FLAAR Reports

June 2008

Learning about UV-Curable Flatbed Inkjet Printers

By visiting the factory where they are designed and manufactured

Dr Nicholas Hellmuth

UV-Curable Printers: Factory Visits as a Learning Experience

When you visit a trade show, often it's rather hectic in a booth. The person that you end up with may be a sales rep with limited practical experience with actually operating the printer. In some cases there are personality differences. We receive many e-mails where printshop owners tell us they simply left the booth because they could not find someone that could communicate on their wave length.

So some printshop owners buy the printer from the booth that treats them the nicest. In one instance this led to not only the wrong purchase, the purchase of a UV printer that fell apart and was a disaster for the sign shop that bought it. I asked them why they did not buy a better brand; they replied that the people at that other booth "did not give them the time of day."

This can happen if the booth is very busy, or if there are distractions.

One way around this is to arrange a factory demo-room visit. In some cases the demo-room is physically at the factory. In most cases the demo room is at another location. Gandinnovations has a demo room in San Antonio, Texas, but has a larger demo room at their manufacturing plant in Toronto.

Inspecting Grapo Manta in the Czech Republic

Inspecting the core structure of a Gandinnovations Jeti flatbed inside their factory in Canada

Inspecting the "gull wing" 4x8' model of the Gandinovation Jeti UV flatbed inside it's factory

Inspecting the Nur Expedio 5000 inside their factory in Israel

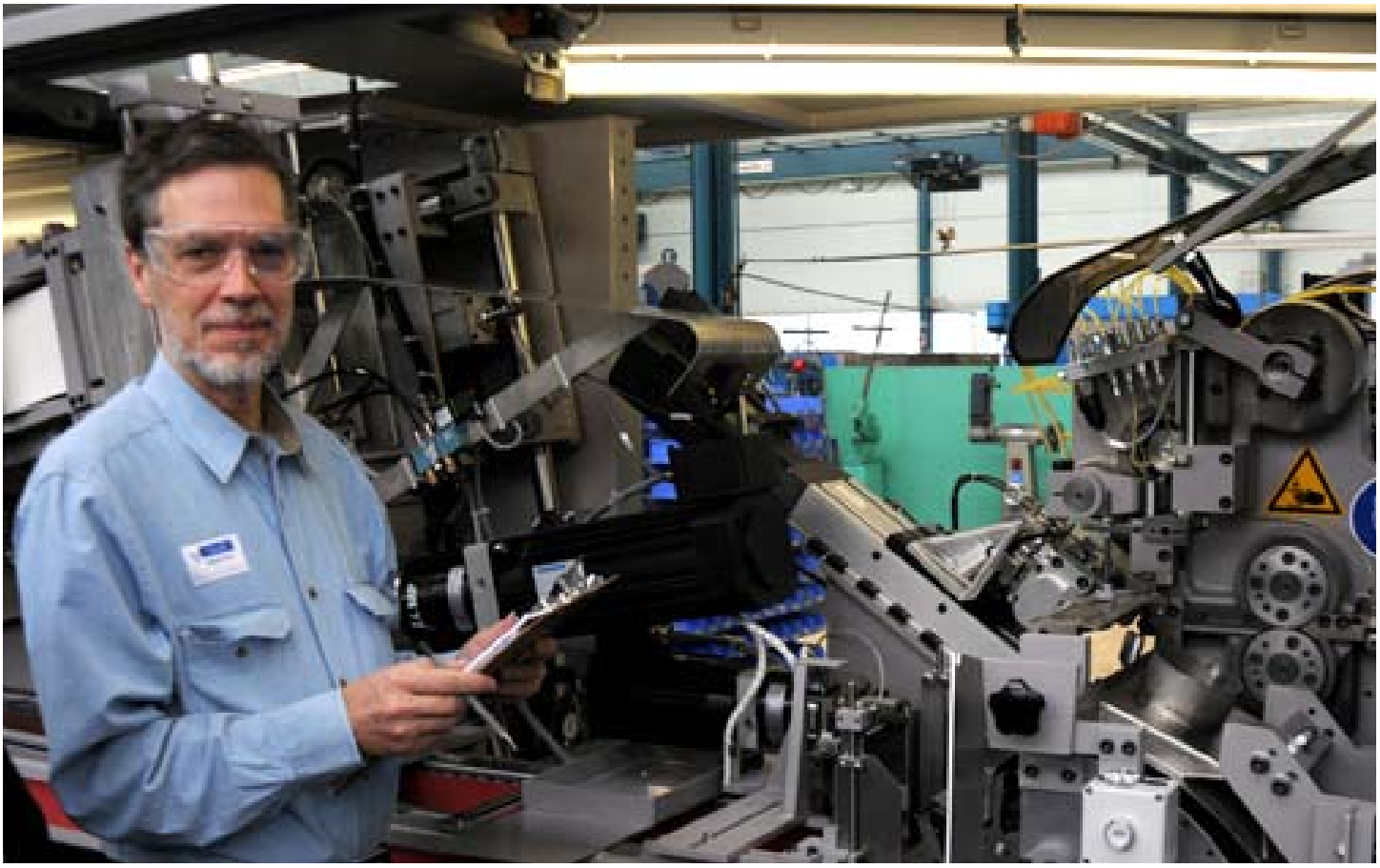
FLAAR inspection as part of training on Mutoh mild-solvent and eco-solvent at the factory in Belgium

Spühl

Spühl AG in Switzerland is part of the American company, Leggett & Platt. The grand-format UV-curable printers of Spuhl sell in Europe and Asia. The North American and Latin American market is served by L&P Digital Technologies in Florida.

The Spühl factory makes two widths of a sophisticated transport belt flatbed. The L&P factory in the US makes a slightly different model with MEMS printheads.

It was possible to visit the Swiss factory for an entire day. I have not yet been to the L&P factory in Florida.



Dr Nicholas at Leggend & Platt® Spuhl AG, Wittencach, Switzerland

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Sun LLC in Russia

Sun LLC is not related to Sun Chemical of the UK, Germany, etc. Sun LLC specializes in developing LED lamp systems for cool-curing of UV ink.

Since it was possible to spend a week at the Sun headquarters in Novosibirsk, three separate publications resulted. So there are scores of photos of this company (of over 250 people), in these three FLAAR Reports.

MacDermid ColorSpan UV Printers

I have been to the factory of MacDermid three times. The second time was to inspect the 9840uv a week before it was introduced to the public, at FESPA Digital 2006 in Amsterdam.

My most recent visit was to inspect an early pre-production beta version of the new 5400uv series three months before it was announced to the public. I was under so many layers of Non-Disclosure Agreement that I could not even tell my own staff what I had seen. The NDA was released on Feb 12th, and our FLAAR Reports was on www.wide-format-printers.NET by late afternoon. Our page with two photos and first comments has been on www.large-format-printers.org since the morning of Feb. 12th.

The first visit was many years ago to get training on the DisplayMaker water-based printers. We received two of these for evaluation at our university. Of course today (2007) ColorSpan is concentrating on UV printers exclusively. They no longer manufacturer water-based printers. However tech support, and parts and ink, are still available for all their earlier giclee printers, water-based sign printers, and solvent machines.

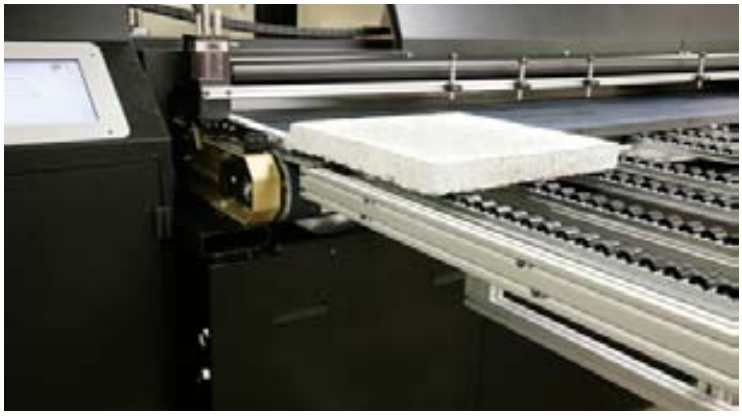
ColorSpan 9840uv

This $150,000 printer can print on concrete, wood, and office cubicle partition walls. In other words, this kind of printer should be of interest to artists, architects and interior designer faculty on campus.

ColorSpan 9840uv site visit

ColorSpan 9840uv site visit

ColorSpan 9840uv printing on wood



ColorSpan 9840uv printing on concrete

The main benefit of my last two visits was to notice that even the beta-stage pre-production prototypes function. In comparison, the first Chinese UV printers tend not to function well their first year or so after being released. This is because UV-curing technology is complex, and it takes their engineers a while to realize that you can't just put UV lamps onto a former solvent printer chassis.

A printshop where we do site-visit case studies has also made at least two trips to MacDermid ColorSpan headquarters in Minneapolis. They have bought a ColorSpan 72UVX as a result. Site-visit case studies of both these models reveal that printshops that own them are content because these printers are productive.

If your local dealer or distributor has a fully-equipped demo room in your home town, this may be more convenient than traveling to Minneapolis. We at FLAAR have also visited local ColorSpan dealers, such as Queen City Reprographics (Resource Imaging Supply, tel 800 INK-JETT) in Cincinnati.

Of course in addition to a factory visit you also need a site-visit case study. When you interview people who own a ColorSpan UV printer, you find out which features need(ed) improvement.

ColorSpan 5400uv

ColorSpan 5400uv

ColorSpan 5400uv

ColorSpan 5400uv

When you have a private showing of the new technology, without the hectic and distractions of a trade show, this is an ideal time to take snapshots that will enhance PowerPoint presentations for seminars, workshops, and conferences.

With the availability of these photos FLAAR is in a unique position, indeed that's why FLAAR is increasingly invited to speak at international trade shows and conferences.

Raster Printers Demo Room, California

FLAAR spent one week in the Raster Printers headquarters in summer 2005 and made an additional visit in 2006. Although these printers are manufactured in China (by the same company that makes Flora and DuPont Cromaprint 22uv) they are remanufactured in California. The Chinese printer comes in, a dozen parts are removed and replaced with sturdier parts made in Europe, the US, or Japan. So we will consider this as a factory visit.

If you spend an entire week inside the headquarters building of a printer company you can't help but learn a lot about them. And I mean more than just the machines; you learn about the people, whether they are capable or not. It turns out that most of the managers and owners of Raster Printers company each have more than 12 years experience in wide-format inkjet printers. Although this by itself may not make a printer's mechanical parts and software work flawlessly, it does point in the right direction. The model 720UVX and Daytona have become progressively better as everyone involved has gained more experience in UV printers.

The next generation Raster Printers machine is being manufactured entirely in the US, and we anticipate being invited to see this other factory in the future (as soon as they are ramped up to produce this new model, a 4x5-foot dedicated flatbed, the Daytona T600UV). The current Chinese-made UV printer is a hybrid design (platen, pinch rollers working together with grit rollers).

Inside the Raster Printers factory in California

GRAPO

I visited the GRAPO factory in the beautiful Czech Republic after Photokina 2006. This was the first UV printer factory that I had visited other than that of ColorSpan. It was possible to send several days at GRAPO and inspect the roll-fed Octopus and the dedicated flatbed (Manta).

Zünd UV printers

It was possible to spend two informative days in the Zund factory in Switzerland and see the final model 215 UV printer being assembled. This month in 2007 (just before a trade show in Germany) was also the last year when the Zund model 250 Combi was being assembled. From the end of 2007 onward Zund is concentrating on producing flatbed XY cutters (see next page).

In its time, the Zund 215 series was the #1 best-selling UV printer in the world. Then ColorSpan came out with a simpler model at almost half the price: and sold over 900 of their ColorSpan printer. But the Zund 215 series UV printers are part of the history of UV-curable inkjet technology.

As an excellent example of Swiss engineering innovativeness, the Zund model 250 Combi was a monument to clever design. Despite its name, the 250 is actually a hybrid printer but has an add-on capability that turns it into a dedicated flatbed.

Unfortunately Sericol did not notify Zund that Sericol cationic ink chemistry did not work, and featuring this Sericol cationic ink was a disaster for Zund. About two years later another cationic ink (from partners of KonicaMinolta printhead division) was a total failure for the Durst Rho 350R. By good luck the Durst Rho had the cationic ink only as an option, not as the main ink, and the second-generation Rho 351R, using regular free radical kind of UV chemistry is a great system. While on the subject of cationic ink, Gerber is still struggling with the systematic problems of cationic ink chemistry in the Gerber ion (there are two FLAAR Reports on this cationic ink; one on the Gerber ion, and a second report on UV ink in general).

It took Zund two years to get rid of the cationic ink system and replace it with free radical; it was the new improved system that I inspected for two days. This was an impressive printer, but at Swiss prices it is no longer competitive against GCC, IP&I, Dilli (and Agfa).

Zund XY Cutters for thick and rigid materials printed with UV printers

FLAAR has a separate report on XY cutters, so we defer to this separate publication.

Gandinnovations Demo Room, San Antonio, Texas

When a factory is outside the USA then you might wish to consider visiting the headquarters of the sales department that is in the US. Since Gandinnovations is the fastest growing solvent and UV-printer company in the world, I felt it was worth visiting.

It was over a year ago, and not every model was available (because the Jeti printers are selling so well they don't have any extras to always have each model in the demo room).

Gandinnovations Factory, Toronto, Canada

Notice I classify them as the fastest growing: other companies are larger because they have been around longer. But Gandinnovations sells more UV-cured printers than Agfa, HP-Scitex, Mimaki and Neolt put together. For 2007 and definitely by 2008, Gandinnovations will reach par with Vutek and could potentially gradually outsell them.

When you visit the company headquarters in Toronto you can see why they are so successful. Everyone here is excited about their constantly developing new technologies, new products, new ink chemistries. So attire is what you expect at the highly successful Silicon Valley companies: informal, definitely no suits or coats-and-ties.

The dedication of each individual was noticeable. Even late into the evening many of the people, of all levels, technical engineers and management both, were still doing their thing. Not because someone told them to, but because they enjoy working with such top notch technology.

You constantly read about American car manufacturing plants being shut down because everyone prefers a better-made Japanese car. In this inkjet printer plant they are growing every month; no one is going to shut this place down. Indeed there are more orders for their Jeti printers than can be fulfilled. The printers are selling faster than they can be manufactured (probably because they are all hand made, which insures each part is done nicely).

I guess no printer is perfect, but it would be a challenge to find something about these printers that fails to function. Since each machine is modular, improvements can easily be added. You are not stuck having to buy an entirely new and different model. With other printer brands, once they find out what is iffy on a current model, they have to completely redesign the entire system to overcome the issues. So people get stuck with an old model with minimal resale value. And only people that buy the new and different model get the improvements.

With L&P Virtu and with Gandinnovations Jeti printers, the new features can usually be added to older current models. Chinese printer models get confusing because they change them too often: this makes finding spare parts unrealistic even a year afterwards.

Every minute in this Gandinnovations factory was a new learning experience. The staff at all levels were pleasant and helpful in answering questions. Every minute in this factory was a new learning experience. The staff at all levels were pleasant and helpful in answering questions. They let me take photographs all through the factory; only in one place they asked that I not photograph a particularly unique assembly processes.

This is the demo room; the factory is behind the doors. It is so much easier to take useful photos to illustrate our FLAAR Reports in the demo room than at a hectic trade show

This is the new enclosed version of the Gandinnovations Jeti 3.3 solvent ink printer. Enclosures help with air quality control, especially in countries or states such as California that have stricter rules than other places

VUTEk (EFI)

I visited the VUTEk factory once about eight years ago (before UV), and three times during 2007.

Two publications resulted, one on QS UV printers, a second report on the solvent-dye sub switch-over printer.

Durst

The difference in solidness of individual parts and sophistication of a printer is quite distinct when you have been in a US factory and then visit either or both of the Durst factories in Europe. So far the Durst Rho printers are the most heavy-duty machines I have seen, with Spühl (L&P Virtu) and Gandinnovations close. On the dates that I visited VUTEk in New Hampshire I had not yet experienced seeing Swiss technology at Spuhl nor “Germanic” style engineering at the Durst factories in Austria and adjacent South Tirol (part of northern Italy).

Put bluntly, the Durst Rho factories produce the strongest components and structure of any UV printer in the world. Other brands are “lightweights” in comparison.

Two new FLAAR Reports resulted from the one-week visit to the Durst Rho factories.

Inca Digital

Inca Digital is the company that manufacturers the Inca Spyder and Inca Columbia printers. These are sold by Sericol (now owned by Fujifilm). Inca Digital itself is owned by Dainippon Screen.

The sponsor for this visit to Cambridge, England was actually the German branch of Sun (Chemical), who sub-contract to Inca to build the Sun FastJet machine. So most of my day was concentrated on the FastJet. I appreciate that Inca also encouraged me to visit their factory (next door to where the Sun FastJet is manufactured).

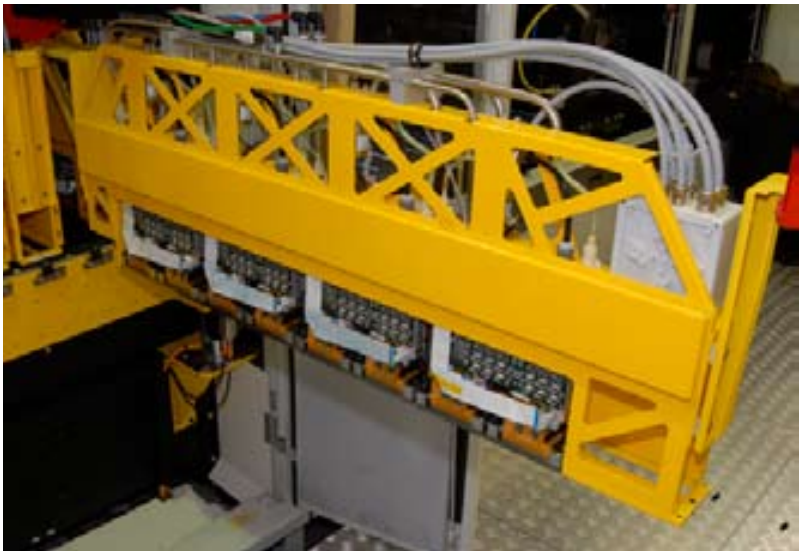
Since neither Sericol nor Inca are research sponsors, there were no publications that resulted from this visit. Our university preferred that research and reports be sponsored by industry, so this initiated our program of sponsored research (Durst, Gandinnovations, and now GCC, IP&I, Dilli, and other manufacturers).

Page-Array UV Printer Factory Visit

By late March we added this new UV printer factory visit. This was quite an experience, especially because this is a million-dollar UV printer with a page-array of printheads.

"Page-array" means that the printheads don't move; there are so many of them that they go across the entire width that the printer can do. Page-array is the new technology. Within two years you will find it in more desktop office printers, and $30,000 60" photo-quality printers. You can already get inkjet presses that use page-array technology.

There is now a separate report on this printer after our visit. Originally there was supposed to be a follow-up visit to a site with the FastJet installed. But since this visit was never arranged I estimated that the printer was not yet ready for a full inspection in-situ, so we are not yet able to issue any recommendations on the Sun FastJet.



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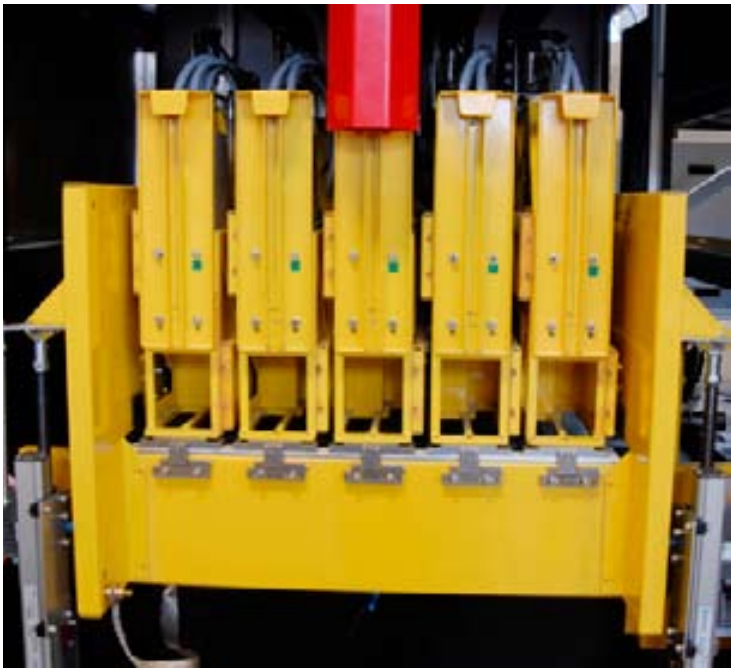


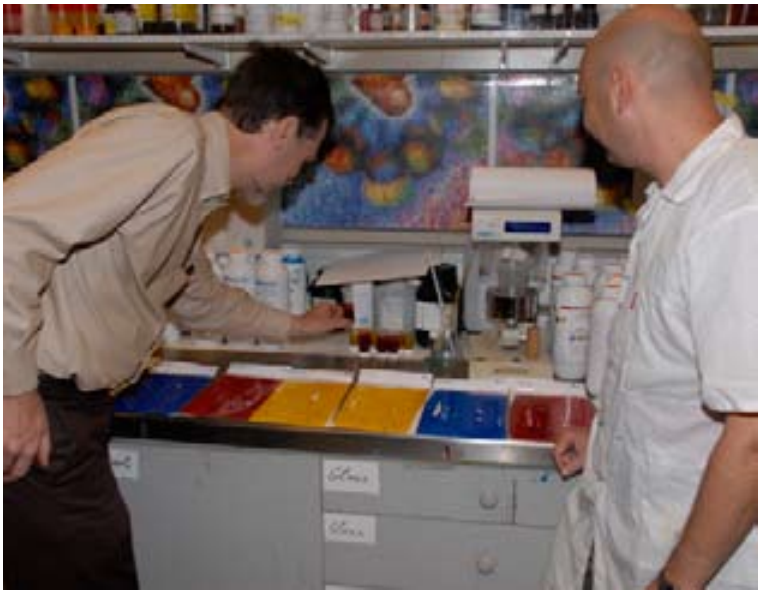
Initial Factory visit to NUR world headquarters

NUR Macroprinters was a leader in grand format solvent printers for years. Their BlueBoard and current Fresco III solvent printers are known for holding up for years of productive output. NUR has now for several years gone full force into UV-curable printing and was the first company to produce a production-class roll-to-roll UV printer.

Since their headquarters is far away not many people are familiar with the company other than their nice trade show booths. So when an opportunity was available, I went to Israel to learn about NUR, and their UV-curable inkjet printing hardware, software, and ink chemistry first hand. With my background in archaeology and history, visiting Israel was also of personal interest to me.

Here are some initial snapshots of the NUR factory. It is clean, well-organized, and clearly looks prosperous. Their main discussion was that they have more orders for new Tempo flatbeds and Expedio roll-to-roll than they can produce.

It is not appropriate to reveal or publish on their proprietary technology and UV ink chemistry, but one thing I can say clearly: my impression of NUR, as a company and as a family of products, was dramatically changed by being here an entire day, indeed far into the evening at a follow-up business dinner that night overlooking the Mediterranean Sea.



I learned a lot about their UV inks and why they don't use UV inks from Sun any more (Sun are not bad inks, but the rest of the story of why NUR's new inks are better is best left under NDA).

Being able to spend time, in a relaxed atmosphere, and meet the people behind the printers, is a huge asset for FLAAR as we continue to maintain our position as the #1 de facto international resource for comparative information on UV-curing inkjet printers.

After two inspections of NUR headquarters, R&D facilities and manufacturing plant, we can understand why HP bought them (several months later).

Even if a trade magazine had the time and staff to send to all the printer manufacturers, when you visit as a university professor you end up learning and experiencing more than if you are a journalist. Besides, to us at FLAAR, UV printers are not just a job; we don't write about these because some editor tells us an article is needed. We write about UV-curable printers because we have a passion for learning and for sharing our knowledge with our readers: we hope to surpass 300,000 readers on our solvent+UV pages this year. Last year we were about 270,000 readers on www.large-format-printers.org (if my memory still functions). Our other printer review sites, together, had close to a million readers in addition to the readers of our UV+solvent pages.

Here the inspection goes through the R&D facilities, in this case testing white ink and double-sided (including block-out materials). When you see how much is put into R&D you see why so many new versions of the Tempo and Expedio are being launched in 2007

In the factory you could see that the NUR Tempo as well as both the NUR Expedio 3200 and NUR Expedio 5000 are so popular that the factory has to work overtime

Other UV Printer Factory Visits

A factory visit makes it possible for FLAAR to accomplish the following:

- We can more easily write a FLAAR Reports on the printer, because we can learn more about its capabilities in the peace and quiet of a factory visit.
- It is possible to learn more about what makes a particular printer good when we can see inside. At a trade show you can't really see what makes a printer tick.
- A sloppy factory, sloppy welds, cheap components are easy to spot. But if the assembly is professional, you see high-tech quality (which is what we saw at Durst, Spühl, Gandinnovations, NUR, and Inca).

Trade show booths are rather hectic; it's a lot more practical to do a factory visit. Besides, if you go to the effort of flying all the way to the factory, then the manufacturer recognizes that you are a serious potential, and (hopefully) treats you accordingly.

Since our university does not provide travel funds, we rely on the manufacturer to provide airfare and hotel. So the factory visits tend to be with manufacturers that are general sponsors of our research programs. MacDermid ColorSpan and Gandinnovations would be examples (though being a sponsor is not a requirement; Grapo is not a sponsor, for example). For the major universities, for example Rochester Institute of Technology, their printing programs include sponsorship by manufacturers. The same is true of many other of the equally prominent and highly regarded printing programs at other universities: they have corporate sponsors. Indeed the programs that are not in the top tier often lack sponsors. Frankly without sponsorship it's not realistic to obtain all the training, experience, and access to the equipment.

For 2007 we accomplished additional factory visits (Infiniti and Teckwin in China, GCC in Taiwan, IP&I and then Dilli in Korea). These are in separate reports.

The manufacturer often asks FLAAR to provide consulting services, though this is not required. A factory visit is normally part of an evaluation project (to evaluate and write a review on one or more specific models).

and

UV-Curable Printers: Market Share, Market Potential,
and
Pros & Cons of Individual Brands and Models

Dr. Nicholas Hellmuth
FLAAR Digital Imaging Resource Center

FLAAR

A visit is a minimum of an entire day (not inside the factory, whew, no, most of the time is needed in the demo room). But we prefer two days+ (one day general familiarization, one day for each individual printer in the demo room). Mutoh Europe requested an entire week because there we undertook a planned project of evaluation and testing. Four FLAAR publications resulted plus mention in several trade magazines.

A site-visit is preferably part of a company familiarization visit (FLAAR gets to know the company; the company management get to know FLAAR and our programs).

If requested, we sign a Non-Disclosure Agreement (NDA) prior to entering the factory, so we can't report the intimate details of their 2008 generation of new technology, but we do have permission to document the features of their current printers in a way that no trade magazine or anyone else has made the effort to do. We are proud that FLAAR uses initiative to get out and bring back documentation so that print shops can have realistic and factual information.

And the factory staff, headquarters staff generally are very pleasantly surprised how much they learn from FLAAR when we are at their factory. That's why some visits are two or three days long or if only a day, then we get invited back year after year.

At a recent factory visit, I could not help but notice how many managers and business analysts from the company came to sit in on my PowerPoint presentation on the general state of the UV economy worldwide.

Dr. Hellmuth at Mutoh factory, Belgium, May 2007

Dr. Hellmuth at VUTEk factory, June 2007

Wasatch, Visit to their Main Headquarters

What to look for during a visit to a RIP software company

When I visited the international headquarters of BEST (RIP company) in Krefeld, Germany, on two occasions, I noticed they were growing and had many technically capable people. When I visited the USA headquarters and demo room of BEST outside Cincinnati, again I saw they had top people. Their US offices looked top notch.

When I visited the headquarters of another RIP company in Belgium, I saw a large building (a good start), but I noticed that 90% of the offices were completely empty. Indeed I found only about three or four employees still at work in the entire building. Naturally my evaluation of their RIP software suggested that they might not be able to provide much tech support in the future.

Dr. Nicholas Hellmuth with two managers of Wasatch at their world headquarters in Utah

The reason you see so many different printers at a RIP headquarters is that they need to fine-tune their RIP for each brand and model of wide-format printer. This is also why a testing institute needs to have diverse printers readily at hand if testing is part of their intended program.

About three weeks later this company went either bankrupt or otherwise was bought out by someone else.

Yet another year I visited the headquarters of Perfect Proof (ProofMaster RIP software) in Belgium. I saw a capable and dedicated crew. It was not a huge building like BEST, but you don't have to be big to be good. Size does not always matter. Perfect Proof is an excellent proofing RIP. The owner has decades of experience and knows ICC profiles inside out; indeed he knows them so well that he realizes there are more precise ways to handle color management.

Yet two other European RIP companies appear to be waning. One used to have a large trade show booth at all the major European trade shows. But now they don't have their own booth any more, or if so it's a lot smaller. And they no longer have a US office; their US distributor is not itself a RIP company; only a reseller. The other European RIP company also has a reseller as their representative in the US; very capable (I have been there), but not in themselves a RIP software company. In distinction ErgoSoft, also a European RIP company, has full-time RIP specialists as their management and tech support in the US.

When you visit the world headquarters for Wasatch, you can see they are a prosperous and growing company. Indeed Wasatch is the #3 or possibly the #2 RIP nowadays. This means they have the financial resources to invest in new products. So it should be no surprise that Wasatch was the first to produce variable data capability for wide-format inkjet printers.

Shiraz RIP, Visit to their Main Headquarters

World headquarters of AIT, the company that develops Shiraz RIP software for wide-format inkjet printers.

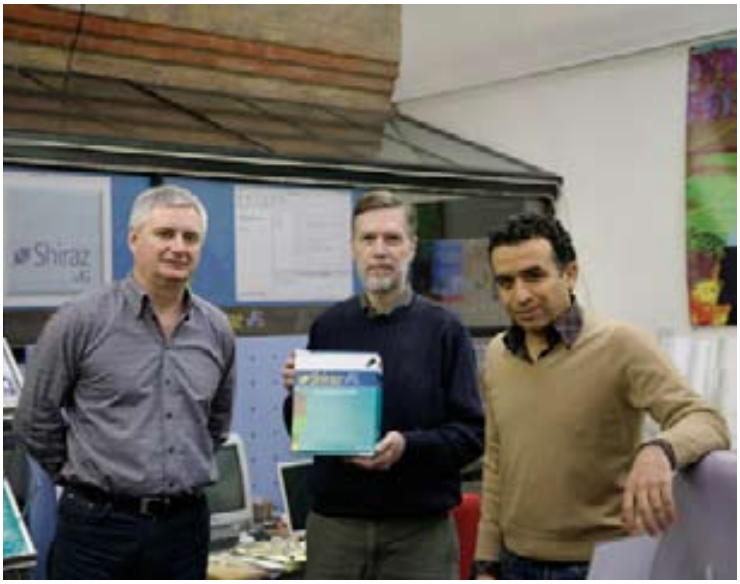
Their color management specialist is from Denmark and knows ICC color profiling from A to Z. The owners of the company that makes Shiraz RIP have been in pre-press for decades and know all aspects of this industry. They don't have a major presence in the US, but are a respected software provider in the UK and throughout Europe and the Middle East.

When you visit the Shiraz headquarters you know you are dealing with a company that is experienced, capable, successful, and will be around for a long time.

The RIP is the brains that runs your wide-format or grand-format printer, so it is worthwhile selecting a RIP that has capable people standing behind it. The best way to learn who is standing there is to visit the international headquarters. AIT (Applied Image Technology) is the company that makes Shiraz RIP software.

I find it well worthwhile to visit the headquarters of RIP software companies. You get a broader perspective than you can see at a trade show. Besides, in their headquarters you can quietly sit down and test their software. A successful RIP company has all the major printers all in their demo room (except obviously the huge grand format solvent and UV printers since these printers work best when kept running 10 hours a day every day).

To test products you need one of every major printer.



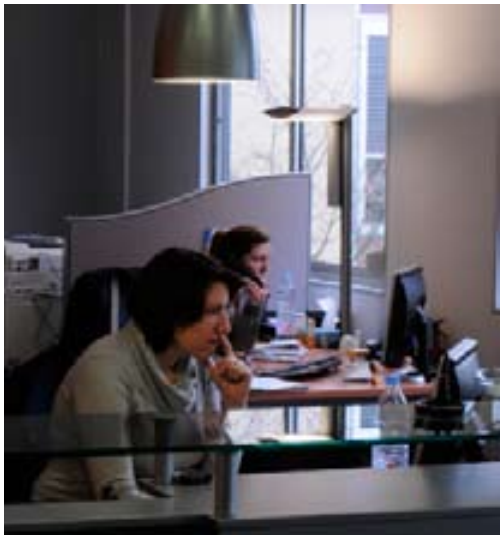
BGSU professor with two of the owners of AIT/Shiraz.

You notice when a RIP company is competent, when you see capable specialists on their staff. Here, for example, is a full-time color management at Shiraz headquarters

Again, you judge a RIP company by their headquarters facilities: here is just one out of several rows of the printers that can be managed by Shiraz RIP software. Based on our inspection of Shiraz over several days, we rate them as an internationally capable software development company.

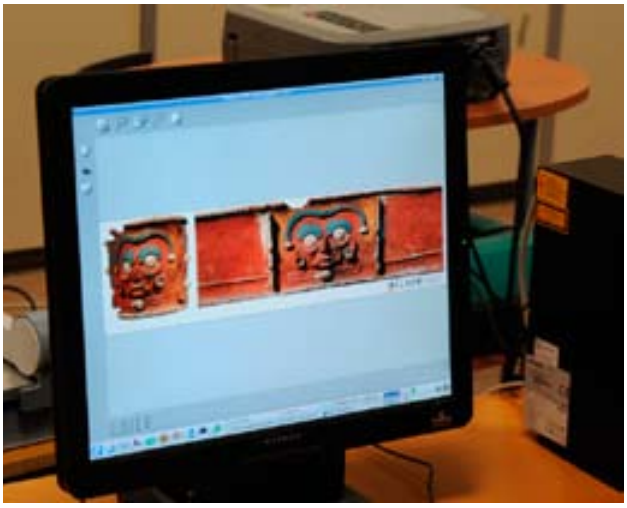
Caldera RIP software: Visit to their World Headquarters

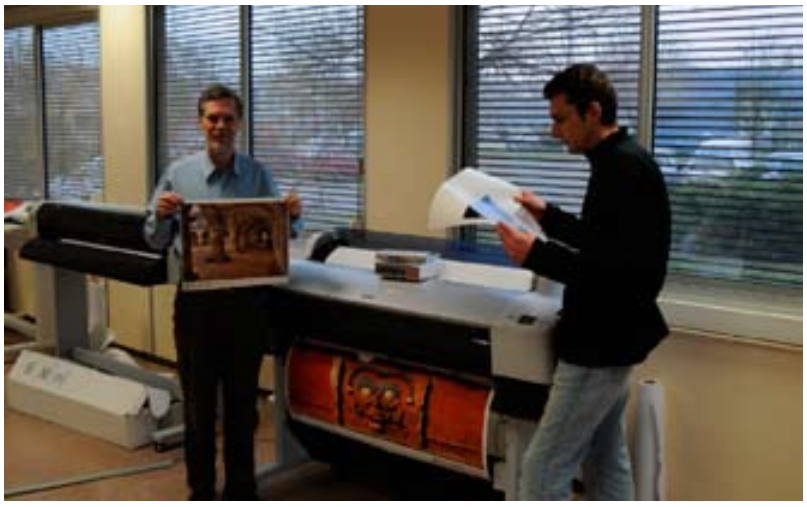
Ten years ago our own short-list of RIP manufacturers was Onyx, Wasatch, and PosterJet. But PosterJet has waned, has as ColorGate. ScanvecAmiable became “SAI” and shrank in size (measured by trade show booth size and frequence of which trade shows they are present or absent).



If you judge by growth of installed base, and by frequency of presence at major international trade shows, Caldera is now in the Top 10 for sure, and heading for being in the Top 5. Whether in China or Germany, Italy or Spain, or across the US, if you visit a major trade show for grand format solvent or UV flatbed printers, you will probably see staff from Caldera RIP.

A new FLAAR Report has been issued on the Caldera RIP as a result of the two-day inspection and testing of the Caldera RIP software.





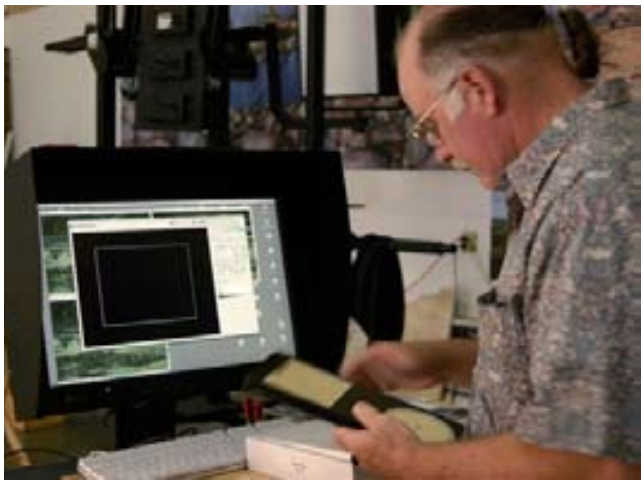
BetterLight, Photographic Equipment Factory Visit

This is obviously not a printer factory, but it is the place that the most sophisticated large format digital camera backs are designed and manufactured. BetterLight is the leading brand of tri-linear scanning backs for large format cameras.

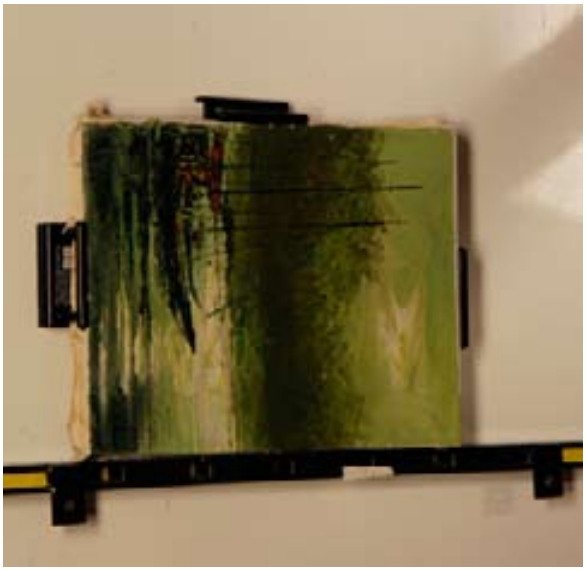
Here you can meet Mike Collette, owner and developer of the camera, and Robin D. Myers, their color management specialist. He was part of the scientific team of Apple Computers when they first did their color management.

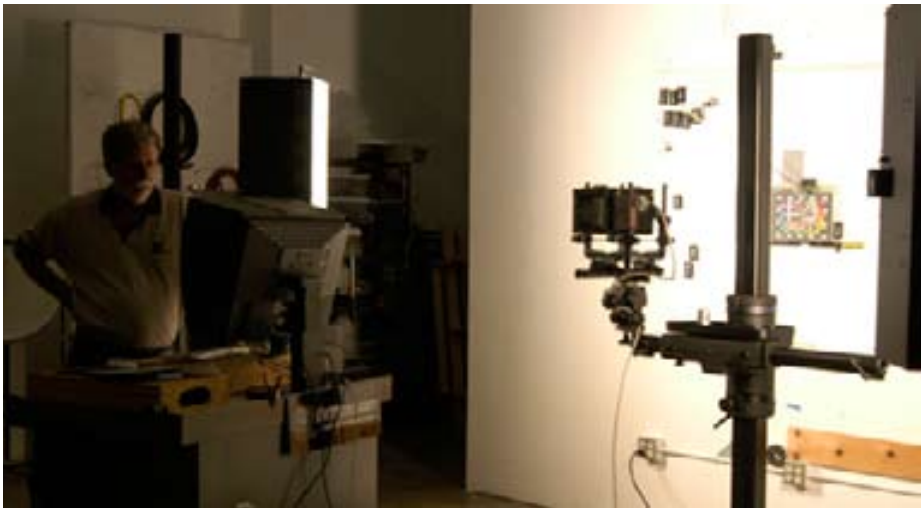
In the headquarters of BetterLight you will also find David Christensen, North Light Products. Their digital fluorescent lights, their SunSpots (these are the ones we have), and their HID (High Intensity Discharge lights; the ones we would like to have but as a non-profit institute we don't have the funding) are all state of the art. Christenson works together with BetterLight both in the factory and at trade shows.

When funds are available we try to send pertinent personnel other than Hellmuth for training. Here we have sent Eduardo Sacayon for training. He was selected for several reasons: he has already demonstrated the ability to learn how to use all the sophisticated cameras and software that we have made available to him. Plus, he has worked for FLAAR already for over 5 years and has expressed interest in continuing with us. So it is understandable that we in return are keen to invest in his further training. Eduardo is in charge of evaluation and educational projects at FLAAR's office in Guatemala. He is a graduate student at Universidad San Carlos, Guatemala City.



The circumferential rollout on the wall of the headquarters of BetterLight is taken by the FLAAR team in Guatemala. Hellmuth has been a beta-tester for Better Light since 1997, before coming to BGSU.





BetterLight testing facilities, Silicon Valley area, California.

MegaVision, Photographic Equipment Factory Visit

MegaVision is one of about six remaining manufacturers of CCD backs for medium format cameras (for Hasselblad, Rollei, Mamiya, etc). MegaVision is the only one of these six manufacturers that also makes a dedicated black-and-white digital back for a medium format camera. We have borrowed one twice for testing. Very impressive because with no Bayer Pattern and no moiré filter, you get a crisper sharper image.

Xerox iGen3 Factory Visit & Familiarization

We started evaluating dye-transfer printers in 1997. Next we evaluated A3-size (11x17" tabloid size) laser toner printers during 1999-2001. Our first wide format inkjet evaluation was an Encad NovaJet Pro in 1998-1999. We received our first HP printer (2800cp) circa 2000.

By 2003 we had moved away from stagnated laser toner technology and were firmly into wide format inkjet. We began looking at UV-cured printers at DRUPA 2000 and Photokina 2000 and moved full-time into covering UV-cured flatbed printers at DRUPA 2004.

During 2004 we also began to look closely at variable-data short run digital presses. Nicholas won the Kodak DRUPA 2004 digital press prize which was a trip to the Kodak technology center at the Athens Summer Olympics that year (ticket for two, very nice). There it was possible to learn about Kodak Versamark and Kodak nexPress.

By 2005 Xerox noticed our presence and invited five of us to their factory and demo center in Rochester to inspect the iGen3. We have a separate report on this visit, so here we show just a few sample pictures. Obviously most of the actual assembly was off-limits to photography, but what counts is that we spent hours in the factory, with each technical manager explaining his or her part of the overall system.

Very impressive, not only the variable data short run machine, but impressive how Xerox skillfully arranged the visit.

As an added benefit, as a result of this trip a BGSU student received multiple job offers.

Site-Visit Case Studies

There are three kinds of special ways to learn about UV printers,

- one is factory visits,
- another is a site-visit case study
- the third manner is trade show visits.

A site-visit means that FLAAR goes into a print shop, franchise sign shop, major photo lab, digital printing company, screen printing company, etc and inspects how their UV-curable flatbed printer actually functions.

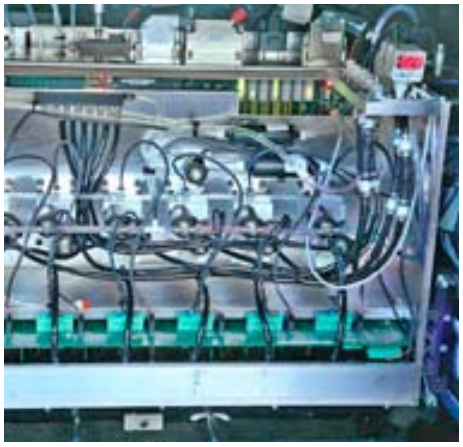
Or, in the case of some printers, we obtain a precise list of how their parts wear out, the combo-belt causes skew, the UV lamps are too hot, the ink does not adhere.

In most (but not all cases), the printers work just fine. In some instances it turns out that the printer brand they selected is better than they anticipated.

Printshop owners indicate whether their printers are making money, or whether they wish they had bought another brand instead.

It costs us an average of $1000 to fly to these locations, hotel, rental car, then all the costs of preparing the full-color PDFs (total between $4300 and $4800 for a site-visit and report preparation costs). So our institute appreciates it when readers consider purchasing these reports from [www.wide-format-printers.net.](http://www.wide-format-printers.net)

Lisbon, Portugal. Gandinnovations site-visit case study



St. Louis, MO, US. Vutek PressVu 200/600 site-visit case study

Athens, Greece. Luscher JetPrint 3530 UV site-visit case study

St. Louis, MO, US. Infiniti-UV site-visit case study

Inspecting UV-Cured Printers at Trade Shows

The third manner of learning about UV-curing wide-format inkjet printers is by visiting trade shows. FLAAR offers a completely free report that lists all the trade shows and suggests which ones are worthwhile visiting. We then offer free trade show summaries for individual trade shows by year (as separate reports, such as DRUPA 2004, or whatever). To attend a trade show in foreign countries cost us about $3,000 and even when the show is in Orlando the hotel bills, rental car and time devoted to studying the printers adds up. So for some of the trade show reports, especially on UV flatbed printers, we do ask for a contribution for the resulting report, since otherwise it would not be possible to provide this documentation.

Trade show reports are lists of what printers appeared, by brand, model, and classification (what kind of ink, what size class, etc). If you need extensive discussions in detail of any particular printer, then you also would need the one-by-one FLAAR Reports on each individual model. Where trade show reports are especially helpful is to find out when (what year) each model was introduced so you can learn whether you are buying cutting edge, bleeding edge, or old-fashioned technology. Plus trade show reports are a good way to obtain a general overview of the flatbed UV printer industry.

UV printers have been shown at trade shows since about 1999, with the most early UV printers being at DRUPA 2000. Naturally since then even more UV printers have been exhibited.

Graphics of the Americas, 2007

Dr. Hellmuth studies many aspects of the UV-curable printers displayed at trade shows. Here, holding samples of the Legget&Platt Virtu HD8 at ISA 2008.

Dr. Hellmuth examines the FLORA F1-180UV at ISA 07, Las Vegas , Nevada, US.

Dr. Hellmuth examined samples of the Gerber ion^{x}, one of the most talked-about printers at ISA 08. Orlando, Florida.

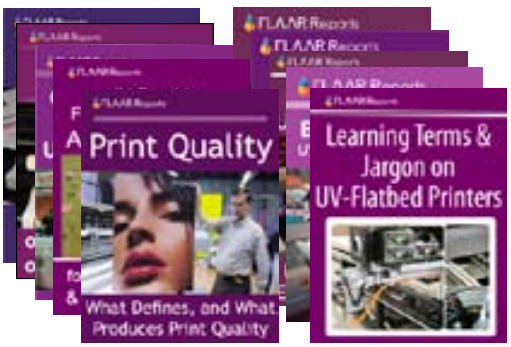
Dr. Hellmuth holds a sample printed on with the VUTEk QS2000 at Graphics of the Americas, 2007 Miami, Florida, US.

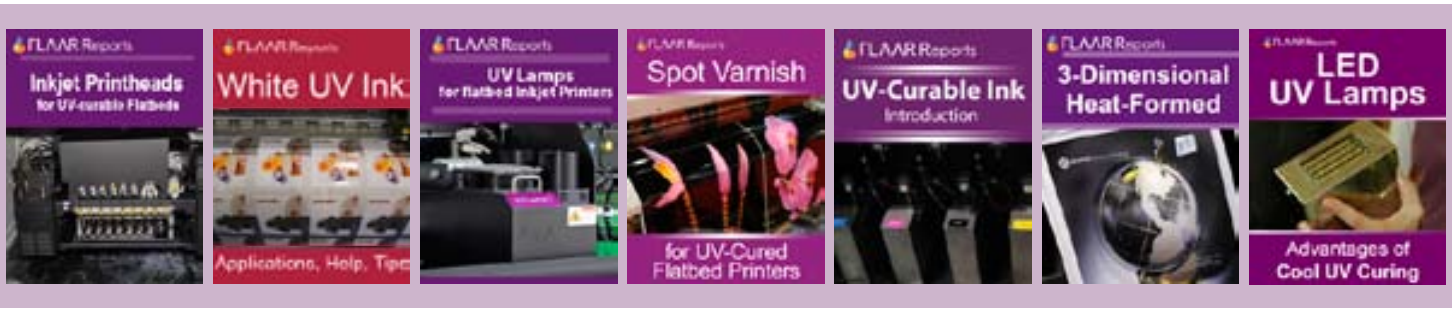
Since FLAAR Reports are read around the world, we do our best to inspect UV-printers at trade shows in as many countries as possible

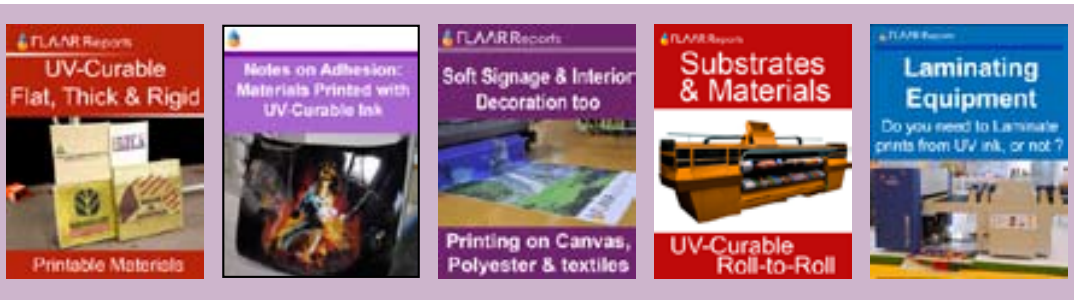
These photographs show FLAAR presence at trade shows in the US. However, Dr. Hellmuth attends the most important trade shows around the world, in countries such as Germany (DRUPA, FESPA), Italy (Viscom), Spain (Viscom, Sign), Dubai (Sign Dubai), etc.

New FLAAR Series of Introductions to UV-Cured Inkjet Printers

FLAAR has a new program of sponsored research, an idea based on how most major universities and educational institutes fund their research projects. So currently FLAAR has a goal of 25 introductory publications on UV-curable printers, to introduce UV-cured ink chemistry and flatbed, hybrid, combo, and roll-to-roll UV technology to printshop owners and managers worldwide (who may be still using solvent or water-based ink).







During DRUPA 2008 we will seek sponsors for each of these topics and will launch the reports one by one beginning by late June.

Most recently updated June 2008.
First Issued April 2007. Updated May 2007.

Evaluations

Site-Visit Case Studies

These reports and more are available at www.wide-format-printers.net

Reality Check

Being at a university absolutely 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 that 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, since we are not dependent on sales commissions we can openly list the glitches and defects of those printers that have an occasional problem.

FLAAR and the university have corporate sponsors but FLAAR web sites do not accept advertising, so we don't have to kowtow to resellers or manufacturers. We respect their experience and opinion, but we prefer to utilize our own common sense, our in-house experiences, the results from site-visit case studies, and comments from the more than 49,000 of our many readers who have shared their experiences with us via e-mail (the Survey Forms).

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Update Policy

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. To obtain the next update write ReaderService@FLAAR.org.

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.

Citing and Crediting

A license from FLAAR is required to use any material whatsoever from our reports in any commercial advertisement or PR Release.

If you intend to quote any portion of a FLAAR review in a PowerPoint presentation, if this is in reference to any product that your company sells or promotes, then it would be appropriate to ask us first. FLAAR reports are being updated every month sometimes, and our comment on that product may have been revised as we learned more about the product from end users. Also, we noticed that one company cited the single favorable comment we made on one nice aspect of their printer, but neglected to cite the rest of the review which pointed out the features of the printer which did not do so well. For them to correct this error after the fact is rather embarrassing. So it is safer to ask-before-you-quote a FLAAR review on your product.

The material in this report is not only copyright, it is also based on years of research. Therefore if you cite or quote a pertinent section, please provide a proper credit, which would be minimally "Nicholas Hellmuth, year, www.FLAAR.org." If the quote is more than a few words then academic tradition would expect that a footnote or entry in your bibliography would reference the complete title. Publisher would be www.FLAAR.org.

If you intend to quote any portion of a FLAAR review in a PowerPoint presentation, if this is in reference to any product that your company sells or promotes, then it would be appropriate to license the report or otherwise notify us in advance. FLAAR reports are being updated every week sometimes, and our comment on that product may have been revised as we learned more about the product from end users. Also, we noticed that one company cited the single favorable comment we made on one nice aspect of their printer, but neglected to cite the rest of the review which pointed out the features of the printer which did not do so well. For them to correct this error after the fact is rather embarrassing. So it is safer to ask-before-you-quote a FLAAR review on your product.

Legal notice

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 workaround. 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, usually 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 courses 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.

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.

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 laminating 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.

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.

And 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.

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.

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.

Acknowledgements

Fortunately the university covers some of the operating costs of FLAAR on their campus. Thus we do not really have much incentive to pocket hush money from producers of lousy products. 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 is fairly evident rather quickly.

With 12 employees the funding has to come from somewhere, so although the universities cover the core expenses, 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 incapabilities 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 and for funds to allow us to attend all major international trade shows, which are ideal locations for us to gather information. We thank Drytac, Sun LLC, Bordeaux Digital PrintInk, Mutoh Europe, NUR (now part of HP), IP&I, Dilli, Yuhan-Kimberly, VUTEk and Zund 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. Currently our reports on lamination tips are sponsored by Drytac and our publications on eco-solvent ink printers are sponsored by Mutoh Europe. Now (in 2007), we are seeking corporate sponsorship so we can gradually return to making at least 20% of our publications free to our readers.

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 350,000+ 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.

ColorSpan, Grapo, IP&I, Mutoh, Dilli, GCC, NUR, Sun, Teckwin, VUTEk, Xerox, Yuhan-Kimberly, Zund have each brought FLAAR staff to their headquarters and printer factories. Bordeaux 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 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 are universities employees (as is 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 Heweltt-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 primarily 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 two manufacturers of piezo printers (Epson 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.

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 university 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.

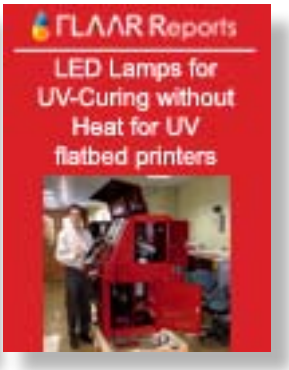
A modest portion of our income comes from our readers who purchase the FLAAR series. All income helps continue our tradition of independent evaluations and reviews of inkjet printers, RIPs, media, and inks.

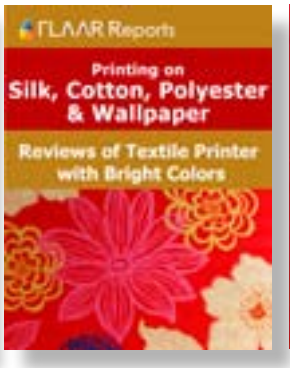
FLAAR Reports

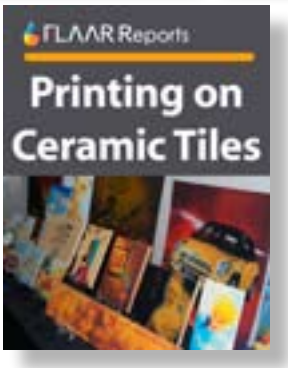
Free Sample Publications

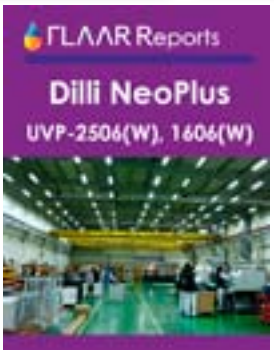
FLAAR Reports

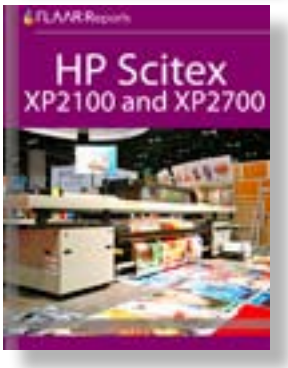
You can find these and more reports at: www.wide-format-printers.NET

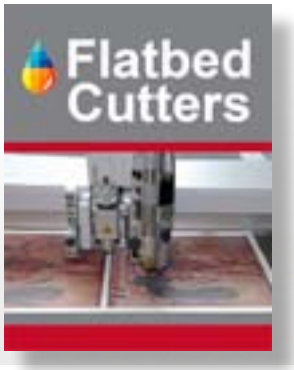


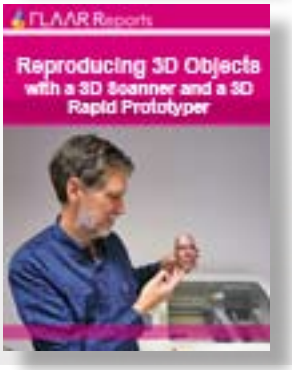












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These

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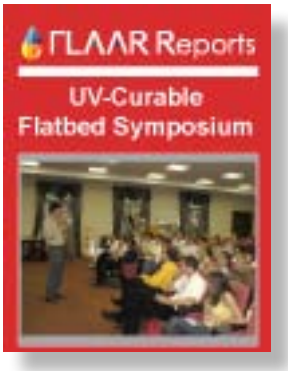
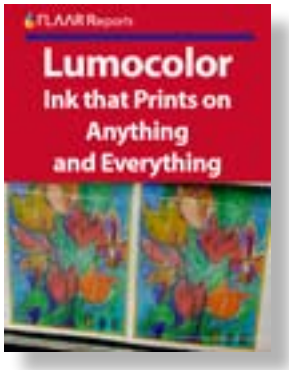
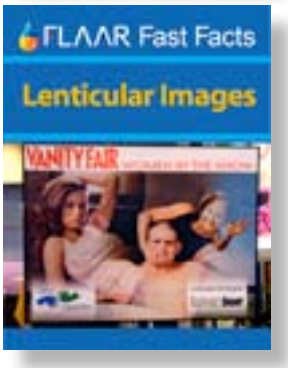
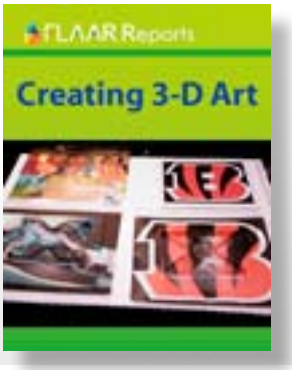
can be obtained at no cost by filling out the Survey-Inquiry Form, which you can find by clicking on the "Access to Survey for Free FLAAR Reports" link on www.wide-format-printers.NET









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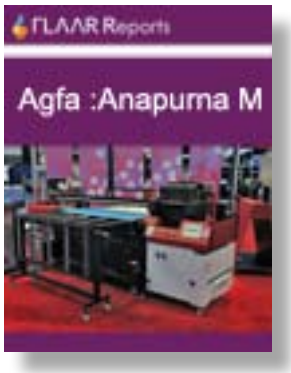

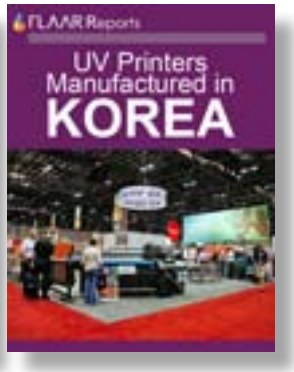

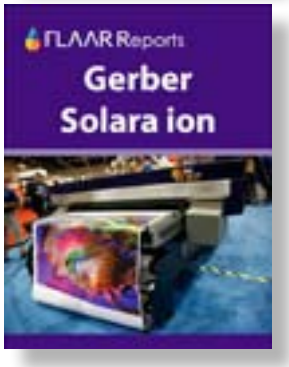

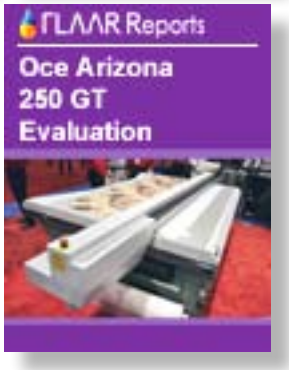

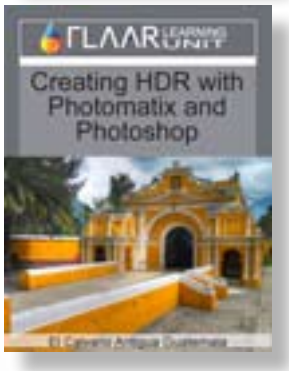

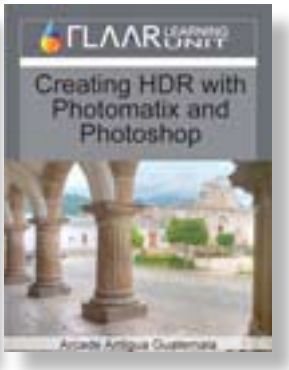

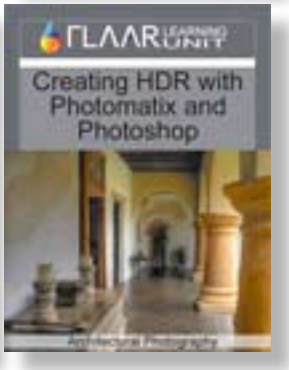

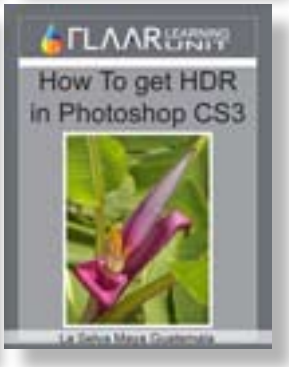

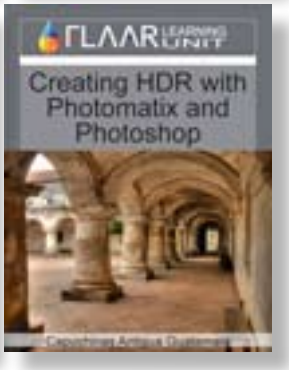

Each month Dr Nicholas Hellmuth travels around the world to investigate and learn more about the new technology.

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