Oil-Based Ink

Wide Format Printers for outdoor use without lamination
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**Introduction: Our Interest in Oil-Based Ink Printers**

One of the many goals of FLAAR is to show the potential of the “room of the future” in which everything in the room is decorated with, or printed with, an inkjet printer. Digitally printed wallpaper is one of the must-have’s for such a digitally decorated room. Up until now wallpaper has been printed with solvent ink. However the downside of solvent ink is the outgassing of the ink and the unpleasant smell of the vinyl too.

At either SGIA or ISA trade show in 2002, a Japanese wallpaper company exhibited the XES ColorgrafX X2 as an ideal printer for wallpaper. It struck me that an oil-based result may not have the same unhealthy odor as that of vinyl and solvent ink. Hence my interest in oil-based printers grew somewhat. The present FLAAR Fast Facts is a resulting brief introduction to the pros and cons of the three brands of oil-based wide format inkjet printer: DGI + Dilli, Seiko, and XES.

Oil-based ink printers is one of several wide format inkjet technologies that we are gathering information on. Oil-based inks are not very popular but that may be due partially to lack of proper education. For example, I myself do not know the chemical trade offs in terms of fumes as compared with eco-solvent or lite-solvent inks. No one has gone to the effort to publish the facts on any of this. FLAAR is not a medical research institute, and we are so busy handling the other aspects that we do not intend to include chemistry in our reports. You would have to dissect the MSDS for oil-(petroleum) based ink. We know it generally contains ISOBAR.

At least one of the oil-based ink printers is reportedly manufactured by Olympus; I believe it is the XES series. Olympus itself does not sell any such printer in wide format size under its own name as far as we know. However Olympus has recently introduced a copier-sized (letter size) oil-based inkjet office printer in Japan. This printer is not yet available in the USA or Europe. I did not notice this unusual hybrid inkjet copier during two weeks of DRUPA trade show in Duesseldorf in May 2004, but with thousands of exhibits in 17 giant halls it was a challenge to see what was inside every exhibit booth.

**Large format printers using Oil-based Ink**

Oil-based ink printers were always a rarity. XES and Seiko were really the only companies with a viable product. Of these XES appeared to close shop under that name shortly before Christmas 2002. There are conflicting reports on what is going on. We comment later in this report. Korean companies DGI and Dilli share a model but it is not widely sold in America.

The oil carrier of the ink is evidently not able to evaporate. This has one very beneficial feature: the ink does not dry out inside the nozzle. So the nozzles do not get clogged as much as if you use solvent ink. Solvent ink printers have to constantly spit ink and be purged, wiped and clean to keep the nozzles clear of dehydrated ink, so to speak.

The downside of oil-based ink is precisely the same feature that is its benefit in the printhead. The ink does not dry out on or inside the media any more than it dries on or inside the printhead. The oil vehicle (the liquid that carries the ink) only sort of disappears into the fibers of the paper; but it is still there, under the surface, forever. As a result, oil-based inks, especially previous generations, have a
reputation for not always laminating well. The laminate cannot always stick well onto the oily surface. Oil-based printer ads claim their new generation of inks and media laminate just fine, but we would need to test that. Here is a perfect case where a university-based testing institute could have rendered a service. However, we do not yet presently have an oil-based printer. The nineteen inkjet printers we do have are all water-based.

Despite traditional pros and cons, in today’s competitive workplace a fast printer with non-smudging ink alone is a benefit. Thermal printhead technology, especially ColorSpan and Encad, lay down so much ink that they easily smudge on some media. Encad prints take hours to dry. In distinction prints from the XES ColorgrafX X2 are dry to the touch immediately (it is wet only inside the media; the surface itself is dry). The oil does not really evaporate very much, so a lot will stay on and within the paper, even soaking through to the other side. This means that although the surface feels dry to the touch, in reality the oil-based ink never really dries down inside the media. Nonetheless, a smudge-free surface is a notable advantage if you need to pack and ship the prints immediately after printing (to meet a deadline). Otherwise, prints from many more popular printers may require hours, or really up to overnight, to dry before they don’t smudge as much. And yes, you can laminate most other prints more reliably... but you have to wait for the ink to dry from an Encad, ColorSpan, or HP before you can initiate the lamination. As with every make and model, there are pros, and cons, of every technology.

Seiko Info Tech

The original Seiko inkjet printers, vintage 2000

Since autumn 2003 the newer Seiko oil-based models are greatly improved. However many of the older models of this same brand are widely available as used printers, so it is necessary to review them as well.

Seiko makes one of the few oil-based wide format printers, the IP-4500 and 4010 models. I first saw these printers, and their splotchy output, at DRUPA 2000. These are 6 color, Xaar piezo heads and claim 720 dpi. However that appears to be a false claim (especially for year 2000). Although the brochure screams out “highest speed in the world in class” it did not seem all that fast in real life. But maybe they were comparing it to their sister printer from the other Seiko company, Epson, which at DRUPA 2000 was the slowest large format printer on the planet (they are not as slow today). The Seiko brochure also touts “super high image quality.” That is nonsense. The image quality from six feet away is okay, but up close it has a “super low quality.” Indeed the original Seiko model, the XES Xerox Xpress, and the Fuji Hunt (Brady) printer consistently won the FLAAR award at every trade show for “worst output of a wide format printer.” The Seiko output is, however, not grainy like the Fuji or Xerox, it is just featureless. The crisp detail is just not present. Both the Xerox and the Seiko use piezo printheads with Xaar components.

The competition at DRUPA 2000 for the original Seiko was just as bad if not worse. The first generation XES Xpress was plagued by the same dismal output as that of the first generation Seiko. The second generation XES ColorgrafX X2 was sufficiently improved that Hellmuth gave it his award for “best improvement from one model to another” at CeBIT tradeshow 2001 in Germany.
Newer, improved Seiko IP-4500 Mk-II and 4010 Mk-II

We now include fresh information on wide format printers we inspected during three intensive days at the Seybold San Francisco 2002 trade show and then at the Photokina 2002 trade show. For example, at SGIA, late October 2002, we saw the new improved Seiko. At last the images look bearable. The XES may still have a tad better quality, but Seiko is catching up as we saw at ISA ‘03.

With all that said and done, if you need an oil-based print, then you may need a Seiko printer. It at least does not cost as much as the over-priced Xerox Xpress and the Seiko Mk-II is a newer technology. Besides, most signs are viewed at a distance. Just be sure your signs are high up and not accessible to close viewing distance. And be sure your competition does not use a ColorSpan or Hewlett-Packard. Even an Encad produces better photographic quality.

Seiko printers are sold by Oce at least in the United Kingdom. Our comments on the current improved generation of Seiko printers are in our report on SGIA ‘03.

Raster Graphics

PiezoPrint 5000
This printer, introduced in 1997, used an oil-based ink. It is not often stated when this printer was withdrawn from the market.

XES, Xerox Engineering Systems

In the world of wide format inkjet, Xerox has just one single product line, using oil-based inks. Their XES oil-based Xpress 54 model inkjet was very, very costly and yet of the lowest quality. They charged $7,000 for their hardware RIP, the identical hardware RIP that everyone else tries to charge $4500 for (yet many companies are unable to sell even at that price since all the better software RIPS costs under $3000 and offer more options)

A RIP for a single printer should cost about $1,200 to $1,800; most cost in the $2400 to $3200 range. Anything over $1500 should be a full-featured RIP. A lite RIP is not worth more than $995. So if the RIP is priced at $7,000, or even at $3,500, check out your other options.
The XES printer itself had a high price tag. You can buy two or even three printers from Canon, Encad, HP, or ColorSpan for the same price as a single XES. Both or all of these other printers can be run by a single RIP (if you read the FLAAR Reports on RIPs and find out which RIPs can run multiple printers simultaneously). If you need to print 500 copies of a poster, which printer is more economical? Having the flexibility of multiple thermal printhead printers (Canon, ColorSpan, Encad or HP) or locked into a single oil-based printer (Seiko or XES)?

In other words, XES advertising claims you should buy their printer because it is faster. But they fail to state that the extra speed is correspondingly more expensive than the competition. The fair way would be to show cost-per-speed-unit. You might then find out that a Canon or ColorSpan was just as fast if you factor cost into the equation (again, that two or three Canon printers may cost the same as one single XES ColorgrafX X2). Xerox is very coy about prices; they do not reveal the price until you telephone them, nor do their dealers (at least the dealer we looked at).

**XES Xpress 54 and related models**

The reason we discuss printers such as the XES Xpress is because Xerox produced thousands of these printers and hundreds of them are still being offered used. People who are shopping for cheap wide format printers on ebay seek to have tips on whether or not to purchase various brands. So even for older models such as the Xerox Xpress it is necessary to maintain evaluations.

The Xerox Xpress printer I saw at Seybold three years ago had the worst quality of any printer at the show, and yet it was one of the more expensive models. They use MIT Xaar piezo heads, the lowest dpi on the market. Even a 4-year old Encad printer (long obsolete) can produce better quality at its 300 dpi than the most expensive Xerox large format printer. Although oil-based ink may be needed for certain, special applications, but ugh, what grainy dot structure.

This discussion of the Xpress is also based on visiting an experienced photo lab in Mexico City who had long and unsatisfactory experience with the Xpress. They junked theirs; said it was an unfortunate purchase.

We continue to receive e-mails from people who own the Xerox Xpress who indicate that they wish to get rid of them and get something better. We are thus trying to figure out why they are so unpopular since every printer does something well. And no matter how many faults a particular printer has, lots of people will like them nonetheless (usually because they do not know or have experience with the printers that are much better).

We did, however, find two people who liked their Xerox Xpress, yet we met the owner of a company in Mexico who had more realistic impressions of XES products. He said that between the excessive cost and poor quality, this printer had not been a clever choice for his company. He replaced it with a Hewlett-Packard 5000 and was much happier.

If you were considering the Xerox Xpress as a printer for CAD or GIS, today there are more modern, up-to-date technologies (including the newer ColorgrafX X2 printer from XES itself or the new Encad CAD printer).
**XES ColorgrafX X2**

XES introduced their ColorgrafX X2 to replace the Xpress. The ColorgrafX X2 was improved in most respects over the ill-fated Xpress. The output is better than that of any traditional solvent-ink printer of two years ago, and much, much faster than any Mimaki or Roland retrofitted with solvent inks. Outdoor longevity is in the order of 6 months without lamination (oil-based inks do not always laminate very well anyway).

But XES did not fully succeed getting the message out that the ColorgrafX X2 did not have the same problems as the earlier Xpress. Limited paper selections for oil ink, unrealistic ad claims, excessive pricing of the printer together with unreasonable triple-pricing on the RIP combined with lack of mainstream acceptance resulted in this entire wide format printer arm of Xerox being in the doldrums. I did not see them at tradeshows in mid-2003.

Other competition for oil-based printers is that in the last two years the quality of the Arizona grand format solvent ink printers and the Vutek counterparts has advanced. So today, in many respects, the output from an Oce Arizona, Mimaki JV3, and most Vutek printers is better than that of any oil-based printer. The use of Spectra printheads on the grand format solvent ink printers may be the reason for their good quality.

Also realize also that media for the XES printers may be costly because few companies make products for oil-based printers. The RIP is overpriced and everything to do with the printer is expensive. But it’s fast and the quality is better than the Gerber Orion and Mutoh Tomahawk/Albatros. The main competition would be with the Arizona printers or the new Mimaki JV3, which print on economical vinyl.

On the positive side of XES, all their personnel and managers, both in Germany and the USA, are capable and very loyal to their company and its products. I regret that I am not yet able to share their enthusiasm. Two years ago, the XES was of a better quality than almost all solvent ink printers. Yet back in the autumn of 2002, the solvent ink printers with Spectra heads had equaled or even surpassed the output of the Xerox with its Xaar heads. Plus the solvent ink printers today are faster and their media lasts three to five years outdoors versus six months for XES. Since 2003, printers such as the Mimaki JV3 give durable solvent ink output at a $30,000 price range.

However, beauty is in the eye of the beholder. Xaar heads are industry standards for many brands, so they must have their benefits. Maybe it is the oil medium and not the printhead. Viewing distance, personal taste, and what your client needs and expects are all factors as well. In some instances, an XES printer may be okay or even preferred. However in other instances, you may have better productivity through diversity with a Mimaki JV3 for considerably less price. Or, for roughly the same price as a single XES you could get four Encads or four HP 5000 printers or two ColorSpan 72" printers. Plenty of water-resistant media is available for the HP and ColorSpan (from IJ Technologies, St Louis, Missouri). We had a print from their Dura Duck media in our shower test for six months and still could not wash all the ink off their media (pigmented inks printed with an HP 5000ps). So ask yourself whether you really need the downsides of oil-based ink (splotchy looking output, poor range of media choices, etc). Oil never dries completely. The oil just moves into the media where you cannot see or feel it. No tests were ever widely published, that I know of, to see whether bleed continued to occur from such a liquid medium over time.
Best strategy is to locate other print shops: ask what printers they have. See how each printer really functions in its actual environment. If you locate other sign shops or print facilities with XES ColorGrafx X2 and they like that printer, and if they have practical experience with other printers for realistic comparison, then go for the XES solution. We know print shops with multiple XES ColorGrafx X2 printers who absolutely love the output.

Our test also reveals a truism: do not depend on the output that you see at a tradeshow. Do not make your decision of what printer to purchase based on the sample prints provided by the manufacturer either.

The only output which counts is your own images and the images of your clients. If these look as beautiful as tradeshow prints, then that is meaningful. But the usual experience is that prints at tradeshows have been tweaked to look spectacular. When you have the same printer in your own sign shop, the results with your own images may be disappointing. The exact opposite has also happened: terrible results by the people in a tradeshow booth, when we know the file is fine, and the original image is outstanding.

The above reality check is why FLAAR bases its evaluations on printers in-house in our own facilities at two universities. So far, we have eighteen printers with which we have learned to produce outstanding output. No oil-based printers in sight. However, if an oil-based printer ever should land in our facility in the future, the university printing and color management staff will be able to reveal its capabilities in the real world, which count much more than what is displayed at a tradeshow booth. Unfortunately perhaps XES was unsure whether they wanted us to look more closely at their printer, so they never sent one. Too bad, surely the evaluators at the university could have found its redeeming capabilities. But if the manufacturer decides not to send one, we have no way to find out what the printer can actually do. That in turn means that 25,000 buyers of inkjet printers a month don’t have an opportunity to learn the details of the printer in action. Too bad, since Xerox is an icon of American companies.

Another notable aspect of the XES printer is that calibration can take between 4 hours and an entire day. I will credit the XES technical staff with total honesty in this respect. Perhaps you have to get the system all cozy warm so the oil works optimally. Let’s just hope that you don’t have to calibrate very often, since the calibration gobbles up “six meters of media.” That’s 18 feet. I too complain about the Hewlett-Packard DesignJet being a media-hog when it calibrates, but it’s less than 3 feet, so considerably less than the Xerox. I also find the ColorSpan DisplayMaker XII a media guzzler in doing its calibrations. Nonetheless, the HP and ColorSpan only take a few minutes.

You also need to check the media take-up roll and see how it winds up the media, especially if you intend subsequently to feed the media off that same roll into a laminator.

The DPI of the XES is claimed to be 720 at 16 passes. That is indeed an impressive number of passes (translates into a longer slower print time). It was unclear whether that was software-DPI or the true dpi of the heads (which elsewhere tend to be 360 dpi pumped up via software or advertising estimates to 720). Again, as we get more details we will update and revise our report. If it takes 16 passes to reach 720 dpi, it is more likely that the true dpi is 360 or less.
Another downside of oil-based inks with Xaar heads is a very heavy grain pattern and imprecise focus at the top speed. Seiko has the same problem with more or less comparable oil-based inks and comparable Xaar printheads. But that is the price you pay for speed. If you want the quality of an Epson 10000 then the output is slower than a tortoise (except if you opt for the ColorSpan Mach 12, where you get good speed as well as top quality).

Two models of the ColorgrafX X2 exist: the narrower printer has software for CAD and GIS. The wider model is aimed at graphic design. But you can get five 24” HP 800 printers for graphic design at the price of the wider model. I don’t know the price for the 42” HP 800, but again, if the Xerox costs anywhere over $20K you can surely get two of the HP or Encad or Canon for that matter, for the price of a single Xerox. As of September 2003, pigmented ink is available for the new Canon imagePROGRAF 8200.

The main advantage of XES is a six month outdoor warranty without lamination. Not exactly the 3 years you get with solvent inks on vinyl, but with the Xerox you don’t violate European health laws which now restrict solvent-ink printers. With lamination you get 3 years outdoor warranty, which is the same as you get with the UV pigmented inks from Hewlett-Packard for their HP 5000 and 5500 printers. So for longevity outdoors, the oil-based ink appears to have no advantage after six months. However if you compare the XES ColorgrafX X2 with other CAD systems, virtually no other CAD printer offers pigmented color. The HP DesignJet 1050 and 1055 (which we have and like very much) have a pigmented black, but CMY are dye based.

RIPs for the XES ColorgrafX X2

One option is an excellent RIP software combo package from Caldera, a capable French company. I visited with the folks from Caldera at a tradeshow and was very impressed with this software. Unfortunately we do not have that RIP (we have ColorGate, PosterJet, PosterShop, Wasatch, BEST, ErgoSoft and several more RIPs are being sent after contacts we made at recent IPEX tradeshow in England). However did not notice Caldera there; perhaps it was in the XES booth which I did not visit. The price was impressive too, evidently $7,000! The average RIP for a normal printer should cost about $1,500 to $1,800 for a 1-printer version or $2,500 to $3,400 for a multi-printer version.

Colorbus Cyclone hardware RIP is also available for the X2. Since this is a hardware RIP it means that the product comes already built into a computer. If this same RIP can be upgraded in the future, if the same RIP can run other brands of printers, then you should seriously consider this project. But, if it can only run the X2, that means in two years the RIP will be obsolete too.

Current Status of ColorgrafX X2

XES did not show up at ISA tradeshow in 2003. When I asked others at the IMI conference I was told that they XES closed their doors on wide format inkjet printers. If so, they went without really saying goodbye. During May I telephoned the XES offices and the former XES people I knew seemed to have disappeared. The product could not be located on their site at that time.
Yet their printers were back on their web site when I checked again in September 2003. I have no idea whether the printers were off the air for a few days, weeks, or months, or why they skipped ISA tradeshow if they intend to seriously continue.

If the printer division did go through a corporate hiccup there were potentially four factors:
- first the lingering reputation of the Xpress 54;
- the lack of a wide range of media which works with oil-based ink
- the high cost of the printer, about twice the cost of anything comparable
- the even higher cost of the RIP, double or triple the cost of perfectly good RIPs elsewhere.

All this suggests that oil-based ink printers, at an exaggerated price, were not always a good investment. Their RIP was so expensively priced one had to ask why? Why is their RIP any different than the same brand of RIP for an Encad, Canon, or HP printer?

The official statement is that XES has been folded back into Xerox. The new name is Xerox Wide Format Solutions. However when I went to the site, and filled out the form requesting information on the Colorgrafx X2, no one replied and it has been over four months. Nonetheless, X2 printers are stated to be in stock; indeed the factory full of printers is considered the reason why they were put back onto the web site. Thus in theory the printers are supposedly available. I have no idea on the current price since no one replies. It appears that virtually all the original staff were summarily dismissed a few days before Christmas in 2002. So one question to ask would be, how there can be enough experienced people remaining to provide service after the sale?

The other question is what might happen to re-sale value of a printer that potentially may be dead-end? And how many media companies will bother to offer after-market media to a discontinued printer line? Does this mean you are stuck with high-priced OEM media from Xerox? We can’t answer these questions but a savvy buyer will ask them. Too bad, because the printer did have several technological advantages, such as speed, instant-dry, and so on. Problem was the excessive price and attempt to market as photo-realistic quality.

Evidently Xerox Wide Format in Great Britain and Europe is recovering from the transition earlier. A further advantage in Europe is the relationship between Xerox and Caldera, an impressive RIP from France. The result is that the X2 has reportedly been more popular in Europe, as well as in Asia and South America. However we do not know of any installations in Guatemala. The price would probably keep the printer out of this market. However there was not a single X2 shown at DRUPA 2004 trade show in Germany.

The X2 in America is reportedly now configured as the X2 Tech, with three black and CMY ink lines to speed up monochrome printing (of drawings).

XES advertising and PR releases claim high quality even at draft speeds. So far tests in the FLAAR labs at Bowling Green State University have documented that draft speed from Epson piezo printers and Canon bubble jet are both unusable. This is a polite way of saying that output at high speed mode is junk.
Thus it would be wise to be wary of any Xerox claims until the output at high speed mode can be tested by FLAAR and compared with the output from Canon, ColorSpan, Encad, Epson, and HP.

In February 2004 we were told, by Xerox, “the X2 has been in stop order status for two years.” This was a result of my pointing out that I had telephoned and tried to get information on the X2 sometime in November 2003 or thereabouts, and no one from Xerox followed up. That made me suspicious of whether the Mother Ship was really picking up the pieces from the former daughter (XES). Perhaps all the X2s were shipped to Asia, Europe, or Latin America, where they reportedly always have done better than in the US.

The summary is that few people in Xerox appear to know the story so how is a normal mortal supposed to understand. Would you buy a wide format printer from this company?

Don’t you find it somewhat misleading when a printer is advertised, stated to be available, and when corporate managers state all is well, when in fact the printer is either not available or there are few if any experienced service personnel to handle it?

It is also worth pointing out that FLAAR is the only source of accurate information on such no-show printers as the Kodak 5260 and now the XES ColorgrafX X2. Why is it that no one else provides this kind of educational service for end users?

**Comparisons**

If you don’t mind the high price for everything associated with XES printers, we feel they are nonetheless preferable over the original Seiko oil-based printer, though its lackluster output has improved a tad over the last two years of improvements into the Mk-II models. But every printer has some nice feature that someone somewhere will like, so you should get additional outside opinions. If Seiko continues with their models and XES continues to phase itself out, you may have more likelihood of spare parts and tech support from Seiko for their printers, than from a company that just ceased to exist (even if they were brought back to life under a new name shortly thereafter). We try hard to obtain reliable facts, but when there is contradiction between a press release and what is actually happening in the real world, it is difficult to figure out the true scenario. A lot will depend on what we hear at SGiA trade-show in mid-October. There we learned that XES did indeed shut down shortly before December 2002. The printers which remained unsold at XES were moved back to the Mother Ship (Xerox itself) and if you dig deep enough with patience you can find them on the Xerox.com web site.

**Feedback from users**

With respect to the ColorgrafX X2, we have received like it’s speed and fast-drying surface. But my question is two, or three, of the fast thermal printhead machines, or an oil-based printer in that fashion. If a ColorgrafX X2 is a good deal. But at three times the price of a regular flexible water-based printers instead of one rigid platen laminator might be more flexible. Nonetheless, if you all of a sudden have an order for 300 POP signs, it may take a printer the speed of the X2 to handle such orders. Canon printers, or the ColorSpan X12.
Limited media

Previous reviews of oil-based printers noted lack of glossy media and long dry time on some media. I rubbed the image and it was fully dry. Don’t even get that with an Encad which is why Encad printers require a dryer as well. Evidently if you select appropriate media for the XES ColorgrafX oil inks then you get instant dry, directly from the printer. Sihl may make media for oil-based printers. Otherwise there is not much choice since hardly any company other than Seiko attempts to market an oil-based ink technology. Thus the speed is limited to the few kinds of media which happen to work with oil-based inks.

Printheads and Body of the Printer

XES itself does not give out much information in their literature, so we have to ask around. Thus we don’t always get the full details, but reportedly, the printheads were from Konica with Xaar license. Reportedly the printers themselves were built by Olympus. It is noteworthy that Konica itself was never able to get its own Konica Iguazu wide format 8-color proofer to function in full production. That water-based printer looked great at many tradeshows in 2000, but was never sold in the USA. It was withdrawn from the world market before it really appeared outside of Japan.

DGI

It is difficult to fully understand which company is which. I have seen the name Dilli Precision Ind. Co., Ltd, Korea, and DGI Korea. DGI calls their model the OmegaJet OJ-62. Dilli showed their model OJ-62D at a recent tradeshow. Both printers use an oil-based pigmented ink. Print heads appear to be 200 dpi, increased by multiple passes to 400 dpi.

The DGI OmegaJet OJ-62 is a more simple-looking printer. The legs are not enclosed. In distinction the Dilli model OJ-62D has enclosed legs.


Be realistic about Oil-Based Systems

If the ink, media, and printer manufacturers had explained the pros and cons of oil-based inks in the beginning, it would not have been necessary for FLAAR to include this Report in our educational program.

- If a sheet of oil-based ink print is folded, the image may stick.
- Scotch tape on the back of the image may suck the ink out.
- Some media, such as Yupo, looks nice, but there is a problem where there is a density of ink. The ink migrates to where there is high density ink laydown (such as thick letters).
- Oil based print, if laminated with PVC, may well up.
- Be wary of oil-based ink associated with PP.

Positive Features of Oil-Based Ink Printers

With oil ink, the output is dry to the touch immediately after printing. There is no smudging. Smearing is a serious problem especially with printers that lay down lots of ink. ColorSpan and Encad are renowned for their high ink usage, which results in the heavy color saturation that is needed for sig-
nage. This ink can take hours to dry, so if your printer has a take-up system, it can’t wind the paper around the take-up system while it is still wet, so the whole system has to print more slowly. Prints on some media still smear even if you touch them weeks later. This is an ink-media interaction. But with the XES and we guess probably with the Seiko printer, you don’t have this wet-ness or smearing problem ever (instead you have other aforementioned problems).

Since we do not have an oil-based ink printer available to compare with other printers, we can not certify their speed claims. We are not sure they have taken ColorSpan or Mimaki into consideration: both can use dual sets of six inks in their 12-ink systems. But I do recognize that the XES in particular is fast. The question is whether photographers will accept the output. For signage and other usage, viewed from a distance, the output is acceptable.

XES itself points out that you can use a solvent-based marker on the print. The same marker will turn most water-based inks black.

XES also points out the prints are water resistant. I give them points for being honest when they added, “but not waterproof.” Nonetheless, in many cases you do not have to laminate the printer.

Other than speed, lack of smudging, and short-term (6 month) longevity, I can’t offhand think of any particular advantage whatsoever to having these kinds of printers other than for wallpaper. However if we are able to conduct site-visit case studies, perhaps we can learn of some benefits that we have overlooked. Canned success stories are merely PR releases, and have as much value as any other regular advertisement. In other words, a success story only tells what looks nice at first. None of the downsides are admitted in a success story.

**Summary**

The best way for you to decide which printer to buy is to understand the technological differences, for example, between a Xaar head, a Spectra head, an Epson head. They are all piezo. It is our understanding that the XES may have used a Konica piezo head. Konica makes a variant of the Xaar printhead, which may explain the so-so quality of the XES oil-based printer. Then compare what you learn about piezo with the pros and cons of thermal printheads (used by Canon, ColorSpan, Encad, and HP).

Don’t necessarily pay attention to the sample prints by the manufacturer. What you want to see is how do your own images, or those of your top clients, how do they appear on the printers you are considering to purchase.

Just realize that too many other printers offer higher photo quality. Not the fault of XES, it’s the printheads that limit the resolution. Those printheads do not come from the world of fine art nor photography, but rather from postage meters, fax machines, and solvent ink systems where anything over 75 dpi is considered “photo quality.” Vutek claims photo realistic quality for their solvent ink systems (Spectra heads give slightly better quality than Xaar heads). But if you come from the world of professional photography or graphic arts, you want crisp lines and vivid images that attract attention. That’s what Epson piezo heads produce, but they are painfully slow.

So it’s a choice, speed with short term outdoor longevity with the XES or photo-realistic quality but slower printing with most other printers. If you want them both you need a ColorSpan, Encad, an HP 5500 or Mimaki JV4. The Matan would also be instantly dry, since it prints with thermal dye transfer from wax or resin ribbons. There is no wet ink so the media is not wet.
Or, if your viewing distance is 20 feet, the output from the XES looks fine, especially if your original image is outstanding. It's only close-up that you can see the fuzzy splotchy results of the piezo print-heads.

Since the manufacturers supply either no information, inadequate information, or sometimes potentially misleading information, we have felt that end-users deserve to know, before they buy, what they are actually getting into. This should benefit the printer manufacturers in the long run, since misleading ads violate a host of federal statutes.

**Final Observations**

Oil-based technology for printers is, for the year 2003 and 2004, essentially a non-entity. XES did not show any ColorgrafX X2 printer at DRUPA 2004. Seiko did not show their oil-based printer at any trade show during 2004, including not at DRUPA. D.G.I. did not have a booth at DRUPA.

Not many companies made media for oil-based inks to begin with. Now even fewer will offer such materials.

This means that inks, spare parts, and tech support for any oil-based printer are at your own risk as to whether you will be able to obtain support. After-market inks are available, but note the following Warning.

So if someone offers you a used printer, and you know it is in perfect operating conditions, for perhaps $3K to $5K, if it has a good RIP, it might be a worthwhile risk if your clients need lots of copies quickly. The XES excels at speed for reasonable quality: not photo quality, but from a normal viewing distance, if the original image is exceptional, it will reproduce nicely.

**Warning, Advisory**

Be careful of using any after-market ink in the XES printers. One owner of an XES ColorgrafX X2 printer in Peru effectively destroyed his printer with after-market inks.

**Does Oil-Based Ink have a future?**

XES failed not entirely because the ink was oil, but because the company was not in synch with the rest of the wide format printer world. Xerox comes from the world of copiers and monochrome architectural reprographic machines. Xerox sells mainly to Fortune 500 companies. The Xerox exhibit at DRUPA 2000 was a perfect example of most of what was inappropriate. As a result, the exhibit was completely empty, as in, no one was bothering to look at the printer. It sat alone. Indeed there was not even a XES manager or any booth attendant associated with the XES oil-based printer.

All the Xerox folks were with their laser printers, copiers, and machines that their Fortune 500 customers liked the most.

Sign shops are not Fortune 500 companies.

XES had a flawed pricing structure: everything about the printer was over-priced.
And XES did not capitalize on the few benefits they offered. They attempted to sell the printer as a photo-quality item when it’s Xaar-based Konica heads (or whatever they were) simply were not comparable even to Encad or HP, much less to the higher quality Epson, Roland, or Canon.

FLAAR awarded the X2 the “best advancement from one generation (Xpress) to another generation (X2)” and we were interested in testing to find out what applications the X2 would excell in. Since our background was architecture, and since XES pushed their products into this market, we were always amused that XES never got their act together to even come visit our facility at either university, where they would have noticed our architectural affiliations.

Seiko failed because their early ads promised more than their Xaar-based printheads could possibly provide. By the time their printheads had improved, and by the time their ads were toned down to be more realistic, they had already damaged their brand name because of the silly advertising hype of the previous several years (DRUPA 2000 through 2002).

Our Appendix A, and comparable success stories elsewhere, show that the technology does indeed have benefits. Frankly I would rather have an oil-based printer in my office than eco-solvent. FLAAR works with many companies to design their next generation printers, primarily as consultants to advise what features end-users want, and into what markets and applications such-and-such a printer technology should be targeted. We hope that oil-based inkjet technology can be reborn and we would gladly participate in, and encourage, such a rebirth.

Sources and Resources on the Internet


[www.xes.com/products/graphicarts/colorgrafxx2.htm](http://www.xes.com/products/graphicarts/colorgrafxx2.htm) (Suggests that as of the first weekend of September 2003 the XES ColorgrafX X2 was still being offered. They give telephone number of 800 Ask-Xerox, (800) 275-9376.

For Further Information:

A place we recommend for you to obtain further information on solvent ink printersis from Scarab Graphics, toll free (800) 350-1366, or [info@scarabgraphics.com](mailto:info@scarabgraphics.com). They offer both Mimaki JV3 and Lyson Tiara solvent ink printers, as well as Canon, HP, and both PosterJet RIP and Wasatch RIP.
Appendix A

Alternative Viewpoint on the XES Oil-Based Printers

FLAAR does not buy or sell wide format inkjet printers. We do not make or lose any money whether or not someone buys a XES, or Seiko, or DGI, or a solvent ink printer instead.

Our client is the end-user. Our income is derived in part from the FLAAR Reports. These FLAAR Reports offer value because they are independent and factual. To be factual it is essential to express all sides of a printer, the pros and well as the cons.

A reader in Poland wrote us to say that his two XES printers (first the Xpress and then the X2) had advantages for his sign shop. Thus we feel that our readers might wish to benefit from his experiences.

Date: Mon, June 7, 2004 8:08 am

Dear Nicholas,

Regarding Xpress printers there are two different items, the old Xpress we were using for 4 years.

Well it was not cheap solution as we paid around 50.000 USD with RIP. But the matter is what it is used for.

Our company is printing and laminating since over 10 years. For us essential was speed and consumable costs. Both parameters at the time we chose it were attractive. In addition it was possible to sell un laminated prints as posters, and it was working well. Oil inks allowed us to produce billboards that last for over three months, and wallpapers. Yes the choice of media is very limited, so we have no cause to chose for better, new media. After all - we need paper, and from time to time any specialities. Since paper was OK - why search for new one, test it etc.

There is another important factor. We were using all the time the same paper and inks. With little help of X-Rite’s Swatchbook we managed to keep stable colour. So our customers were happy knowing what they can expect. It also happened that we had to reprint damaged part of job done months ago. And it also works.

Regarding quality - of colors that there is a lot better printers with smaller dots - even achieving 1440 dpi. But who needs that for a pop-up system where input file is usually not the top quality photo (hardly more than 75 dpi). The same with billboards, adv. posters etc.

Well there was always 720 dpi, and than even precision maps were acceptable. I would fully agree, that we could get better quality from many other systems 5 years ago, but if we consider speed, rigid construction, low costs of inks and above facts choosing Xpress was a good turn. There was noticeable banding in case of some colors, and necessity of servicing at least twice a year, but we had good experience with Polish representative of Xerox.
Now we upgraded our old Xpress to X2. This is not a newest model on the market, XES has all the problems, so we get a very nice offer, and for the cost similar to other printers we can enjoy new machine. It is printing approx. 3 times faster than the old one while keeping the same good quality. There is no any noticeable banding even on big surfaces of constant colour. All the improvements in calibration and mechanical construction makes X2 a machine that we can rely on. Fast printing saves a lot of problems with our always late customers. Added two ink colors with 720 dpi presentation mode of printing giving very good quality even on most demanding architectural renderings. With media is about the same problem - small choice, on the other hand well calibrated machine does not need too much different media. Now many solvent printers appear, but I decided to not enter that technology because we are focusing on indoor graphic for advertisement, exhibitions, musems, meetings etc. Producing prints for many different customers I found X2 as a good solution. It is producing close to 1000sqm per month without any trouble, and without hurry.

Regarding RIP - it is generally working, but I observed last time, that in case of some files, that are including transitions of colour from dark to light (for example brown) it produces posterized outputs in case of 720 dpi resolution. I wonder if it is a matter of RIP or the file. Looking very carefully on the monitor it is possible to find that effect in the file, however only slightly noticable. I wonder if you ever met similar problem.

If you like to further discuss about any specific subject related with my experiences with Xerox - it will be great pleasure for me to answer your questions.

With very best regards

Adam Bokwa