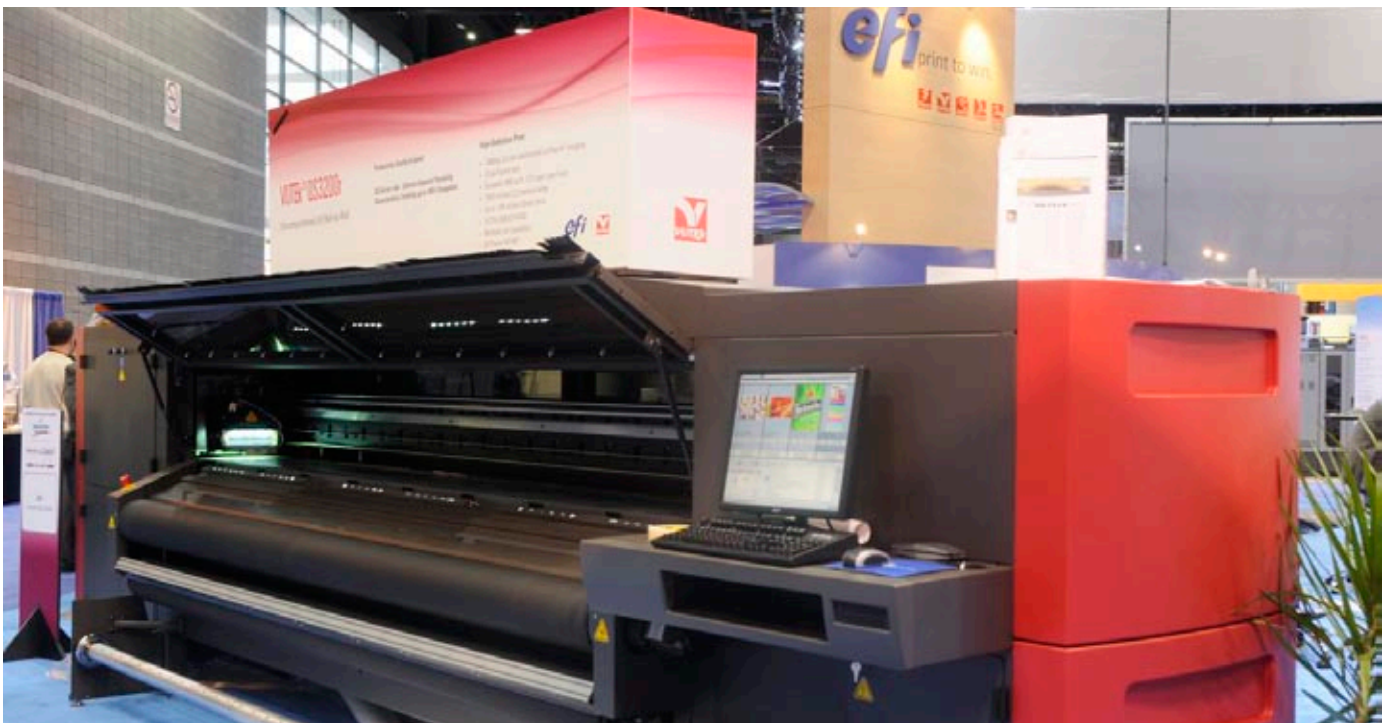
Although Screen makes a nice UV printer, the Durst Rho outsells them many to one. I have been at the Durst factory three times already in 2008 and can testify as to the engineering capability of Durst. I have not been at the Screen factory in Kyoto, Japan.

VUTEK QS 2000 and QS 3200 VUTEK has made only combo-style UV printers from the beginning: no dedicated flatbed and no dedicated roll-fed UV. This is unusual, since even Durst has branched out into roll-fed printers. But VUTEK saw everyone else being successful with roll-to-roll and so they offered their QS3200r.

For PRINT 09 VUTEK will have its newer GS series of UV-cured printers.



Vutek QS-3200 UV printer front view at Efi booth.



Vutek QS-3200r UV printer front view at Efi booth.

Some of the Major US Distributors

Several manufacturers of UV printers who hire FLAAR as a consultant ask us to suggest and then recommend distributors to contact to consider selling their new brands of UV printers in the US, Canada, and Latin America. So gradually the FLAAR Reports are adding lists of distributors to our trade show reports. This list is in the TRENDS version of the report.

Most FLAAR trade show reports are issued in two versions: a free version as a courtesy to our readers who are students and professors, and a for-pay version on our e-commerce site, www.wide-format-printers.NET, in the link to UV at the column at the right. The for-pay version is to help FLAAR raise funds to keep offering valuable insights on trends that a manufacturer, distributor, and reseller needs to keep informed.

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Most recent UV Printers



UV Lamp Manufacturers

FESPA '07 and especially DRUPA '08 had the best range of exhibitors of UV lamp manufacturers. At GRAPH EXPO there was only Heraeus Noblelight, which is used in other industries, but not by more than perhaps 1% of the UV-cured inkjet printers.

Nordson makes UV lamps but Dr. Honle, Phoseon, and Integration Technology have about 90% of the market for inkjet use of UV-curing lamps.

Cutters for thick rigid materials

With so many printers that can image onto thick and rigid materials every printshop now needs a sophisticated flatbed cutter. So manufacturing and selling cutters is big-business. Zund and Kongsberg dominate the market; iCut software is the other dominant company. Dominance, especially in software, does not always mean absolutely the best, but obviously any #1 brand is hardly defective or deficient.

Flatbed cutters are an accessory for what's called "finishing." Lamination and trimming are also part of finishing.

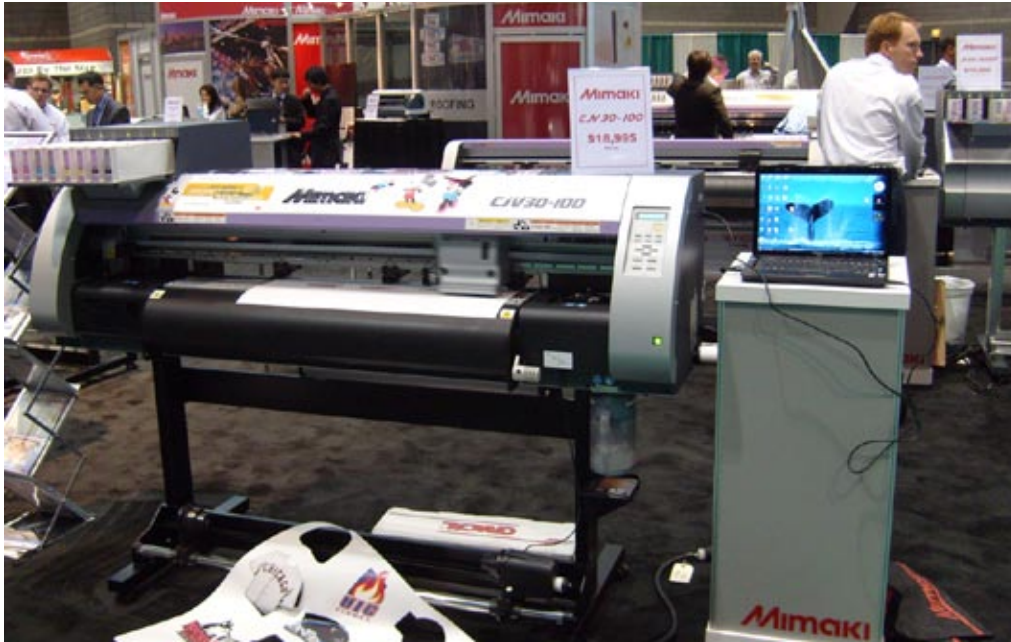
Although there are industry specialists in helping people learn about laminating, I don't yet know any independent world expert in flatbed cutting. I am definitely not that person, however I have a personal and professional interest in learning because flatbed cutters are ideal to make museum displays. Indeed FLAAR current has a project with XY flatbed companies on this aspect, and two separate reports on the first stages: one report on

Gerber cutter Last year Gerber purchased a company that made cutters. The question has been raised, however, how precise these cutters really are when compared with a European-made cutter or CNC router. I shudder to think of what it would cost to do detailed comparative tests to evaluate such a statement. Sometimes people just repeat what someone else said about a product. Often the error is lack of experience or training in using a product. We consider all products innocent until proven guilty in a site-visit case study, but at least it's good to ask questions and do your own tests.



Nicholas Hellmuth holding samples cut by the Gerber cutter M Serie, at GRAPH EXPO 2008.

Mimaki cutter Mimaki is a respected engineering company but every time I ask print shop owners about cutters, they don't include Mimaki in their short list. They don't say its bad, they just consider it entry-level.



Mimaki CJV30-100 printer cutter at GRAPH EXPO 2008.

Zund Buying a Zund cutter is sort of like buying an IBM computer in the old days; you can't go wrong buying an IBM (of course now the IBM consumer computers are made in China... things do change, but so is the Mac Titanium 17" laptop that this FLAAR Report is being typed on). The Zund cutters are definitely not made in China.

I have seen how carefully the Zund cutters are engineered in the factory where they are assembled. I have also visited the adjacent factory where the parts are made for cutters and Zund UV printers. It's kind of obvious that Zund has decades of experience. However I recently visited a printshop in Europe that was not satisfied with their Zund cutter because it was too lightweight to actually cut the kinds of thick material you can print with a VUTEK combo flatbed printer. This was a Zund model about three years old (so not their current improved model). So be careful if someone offers you a used model of an older series.

Kongsberg Many printshop owners prefer Kongsberg (if they want a high-end cutter). But one major multi-national printing shop said they could not establish a communicative relationship so they bought another brand.

Solvent Printers at GRAPH EXPO 2008 (and hence at PRINT 09)

Students seeking co-op positions in most printshops, including screen printing companies, will quickly be faced with solvent inkjet printers. Students graduating and seeking jobs in print management will have their success tested with how they can understand the difference between diverse kinds of solvent ink.

Nonetheless, there are not many alternatives to solvent printing in most cases (UV-cured ink is not exactly benign either; one ink chemist said he felt that UV ink was more dangerous for your health than solvent ink, just that the UV curing chemical issues were not yet fully known on human health).

Most printer trade shows include several kinds of solvent ink:

Mutoh exhibited primarily solvent-ink printers; they are not yet showing a UV-cured printer in the US (they show their Zephyr primarily in Europe). Mutoh and Seiko are the most out of synch with the market demand for UV printers.

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Mimaki had a best-seller in their JV3 solvent printer, but its very slow. As Mutoh and Roland came out with faster models, Mimaki tried to counter with their JV5. This went through a long long gestation period and quickly got a reputation for inability to dry the ink at its printing speeds.



Mutoh VJ 1608 Eco solvent printing some samples.



Mutoh VJ 1304-54 Eco solvent printing some samples.

Now Mimaki has come up with two other printers, their JV33, in 1.3 meter and 1.6 meter versions. But these also have ink drying issues, so much that they have to be run at uni-directional mode (which cuts the speed down in half). The colors, however, are very vibrant, indeed remind me of the Seiko ColorPainter 64S (now the HP 9000s, but with a reformulated ink).

FujiFilm bought Sericol ink company. Sericol is the distributor of Inca Spyder and Inca Columbia printers.

FujiFilm/Sericol now is trying to offer aftermarket ink solutions for solvent as well as UV printers. So Sericol re-brands Mutoh printers and gives them new names (that few people can remember).

Xerox rebrands the same Mutoh Europe solvent printers as Océ; Mutoh sells the same printers also. Often a printshop will prefer one distributor over another and buy more because of the distributor than the actual product. Since Xerox has access to thousands of Fortune 500 companies who use Xerox copiers, Xerox can sell these same companies an eco-solvent printer.

So can Océ to their clients who are the Fortune 500 companies that are not buying Xerox or Canon copiers.

The Xerox solvent printer models in past years were the Xerox 8265 and Xerox 8290.

Ventilation of Solvent fumes & other issues

Most manufacturers of eco-solvent printers claim no ventilation is needed.

Many manufacturers of UV-curing wide-format printers claim that no ventilation is needed.

Neither of these claims is true: eco-solvent fumes are enough to cause workers in the same room to complain. Mild-solvent is worse. Most UV-curing flatbed printers create an odor that is unbearable for normal office workers (other than for the printer operator who gets used to the smell quickly, and has no other alternative anyway).

But if you are a student that is hired at a printshop, be aware of these issues. Of course screen printing ink is the most hazardous of all, but lobbying and other pressures has kept this issue under wraps.

Two companies in North America (both in Canada actually) are addressing the ventilation issues: PAT and ICA.

PAT Technology Systems emphasizes capturing as many of the fumes at the source as possible. Their ventilators are hooked to the front of the printer. PAT disappeared, sort of, and part of its product line was bought by Purex North America. You can see their equipment in Mimaki's booth, #4869, in the Wide Format Pavillion.

ICA systems emphasize cleaning the air in the entire room, since they indicate that much of the offensive VOCs and unbearable odor of solvent ink is out-gassing after the print is moved away from the printer. So a printer-ventilation only captures the first part of the unhealthy odor.

PAT offered custom systems for Mimaki JV3 and Mimaki JV5, for Roland Advanced Jet AJ-740 and other printers. PAT was recently sold. Although the new company does not have a booth, their managers came to the FLAAR booth to say hello.



ICA showed three of their filtration systems, the Duster-1000, Duster-2000 and the Duster-3000.

Water-Based Printers

Epson, HP, and Canon all exhibited water-based printers. Mimaki, Mutoh, and Roland still conceivably have water-based printers available on special order, but for years they have not exhibited them, and when so, primarily for textile inks or dye-sublimation inks. The market has clearly moved away from water-based to eco-solvent and mild-solvent inks.

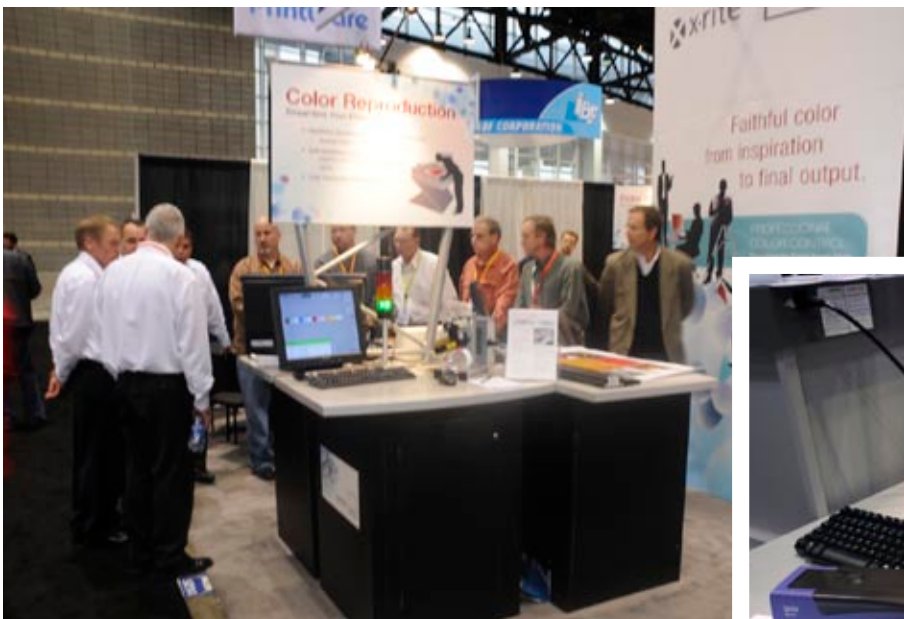
There were two booths that exhibited various iterations of double-sided proofing printers. These were two separate printers with one raised above the other on rails so that the image would be printed on both sides.

The Canon booth in past years was primarily copiers for printer shows, or cameras for camera shows. Printers were (in the past) relegated to a side area and not emphasized. Gradually, and especially since Canon invested over 1 billion dollars in creating new thermal Bubblejet printhead technology, Canon is allowing more space in its booths for their wide-format printers.

We do not have any recent brand Canon or Epson printers so FLAAR is concentrating on textile printers and UV-curable flatbed and roll-to-roll production printers. These we can inspect in the factory (so we can see inside to make sure they are well constructed). Then we can test them in the demo room (away from the hectic of a trade show).

RIP Software and Color Management

PRINT 09 is a good place to go to learn about proofing RIPs. Since color management software and tools is a monopoly controlled by X-Rite, there is not as much action in this area as when GretagMacbeth was an independent competitor. Now X-Rite owns even Pantone. So prices will rise and innovation will slow down a bit, but currently color management is at a good level anyway.



X-rite booth at GRAPH EXPO 2008.



Fortunately there is still one independent manufacturer of color management spectrophotometers, BARBIERI electronic. One of their precision instruments was in the booth of VUTEK, if I remember correctly.

Color Burst is a RIP used for many years on VUTEk and recently by Epson.

EFI makes RIPs both for copiers and for wide-format inkjet printers. EFI owns VUTEk and is an investor in Raster-Printers too.

GMG is a German proofing RIP company. They inherited many of the best staff of BEST RIP when that German company was bought by EFI.

ORIS is a German proofing RIP from CGS in the US.

Several color management consultants had booths at GraphExpo.

Eizo Nanao Technologies Inc, offers LCD monitors that can be color balanced.



EIZO exhibited some of their acquisitions used for color management at their booth.

Lamination (in 2008)

- D&K Group Inc
- GBC
- Drytac, booth 5240.
- Royal Sovereign International

Variable Data Short-Run Digital Presses

Students who learn about variable data short-run digital presses while they are still in the university will have an excellent chance of obtaining a well-paying job when they graduate; especially if the student learns the necessary software.

In the beginning, the primary short-run digital presses were the

- Indigo (subsequently bought by HP)
- NexPress (purchased by Kodak from Heidelberg)
- Xerox iGen3 (now iGen4)
- Xeikon

Now other companies, that missed out in the first era, are trying to turn their copiers into variable data short-run digital presses, especially Canon and Océ. Dainippon Screen is another company that has been working on an inkjet-based short-run digital press, their TruePress Jet520. However this is evidently still in beta stage, even though it has been exhibited previously and was prominently displayed.

The quality has improved dramatically in past years. At Print '01 the output from the Xeikon was not much better than an average copier. Today it's photo-realistic and one of my favorites.

Reliability has also improved. The original Indigo printers had endless issues and quirks. You had to buy two Indigo printers in the beginning because one would always break down. Today the HP Indigo is significantly better, albeit all complex technologies require a fair amount of tech support and maintenance. I still hear owners complaining about their Indigo printers. In general, I find the Xerox iGen system more interesting. I have spent an entire day at their impressive factory in Rochester so got to see the iGen inside out.

All four original leaders: Indigo, NexPress, iGen3 and Xeikon, are now all mature technologies. This is both positive (they finally work and are predictable) and negative (other newer technologies could surpass them). But for today and tomorrow, the four original short-run digital presses are the most investments that will produce the fewest unpleasant or unexpected surprises. Maturity has many definite advantages.

If an angel appeared and asked me which short-run digital press I would prefer, and told me it would be delivered at no cost, I would select the iGen4 with all accessories (cutter, binder, etc).

If I wanted a digital press only for printing photographs, I would be tempted by the Xeikon since it is the only one that can print panoramic photos or circumferential rollout photos (because Xeikon prints much longer sheets than any of the other brands page size).

Scanners

Most wide-format printer trade shows lack any display of input: the trade shows are all about output. So it is nice to see a scanner company, in this case Contex, sold via Vidar. Their version of the Contex scanner is one of the few flatbed scanners still being manufactured. Others would be entry-level Microtek and Epson and high-end Kodak (CreoScitex).

University Booths

Since BGSU ran out of money for a digital imaging program long ago, and tore down the building on campus two years ago that houses the FLAAR facilities. Plus that university did not demonstrate ability to send their own staff to participate in trade shows. Nonetheless, FLAAR continued to exhibit on its own. We have expanded our staff to 19 and have grown larger than when we were on the campus.

The corporate office of FLAAR (USA) is in St Louis, Missouri. The main office for the five web designers, the four graphic designers, several photographers, managers, and support staff has always been in Guatemala (FLAAR has had an office here for over 30 years, long before Encad began making inkjet printers).

PRINT 09 offers a new service, "Education Main Street," both for students, and for employers looking for fresh graduate students. Here, representatives from colleges, universities and educational organizations will provide information on curriculum offerings, scholarships, and students seeking internships.



FLAAR had a booth at which Dr. Nicholas Hellmuth interacted with the persons who visited our booth.

Education Main Street Exhibitors:

- Accreditation/Certification (PrintED and AC-CGC)
- Cal Poly
- Chowan University
- Clemson University
- College of DuPage
- Eastern Illinois University
- Scholarship: EDSF and PGSF
- Ferris State University
- Fox Valley Technical College
- GAERF 2009 National Student Design Competition
- Georgia Southern University
- Harper College
- International Graphic Arts Education Association
- Kennedy-King College
- University of Wisconsin-Stout
- Vincennes University

LECTURE PROGRAMS

FLAAR was active in the main lecture program. It was well attended by printshop owners, managers, and printer manufacturer managers. Dr. Nicholas Hellmuth will speak at PRINT 09 on September 14th on new trends, new inkjet inks and comparable topics.



At GRAPH EXPO 2008 Dr. Nicholas Hellmuth gave a lecture about New Dimensions in Flatbed Solvent and UV Inkjet Printing, at which a lot of people attended.



He discussed about the difference between UV and Solvent large format printers, also talked about hybrid flatbed solvent printers and ink costs.

Conclusion

GRAPH EXPO is more like IPEX in that it includes every kind of printing machine. Every four years GRAPH EXPO has a special event that is like a mini-DRUPA for the USA.

SGIA and ISA are primarily wide-format inkjet printers, though SGIA still exhibits screen printers (the “S” in the name SGIA used to mean Screen Graphics International Association, or something similar).

At GRAPH EXPO 2008, every booth manager I spoke with said that in the first two days they had better traffic and more solid leads than at all four days of SGIA just a few weeks previously.

The reason for poor attendance at SGIA was the show location: Atlanta. Atlanta has a high crime rate, has a dull downtown area, and is not very exciting compared with Chicago. Chicago is obviously not Las Vegas, but Chicago is a vibrant exciting city compared with Atlanta.

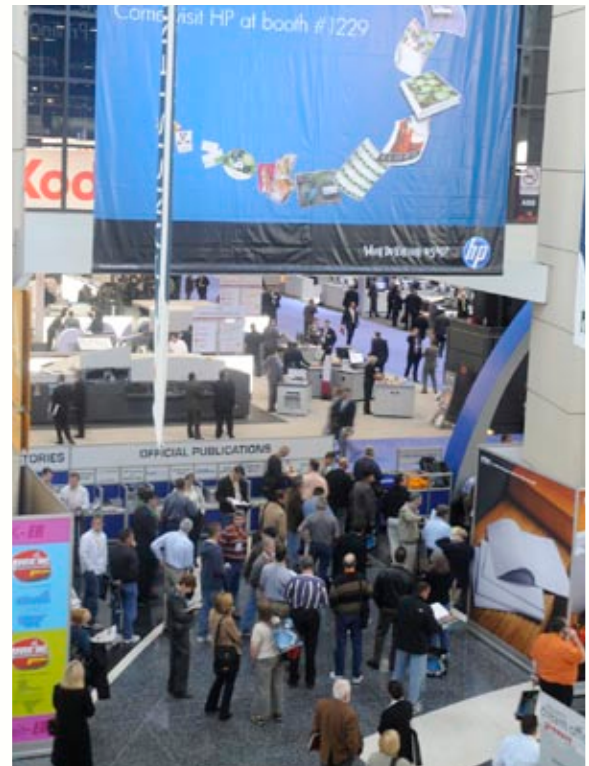
The main advantage of Atlanta is its large airport and not many unions at the trade show center.

SGIA has a tradition of picking unusual locations, such as Minneapolis and St Louis. I live in St Louis and can document that its downtown is comparable to Atlanta (a bit dull) and at night also has a notable crime rate too.

For 2009, Print '09 (the 2009 version of GRAPH EXPO) will be almost twice the size of 2008, and will be separated from SGIA by almost two months. All these factors suggest that GRAPH EXPO will be a good wide-format inkjet printer trade show to visit in autumn 2009.



GRAPH EXPO 2008 lobby, it's possible to observe the assistance to this trade show.



Reality Check

Being a university professor for many years does not mean we know everything. But intellectual curiosity often leads us to enter areas that are new to us. So we do not shirk from entering areas where we are obviously not yet expert. If in your years of wide format printing experience have encountered results different than ours, please let us know at ReaderService@FLAAR.org. We do not mind eating crow, though so far it is primarily a different philosophy we practice, because since we are not dependent on sales commissions we can openly list the glitches and defects of those printers that have an occasional problem.

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Starting in 2008, updates on UV-curable wide-format inkjet printers are available for all individuals and companies which have a subscription, or to companies who are research project sponsors. If you are a Subscriber or manager in a company that is a research sponsor, you can obtain the next update by writing ReaderService@FLAAR.org. If you are neither a Subscriber or a research sponsor, simply order the newest version via the e-commerce system on www.wide-format-printers.NET. Please realize that because we have so many publications and many are updated so frequently that we have no realistic way to notify any reader of when just one particular report is actually updated.

There is a free PDF that describes the UV-curable inkjet printer Subscription system. Subscriptions are available only for UV-related wide-format printer publications.

FLAAR Reports on UV-curable roll-to-roll, flatbed, hybrid, and combo printers are updated when new information is available. We tend to update the reports on new printers, on printers that readers ask about the most, and on printers where access is facilitated (such as factory visits, demo-room visits, etc).

Reports on obsolete printers, discontinued printers, or printers that not enough people ask about, tend not to be updated.

FLAAR still publishes individual reports on solvent printers, and on giclee printers, but subscriptions on these are not yet available; these FLAAR Reports on solvent, eco-solvent, and water-based wide-format printers have to be purchased one by one.

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Inclusion in this study by itself in no way endorses any printer, media, ink, RIP or other digital imaging hardware or software. Equally, exclusion from this study in no way is intended to discredit any printer.

Advisory

We do our best to obtain information which we consider reliable. But with hundreds of makes and models of printers, and sometimes when information about them is sparse, or conflicting, we can only work with what we have available. Thus you should be sure to rely also on your own research, especially asking around. Find another trustworthy end-user of the same make and model you need to know about. Do not make a decision solely on the basis of a FLAAR report because your situation may be totally different than ours. Or we may not have known about, and hence not written about, one aspect or another which is crucial before you reach your decision.

The sources and resources we may list are those we happen to have read. There may be other web pages or resources that we missed. For those pages we do list, we have no realistic way to verify the veracity of all their content. Use your own common sense plus a grain of salt for those pages which are really just PR releases or outright ads.

We are quite content with the majority of the specific printers, RIPs, media, and inks we have in the FLAAR facilities. We would obviously never ask for hardware, software, or consumables that we knew in advance would not be good. However even for us, a product which looks good at a trade show, sounds good in the ad literature, and works fine for the first few weeks, may subsequently turn out to be a lemon.

Or the product may indeed have a glitch but one that is so benign for us, or maybe we have long ago gotten used to it and have a work-around. And not all glitches manifest themselves in all situations, so our evaluator may not have been sufficiently affected that he or she made an issue of any particular situation. Yet such a glitch that we don't emphasize may turn out to be adverse for your different or special application needs.

Equally often, what at first might be blamed on a bad product, often turns out to be a need of more operator experience and training. More often than not, after learning more about the product it becomes possible to produce what it was intended to produce. For this reason it is crucial for the FLAAR team and their university colleagues to interact

with the manufacturer's training center and technicians, so we know more about a hardware or software. Our evaluations go through a process of acquiring documentation from a wide range of resources and these naturally include the manufacturer itself. Obviously we take their viewpoints with a grain of salt but often we learn tips that are worthy of being passed along.

FLAAR has no way of testing 400+ specifications of any printer, much less the over 101 different UV printers from more than 46 manufacturers. Same with hundreds of solvent printers and dozens of water-based printers. We observe as best we can, but we cannot take each printer apart to inspect each feature. And for UV printers, these are too expensive to move into our own facilities for long-range testing, so we do as best as is possible under the circumstances. And when a deficiency does become apparent, usually from word-of-mouth or from an end-user, it may take time to get this written up and issued in a new release.

Another reason why it is essential for you to ask other printshop owners and printer operators about how Brand X and Y function in the real world is that issues may exist but it may take months for these issues to be well enough known for us to know the details. Although often we know of the issues early, and work to get this information into the PDFs, access to information varies depending on brand and model. Plus with over 300 publications, the waiting time to update a specific report may be several months. Plus, once a printer is considered obsolete, it is not realistic to update it due to the costs involved.

For these reasons, every FLAAR Report tries to have its publication date on the front outside cover (if we updated everything instantly the cost would be at commercial rates and it would not be possible to cover these expenses). At the end of most FLAAR Reports there is additionally a list of how many times that report has been updated. A report with lots of updates means that we are updating that subject based on availability of new information. If there is no update that is a pretty good indication that report has not been updated! With 101 models of UV printers, several hundred solvent printers, and scores of water-based printers, we tend to give priority to getting new reports out on printers about which not much info at all is available elsewhere. So we are pretty good about reporting on advances in LED curing. But glitches in a common water-based printer will take longer to work its way through our system into an update, especially if the glitch occurs only in certain circumstances, for example, on one type of media. With several hundred media types, we may not yet have utilized the problem media. While on the subject of doing your own research, be sure to ask both the printer operator and printshop owner or manager: you will generally get two slightly different stories. A printer operator may be aware of more glitches of the printer than the owner.

If a printer is no longer a prime model then there is less interest in that printer, so unless a special budget were available to update old reports, it is not realistic to update old reports. As always, it is essential for you to visit printshops that have the printers on your short-list and see how they function in the real world.

But even when we like a product and recommend it, we still can't guarantee or certify any make or model nor its profitability in use because we don't know the conditions under which a printer system might be utilized in someone else's facility. For ink and media, especially after-market third-party ink and media, it is essential that you test it first, under your conditions. We have no way to assure that any ink or media will be acceptable for your specific needs in your specific print shop. As a result, products are described "as is" and without warranties as to performance or merchantability, or of fitness

for a particular purpose. Any such statements in our reports or on our web sites or in discussions do not constitute warranties and shall not be relied on by the buyer in deciding whether to purchase and/or use products we discuss because of the diversity of conditions, materials and/or equipment under which these products may be used. Thus please recognize that no warranty of fitness or profitability for a particular purpose is offered.

The user is advised to test products thoroughly before relying on them. We do not have any special means of analyzing chemical contents or flammability of inks, media, or laminates, nor how these need to be controlled by local laws in your community. There may well be hazardous chemicals, or outgassing that we are not aware of. Be aware that some inks have severe health hazards associated with them. Some are hazardous to breathe; others are hazardous if you get them on your skin. For example, some chemicals such as cyclohexanone do not sound like chemicals you want to breathe every day. Be sure to obtain, read, and understand the MSDS sheets for the inks, media, and laminates that you intend to use. Both solvent, eco-solvent, and UV-curable inks are substances whose full range of health and environmental hazards are not yet fully revealed. It is essential you use common sense and in general be realistic about the hazards involved, especially those which are not listed or which have not yet been described. FLAAR is not able to list all hazards since we are not necessarily aware of the chemical components of the products we discuss. Our reports are on usability, not on health hazards.

Most inks are clearly not intended to be consumed. Obviously these tend to be solvent inks and UV-curable inks. Yet other inks are edible, seriously, they are printed on birthday cakes. Indeed Sensient is a leader in a new era of edible inks. Therefore the user must assume the entire risk of ascertaining information on the chemical contents and flammability regulations relative to inks, media or laminates as well as using any described hardware, software, accessory, service, technique or products.

We have no idea of your client's expectations. What students on our campus will accept may not be the same as your Fortune 500 clients. In many cases we have not ourselves used the products but are basing our discussion on having seen them at a trade show, during visiting a print shop, or having been informed about a product via e-mail or other communication.

Results you see at trade shows may not be realistic

Be aware that trade show results may not be realistic. Trade shows are idealized situations, with full-time tech support to keep things running. The images at a trade show may be tweaked. Other images make be "faked" in the sense of slyly putting on primer without telling the people who inspect the prints. Most UV inks don't stick to all materials; many materials need to be treated.

Or the UV prints may be top-coated so that you can't do a realistic scratch test.

Booth personnel have many standard tricks that they use to make their output look gorgeous. In about half the cases you will not likely obtain these results in real life: in most cases they are printing uni-directional, which may be twice as slow as bi-directional.

Trade show examples tend to be on the absolutely best media. When you attempt to save money and use economy media you will quickly notice that you do not get anywhere near the same results as you saw in the manufacturer's trade show booth, or pictured in their glossy advertisement. Five years ago we noticed Epson was laminat-

ing prints to show glossy output because their pigmented inks could not print on actual glossy media. The same equipment, inks, media, and software may not work as well in your facility as we, or you, see it at a trade show. All the more reason to test before you buy; and keep testing before you make your final payment. Your ultimate protection is to use a gold American Express credit card so you can have leverage when you ask for your money back if the product fails.

Images printed at trade show may be in uni-directional mode: so you may not realize the printer has bi-directional (curing) banding defects until you unpack it in your printshop. Bi-directional curing banding is also known as the lawnmower effect. Many printers have this defect; sometimes certain modes can get rid of it, but are so slow that they are not productive.

You absolutely need to do print samples with your own images and the kind provided by your clients. Do not rely on the stock photos provided by the printer, ink, media, or RIP manufacturer or reseller. They may be using special images which they know in advance will look fabulous on their printer. Equally well, if you send your sample images to the dealer, don't be surprised if they come back looking awful. That is because many dealers won't make a serious effort to tweak their machine for your kind of image. They may use fast speed just to get the job done (this will result in low quality). Check with other people in your area, or in the same kind of print business that you do. Don't rely on references from the reseller or manufacturer (you will get their pet locations which may be unrealistically gushy): find someone on your own.

Factors influencing output

Heat, humidity, static, dust, experience level of your workers (whether they are new or have prior years experience): these are all factors that will differ in your place of business as compared with test results or demo room results.

Actually you may have people with even more experience than we do, since we deliberately use students to approximate newbies. FLAAR is devoted to assisting newcomers learn about digital imaging hardware and software. This is why Nicholas Hellmuth is considered the "Johnny Appleseed" of wide format inkjet printers.

Therefore this report does not warranty any product for any quality, performance or fitness for any specific task, since we do not know the situation in which you intend to use the hardware or software. Nor is there any warranty or guarantee that the output of these products will produce salable goods, since we do not know what kind of ink or media you intend to use, nor the needs of your clients. A further reason that no one can realistically speak for all aspects of any one hardware or software is that each of these products may require additional hardware or software to reach its full potential.

For example, you will most likely need a color management system which implies color measurement tools and software. To handle ICC color profiles, you may need ICC color profile generation software and a spectrophotometer since often the stock pre-packaged ICC color profiles which come with the ink, media, printers and/or RIPs may not work in your situation. Not all RIPs handle color management equally, or may work better for some printer-ink-media combinations than for others.

Be aware that some RIPs can only accept ICC color profiles: you quickly find out the hard way that you can't tweak these profiles nor generate new ones. So be sure to get a RIP which can handle all aspects of color management. Many RIPs come in different levels.

You may buy one level and be disappointed that the RIP won't do everything. That's because those features you may be lacking are available only in the next level higher of that RIP, often at considerable extra cost. Same thing in the progression of Chevy through Pontiac to Cadillac, or the new Suburbans. A Chevy Suburban simply does not have all the bells and whistles of the Cadillac Escalade version of this SUV.

Don't blame us... besides, that's why we are warning you. This is why we have a Survey Form, so we can learn when you find products that are inadequate. We let the manufacturers know when end users complain about their products so that the manufacturers can resolve the situation when they next redesign the system.

Most newer printer models tend to overcome deficiencies of earlier models. It is possible that our comparative comments point out a glitch in a particular printer that has been taken care of through an improvement in firmware or even an entirely new printer model. So if we point out a deficiency in a particular printer brand, the model you may buy may not exhibit this headache, or your kind of printing may not trigger the problem. Or you may find a work-around.

Just remember that every machine has quirks, even the ones we like. It is possible that the particular kind of images, resolution, inks, media, or other factors in your facility are sufficiently different than in ours that a printer which works just fine for us may be totally unsatisfactory for you and your clients. However it may be that the specific kind of printing you need to do may never occasion that shortcoming. Or, it may be that your printer was manufactured on a Monday and has defects that are atypical, show up more in the kind of media you use which we may not use as often or at all during our evaluations. Equally possibly a printer that was a disaster for someone else may work flawlessly for you and be a real money maker for your company.

So if we inspect a printer in a printshop (a site-visit case study), and that owner/operator is content with their printer and we mention this; don't expect that you will automatically get the same results in your own printshop.

In some cases a product may work better on a Macintosh than on a PC. RIP software may function well with one operating system yet have bugs and crash on the same platform but with a different operating system. Thus be sure to test a printer under your own specific work conditions before you buy.

And if a printer, RIP, media, or ink does not function, return it with no ands, ifs or buts. Your best defense is to show an advertising claim that the printer simply can't achieve. Such advertising claims are in violation of federal regulations, and the printer companies know they are liable for misleading the public.

But before you make a federal case, just be sure that many of the issues are not user error or unfamiliarity. It may be that training or an additional accessory can make the printer do what you need it to accomplish. Of course if the printer ads did not warn you that you had to purchase the additional pricey accessory, that is a whole other issue. Our reviews do not cover accessories since they are endless, as is the range of training, or lack thereof, among users.

The major causes of printer breakdown and failure is lack of maintenance, poor maintenance, spotty maintenance, or trying to jerry-rig some part of the printer. The equally common cause of printer breakdown is improper use, generally due from lack of training or experience. Another factor is whether you utilize your printer all day

every day. Most solvent and UV printers work best if used frequently. If you are not going to use your printer for two or three days, you have to put flush into the system and prepare it for hibernation (even if for only four or five days). Then you have to flush the ink system all over again.

Also realize that the surface of inkjet prints are fragile and generally require lamination to survive much usage. Lamination comes in many kinds, and it is worth finding a reliable lamination company and receiving training on their products.

Also realize that no hybrid or combo UV printer can feed all kinds of rigid materials precisely. Some materials feed well; others feed poorly; others will skew.

Although we have found several makes and models to work very well in our facilities, how well they work in your facilities may also depend on your local dealer. Some dealers are excellent; others just sell you a box and can't provide much service after the sale. Indeed some low-bid internet sales sources may have no technical backup whatsoever. If you pay low-bid price, you can't realistically expect special maintenance services or tech support later on from any other dealer (they will tell you to return to where you paid for the product). This is why we make an effort to find out which dealers are recommendable. Obviously there are many other dealers who are also good, but we do not always know them. To protect yourself further, always pay with a level of credit card which allows you to refuse payment if you have end up with a lemon. A Gold American Express card allows you to refuse payment even months after the sale. This card may also extend your warranty agreement in some cases (check first).

Most of the readers of the FLAAR Reports look to see what printers we use in our own facilities. Readers realize that we will have selected the printers that we like based on years of experience and research. Indeed we have met people at trade shows who told us they use the FLAAR web site reports as the shopping list for their corporate purchases.

Yes, it is rather self-evident that we would never ask a manufacturer to send a product which we knew in advance from our studies was no good. But there are a few other printers which are great but we simply do not have them in our facilities yet.

So if a printer is not made available by its manufacturer, then there is no way we can afford to have all these makes and models in our facility. Thus to learn about models which we do not feature, be sure to ask around in other print shops, with IT people in other corporations, at your local university or community college. Go to trade shows... but don't use only the booth...ask questions of people in the elevator, in line at the restaurant, anywhere to escape the smothering hype you get in the booth.

Realize that a FLAAR Report on a printer is not by itself a recommendation of that printer. In your local temperature, in your local humidity, with the dust that is in your local air, with your local operator, and with disorientation of the insides of a printer during rough shipment and installation, we have no knowledge of what conditions you will face in your own printshop. We tend to inspect a printer first in the manufacturing plant demo room: no disjointed parts from any shipment since this printer has not been lifted by cranes and run over a rough pot-holed highway or kept in smelting heat or freezing cold during shipment.

Taking into consideration we do not know the conditions in which you may be using your hardware, software, or consumables, neither

the author nor FLAAR nor either university is liable for liability, loss or damage caused either directly or indirectly by the suggestions in this report nor by hardware, software, or techniques described herein because.

Availability of spare parts may be a significant issue

Chinese printers tend to switch suppliers for spare parts every month or so. So getting spare parts for a Chinese printer will be a challenge even if the distributor or manufacturer actually respond to your e-mails at all. Fortunately some companies do have a fair record of response; Teckwin is one (based on a case of two problematical hybrid UV printers in Guatemala). The distributor said that Teckwin sent a second printer at their own expense and sent tech support personnel at their expense also. But unfortunately both the hybrid UV printers are still abandoned in the warehouse of the distributor; they were still there in January 2009. But Teckwin has the highest rating of any Chinese company for interest in quality control and realization that it is not good PR to abandon a client or reseller or distributor all together.

Recently we have heard many reports of issues of getting parts from manufacturers in other countries (not Asia). So just because your printer is made in an industrialized country, if you are in the US and the manufacturer is X-thousand kilometers or miles away, the wait may be many days, or weeks.

Lack of Tech Support Personnel is increasing

The book of sales in the third quarter of 2008 resulted in many tech support problems.

The recession resulted in even more: some manufacturers may need to skimp on quality control during a recession, or switch to cheaper parts suppliers. Plus they are not hiring enough tech support during a recession. So the bigger and more successful the company, in some cases the worse these particular problems may be.

Any new compiled printer may take a few months to break in

Any new printer, no matter who the manufacturer, or how good is the engineering and electronics, will tend to have teething issues. Until the firmware is updated, you may be a beta tester. This does not mean the printer should be avoided, just realize that you may have some downtime and a few headaches. Of course the worst case scenario for this was the half-million dollar LUSCHER JetPrint: so being "Made in Switzerland" was not much help.

Counterfeit parts are a problem with many printers made in China

Several years ago many UV printers made in China and some made elsewhere in Asia had counterfeit parts. No evaluation has the funding available to check parts inside any printer to see if they are from the European, Japanese, or American manufacturer, or if they are a clever counterfeits.

Be realistic and aware that not all materials can be printed on equally well

Many materials don't feed well through hybrid (pinch roller on grit roller systems) or combo UV systems (with transport belts). Banding, both from poor feeding, and from bi-directional (lawnmower effect) are common on many UV-curable inkjet printers.

It is typical for some enthusiastic vendors to claim verbally that their printer can print on anything and everything. But once you unpack

the printer and set it up, you find that it requires primer on some materials; on other materials it adheres for a few weeks but then falls off.

And on most hybrid and many combo printers, some heavy, thick, or smooth-surfaced materials skew badly. Since the claim that the printer will print on everything is usually verbal, it is tough to prove this aspect of misleading advertising to a jury.

Not all inks can print on all materials. And at a trade show, many of the materials you see so nicely printed on, the manufacturer may be adding a primer at night or early in the morning: before you see the machine printing on this material.

We feel that the pros and cons of each product speak more than adequately for themselves. Just position the ad claims on the left: put the actual performance results on the right. The unscrupulous hype for some printers is fairly evident rather quickly.

Be sure to check all FLAAR resources

Please realize that with over 200 different FLAAR Reports on UV printers, you need to be sure to check the more obscure ones too. If a printer has a printhead issue, the nitty gritty of this may be in the FLAAR Report on printheads. The report on the model is a general introduction; if we discussed the intimate details of printheads then some readers might fall asleep. And obviously do not limit yourself to the free reports. The technical details may be in the reports that have a price to them. Our readers have said they prefer to have the general basics, and to park the real technical material in other reports that people can buy if they really want that level of information.

So it may be best to ask for personal consulting. The details of the problems with the ColorSpan 5400uv series are rather complex: namely the center row of the Ricoh printheads. This would require an expensive graphic designer and consultants to show the details. And the design of the printhead would probably be altered by the time we did any of this anyway. So it is essential to talk with people: with other end-users, and with FLAAR in person on a consulting basis.

Acknowledgments

With 12 employees the funding has to come from somewhere, so we do welcome project sponsorship, research grants, contributions that facilitate our educational programs, scholarships for co-op interns and graduate students, and comparable project-oriented funding from manufacturers. The benefit for the end-user is a principle called academic freedom, in this case,

- The freedom of a professor or student to speak out relative to the pros and cons of any equipment brought to them to benchmark.
- The freedom to design the research project without outside meddling from the manufacturer.

Fortunately, our budget is lean and cost effective as you would expect for a non-profit research institute. As long as we are not desperate for money we can avoid the temptation to accept payment for reprinting corporate PR hype. So the funding is used for practical research. We do not accept (nor believe) and certainly do not regurgitate corporate PR. For example, how many manufacturer's PR photos of their products have you seen in our reports or on our web sites?

Besides, it does not take any money to see which printers and RIPs function as advertised and which don't. We saw one hyped printer grind to a halt, malfunction, or otherwise publicly display its incapacibilities at several trade shows in a row. At each of those same trade

shows another brand had over 30 of their printers in booths in virtually every hall, each one producing museum quality exhibits. Not our fault when we report what we see over and over and over again. One of our readers wrote us recently, "Nicholas, last month you recommended the as one of several possible printers for our needs; we bought this. It was the best capital expenditure we have made in the last several years. Just wanted to tell you how much we appreciate your evaluations...."

FLAAR is a non-profit educational and research organization dedicated for over 36 years to professional photography in the arts, tropical flora and fauna, architectural history, and landscape panorama photography.

Our digital imaging phase is a result of substantial funding in 1996 from the Japanese Ministry of Public Education for a study of scanning and digital image storage options. This grant was via Japan's National Museum of Ethnology, Osaka, Japan. That same year FLAAR also received a grant of \$100,000 from an American foundation to do a feasibility study of digital imaging in general and the scanning of photographic archives in particular.

The FLAAR web sites began initially as the report on the results of these studies of scanners. Once we had the digital images we began to experiment with digital printers. People began to comment that our reports were unique and very helpful. So by 1999 we had entire sections on large format printers.

FLAAR has existed since 1969, long before inkjet printers existed. Indeed we were writing about digital imaging before HP even had a color inkjet system available. In 2000 FLAAR received an educational grant from Hewlett-Packard large format division, Barcelona, Spain, for training, for equipment, and to improve the design and navigation on the main web sites of the FLAAR Network. This grant ran its natural course, and like all grants, reached its finishing point, in this case late 2005.

In some cases the sponsorship process begins when we hear end-users talking about a product they have found to be better than other brands. We keep our ears open, and when we spot an especially good product, this is the company we seek sponsorship from. It would not be wise of us to seek sponsorship from a company with a sub-standard or otherwise potentially defective printer. So we usually know which printers are considered by end-users to be among the better brands before we seek sponsorship. After all, out of the by now one million readers, we have heard plenty about every single printer out there.

We thank MacDermid ColorSpan (now part of HP), Hewlett-Packard, Parrot Digigraphic, Color DNA, Canon, Gandinnovations, and other companies for providing funding for technology training for the FLAAR staff and our colleagues at Bowling Green State University in past years and for funds to allow us to attend all major international trade shows, which are ideal locations for us to gather information. We thank Sun LLC, Caldera, Raster Printers (EFI Rastek), DEC LexJet, DigiFab, Barbieri electronic, Seiko, Mutoh Europe, IP&I, Dilli, Yuhan-Kimberly, GCC, Grapo, Durst, and WP Digital for providing funds so that we can make more of our publications free to end-users. During 2000-2001 we had grants to cover all the costs of our publications, and all FLAAR Reports were free in those early years. As that early grant naturally expired after a few years, we had to begin charging for some of our reports to cover costs. Now (in 2009), we are seeking corporate sponsorship so we can gradually make another 20% of our publications free to our readers.

Since 2006 we do a major part of our evaluations at a factory and headquarters demo room. Since the university does not fund any of

these trips, it is traditional for the manufacturer to fund a research sponsorship. In the US this is how most university projects are initiated for decades now, and it is increasing. In fact there is a university in Austria that is not an "edu" but is a "GmbH", funded by the chamber of commerce of that part of Austria. In other words, a university as an educational institution, but functioning in the real world as an actual business. This is a sensible model.

It has been helpful when companies make it possible for us to fly to their headquarters so we can inspect their manufacturing facilities, demo rooms, and especially when the companies make their research, engineering and ink chemistry staff available for discussions. When I received my education at Harvard I was taught to have a desire to learn new things. This has guided my entire life and is what led me into wide-format digital imaging technology: it is constantly getting better and there is a lot to learn every month. Thus I actively seek access to improving my understanding of wide format printer technology so that we can better provide information to the approximately quarter-million+ readers of our solvent and UV printer web site (www.large-format-printers.org) and the over half a million who read either our wide-format-printers.org site or our roughly half million combined who read our digital-photography.org and www.FineArtGicleePrinters.org sites.

Barbieri electronic (color management), Caldera (RIP), ColorSpan, DEC, Durst, Gerber, Grapo, IP&I, Mimaki USA, Mutoh, Dilli, GCC, NUR, Oce, Shiraz (RIP), Sun, Teckwin, VUTEK, WP Digital, Xerox, Yuhan-Kimberly, Zund have each brought FLAAR staff to their headquarters and printer factories. Bordeaux, InkWin and Sunflower ink have brought us to inspect their ink manufacturing facilities and demo rooms. We have visited the world headquarters and demo rooms of HP in Barcelona and received informative and helpful technology briefings. We are under NDA as to the subjects discussed but it is important that we be open where we have visited. Mimaki Europe has had FLAAR as their guest in Europe to introduce their flatbed UV printer, as have other UV-curable manufacturers, again, under NDA as to the details since often we are present at meetings where unreleased products are discussed. Xaar has hosted an informative visit to their world headquarters in the UK. You don't get this level of access from a trade magazine writer, and I can assure you, we are provided much more detailed information and documentation in our visits than would be provided to a magazine author or editor. Companies have learned that it's a lot better to let us know up front and in advance the issues and glitches with their printers, since they now know we will find out sooner or later on our own. They actually tell us they realize we will find out on our own anyway.

Contributions, grant, sponsorships, and project funds from these companies are also used to improve the design and appearance of the web sites of the FLAAR Information Network. We thank Canon, ColorSpan, HP, ITNH, and Mimaki for providing wide format printers, inks, and media to the universities where FLAAR does research on wide format digital imaging. We thank Epson America for providing an Epson 7500 printer many years ago, and Parrot Digigraphic for providing three different models of Epson inkjet printers to our facilities on loan at BGSU (5500, 7600, 7800). We thank Mimaki USA for providing a JV4 and then a Mimaki TX-1600s textile printer and Improved Technologies (ITNH) providing their Ixia model of the Iris 3047 giclee printer.

We thank 3P Inkjet Textiles and HP for providing inkjet textiles so we could learn about the different results on the various textiles. IJ Technologies, 3P Inkjet Textiles, ColorSpan, Encad, HP, Nan Ya Pepa, Oracal, Tara and other companies have provided inkjet media so we can try it out and see how it works (or not as the case may be; several

inkjet media failed miserably, one from Taiwan, the other evidently from Germany!). We thank Aurelon, Canon, ColorGate, ColorSpan, ErgoSoft, HP, PerfectProof, PosterJet, Onyx, Ilford, CSE ColorBurst, ScanvecAmiable, Wasatch and many other RIP companies for providing their hardware and software RIPs.

We thank Dell Computers for providing awesome workstations for testing RIP software and content creation with Adobe Photoshop and other programs. We also appreciate the substantial amount of software provided by Adobe. As with other product loaned or provided courtesy of ProVar LLC (especially the 23" monitors which makes it so much easier to work on multiple documents side by side).

We thank Betterlight, Calumet Photographic, Global Graphics, Westcott, Global Imaging Inc. Phase One, and Bogen Imaging for helping to equip our archaeological photo studios at the university and its archaeology museum in Guatemala. Heidelberg, Scitex, CreoScitex (now Kodak) and Cruse, both in Germany, have kindly provided scanners for our staff to evaluate.

We really liked some of the results whereas some of the other products were a bit disappointing. Providing samples does not influence the evaluations because the evaluators are students, professors, and staff of Bowling Green State University. These personnel are not hired by any inkjet printer company; they were universities employees (as was also true for Nicholas Hellmuth). The testing person for the HP ColorPro (desktop printer) said he frankly preferred his Epson printer. When we saw the rest results we did not include this Hewlett-Packard ColorPro printer on our list of recommended printers, but we love our HP DesignJet 5000ps so much we now have two of them, one at each university.

Sometimes we hear horror stories about a printer. The only way we can tell whether this is the fault of the printer design, or lack of training of the operator, is to have the printer ourselves in-house. Of course some printer manufacturers don't understand the reasons we need to have each make and model; they are used to loaning their demo units for a week or so. That is obviously inadequate for a serious review.

Some of the media provided to us failed miserably. Three printers failed to meet common sense usability and printability standards as well (HP 1055, one older desktop model (HP Color Pro GA), and one Epson). Yet we know other users who had better results; maybe ours came down the assembly line on a Monday or Friday afternoon, when workers were not attentive. One costly color management software package was judged "incapable" by two reviewers (one from the university; second was an outside user who had made the mistake of buying this package).

So it's obvious that providing products or even a grant is no shield from having your products fail a FLAAR evaluation. The reason is clear: the end user is our judge. The entire FLAAR service program is to assist the people who need to use digital imaging hardware and software. If a product functions we find out and promulgate the good news. If a product is a failure, or more likely, needs some improvement in the next generation, we let people know. If a product is hyped by what an informed user would recognize as potentially false and misleading nonsense, then we point out the pathetic discrepancies very clearly.

This is what you should expect from an institute which is headed by a professor.

Actually, most of our reviews are based on comments by end users. We use their tips to check out pros and cons of virtually every product

we discuss. You can't fool a print shop owner whose printer simply fails to function as advertised. And equally, a sign shop owner who earns a million dollars a year from a single printer brand makes an impact on us as well. We have multiple owners of ColorSpan printers tell us that this printer is their real money earner for example. We know other print shops where their primary income is from Encad printers. Kinkos has settled on the HP 5000 as its main money maker production machine, and so on.

Yet we have documentation of several print shop companies whose business was ruined by specific brands that failed repeatedly. It is noteworthy that it is always the same brand or printer at both locations: one due to banding and printheads then simply no longer printing one color; the other brand due to pokiness of the printer simply not being competitively fast enough. Same with RIPs, we have consistent statements of people using one RIP, and only realizing how weak it was when they tried another brand which they found substantially better. Thus we note that companies which experiment with more than one brand of product tend to realize more quickly which brand is best. This is where FLAAR is in an ideal situation: we have nine RIPs and 25 printers. Hence it is logical that we have figured out which are best for our situation.

Grant funding, sponsorship, demonstration equipment, and training are supplied from all sides of the spectrum of printer equipment and software engineering companies. Thus, there is no incentive to favor one faction over another. We receive support from three manufacturers of thermal printheads (Canon, ColorSpan and HP) and also have multiple printers from three manufacturers of piezo printers (Epson, Seiko, Mutoh, and Mimaki). This is because piezo has definite advantage for some applications; thermal printheads have advantages in different applications. Our reviews have universal appeal precisely because we feature all competing printhead technologies. Every printer, RIPs, inks, or media we have reviewed have good points in addition to weaknesses. Both X-Rite and competitor GretagMacbeth provided spectrophotometers. Again, when all sides assist this program there is no incentive to favor one by trashing the other. Printer manufacturer ad campaigns are their own worst enemy. If a printer did not make false and misleading claims, then we would have nothing to fill our reviews with refuting the utter nonsense that is foisted on the buying public.

It is not our fault if some printers are more user friendly, print on more media than other brands. It is not our fault that the competing printers are ink guzzlers, are slow beyond belief, and tend to band or drop out colors all together. We don't need to be paid by the printer companies whose products work so nicely in both our universities on a daily basis. The printers which failed did so in front of our own eyes and in the print shops of people we check with. And actually we do try to find some redeeming feature in the slow, ink gulping brands: they do have a better dithering pattern; they can take thick media that absolutely won't feed through an HP. So we do work hard at finding the beneficial features even of printers are otherwise get the most critique from our readers. Over one million people will read the FLAAR Information Network in the next 12 months; 480,000 people will be exposed to our reports on wide format printers from combined total of our three sites on these themes. You can be assured that we hear plenty of comments from our readers about which printers function, and which printers fail to achieve what their advertising hype so loudly claims.

An evaluation is a professional service, and at FLAAR is based on more than 11 years of experience. An evaluation of a printer, an ink, a software, laminator, cutter or whatever part of the digital printing workflow is intended to provide feedback to all sides. The manufacturers appreciate learning from FLAAR what features of their printers

need improvement. In probably half the manufacturers FLAAR has dealt with, people inside the company did not, themselves, want to tell their boss that their pet printer was a dog. So printer, software, and component manufacturers have learned that investing in a FLAAR evaluation of their product provides them with useful return on investment. Of course if a printer manufacturer wants only a slick Success Story, or what we call a "suck up review" that simply panders to the manufacturer, obviously FLAAR is not a good place to dare to ask for such a review. In several instances it was FLAAR Reports that allowed a company to either improve their printer, or drop it and start from scratch and design a new and better one.

And naturally end-users like the opportunity to learn about various printers from a single source that covers the entire range from UV through latex through all flavors of solvent.

We have also learned that distributors often prefer to accept for distribution a printer or other product on which a FLAAR Report already exists.

We turn down offers of funding every year. These offers come from PO Box enterprises or products with no clearly visible point of manufacture. Usually the company making the offer presumes they can buy advertising space just by paying money. But that is not what our readers want, so we politely do not accept such offers of money.

Contributions, grants, sponsorships, and funding for surveys, studies and research is, however, open to a company who has an accepted standing in the industry. It is helpful if the company has a visible presence at leading trade shows and can provide references from both end users and from within the industry. Where possible we prefer to visit the company in person or at least check them out at a trade show. Obviously the product needs to have a proven track record too. Competing companies are equally encouraged to support the FLAAR system. We feel that readers deserve to have access to competing information. Competition is the cornerstone of American individualism and technological advancement.

FLAAR also covers its costs of maintaining the immense system of 8 web sites in three languages and its facilities in part by serving as a consultant such as assisting inkjet manufacturers learn more about the pros and cons of their own printers as well as how to improve their next generation of printers. It is especially useful to all concerned when manufacturers learn of trends (what applications are popular and for what reasons). For example, manufacturers need to know whether to continue designing software for Mac users, or concentrate software for PC users. So the survey form that you fill out is helpful to gather statistics. You benefit from this in two ways: first, you get the FLAAR reports in exchange for your survey form. Second, your comments bring (hopefully) change and improvement in the next generation of printers. When we do survey statistics, then the names, addresses, and telephone numbers are removed completely. A survey wants only aggregate numbers, not individuals. However, if you ask about a specific brand of printer, and do not opt out, we forward your request to a pertinent sponsor so you can obtain follow-up from that brand, since we ourselves do not have enough personnel to respond to each reader by telephone. But we do not provide your personal information to outsiders and our survey form has an opt out check-off box which we honor.

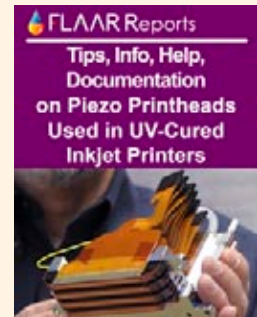
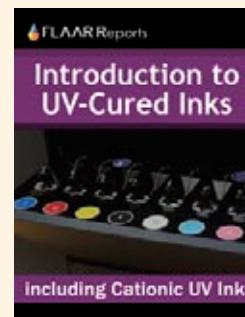
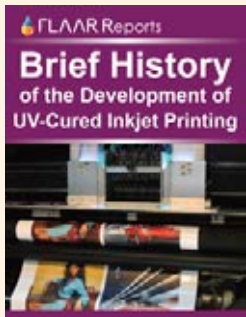
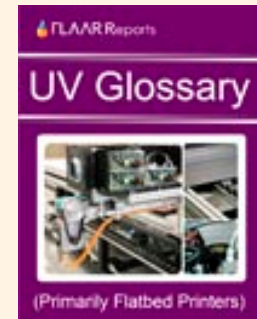
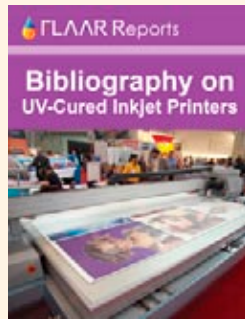
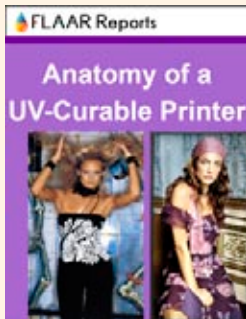
FLAAR also serves as consultants to Fortune 500 companies as well as smaller companies and individuals who seek help on which printers to consider when they need digital imaging hardware and software.

A modest portion of our income comes from our readers who purchase the FLAAR series. All income helps continue our tradition of independent evaluations and reviews of inkjet printers, RIPs, media, and inks.

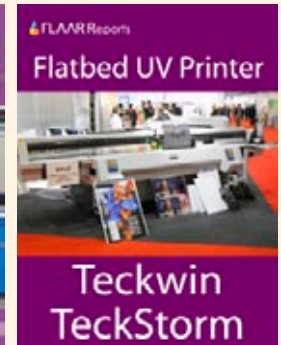
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