FLAAR Reports

May 2010

HP Scitex LX600, LX800

HP Latex Ink

Printer Evaluation

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HP Designjet L65500 at ISA 2009

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Introduction

I thank the many individuals who assisted me in learning about latex ink and the L65500 printer. I have interviewed printshop owners and managers who use the HP L65500 daily. I have also interviewed people elsewhere in the industry to see and hear is each segment of the industry saying, or asking, about HP latex ink. So we have learned how printshop managers like, or dislike, the printer when it is unpacked and put to work.

Has HP influenced my comments? Yes, of course. HP flew me to Israel to be trained in this technology months before it was even mentioned elsewhere. I was deep in HP world headquarters R&D rooms, again, long before the printer was readily available.

Then there was a second trip to Barcelona (world headquarters of HP wide-format) to learn how the printer was doing out in the real world. Two managers of large printshops were flown in to speak with us.

I will compliment HP in that these two managers were not scripted. They answered from their own experience. They did not read some silly PR release. But equally obviously, you knew before they appeared that they would like this printer. And that is the core of the message of this evaluation: HP latex ink is great if this is precisely the range of ink and range of media that you and your customers are interested in.

But is this an appropriate printer for a general printshop? Can this replace solvent ink, much less even consider replacing UV-cured ink? These were the crucial questions the last 18 months. But since recently, there has arisen a totally unexpected dilemma: the advent, and advance, of another completely different resin ink: Sepiax. And on this aspect I ran into the owner who had bought the HP 104” latex printer early on. He likes HP equipment and has almost a million dollars worth.

Did he like the latex ink ? And after he bought the HP latex printer did he switch to Sepiax ink? This will be answered throughout this evaluation as well as in other upcoming FLAAR Reports. We have been very busy these last two years.

So the advantage of HP flying me to three training sessions is that this allowed me to meet print shop owners that were content with the printer, the ink, the media it printed on, and with HP service. They were satisfied. If HP had not provided this training, I would have been at the mercy of the rest of the world, the people that thought eco-green was great and without further thought simply bought the printer.

Then reality set in, quickly.

So this FLAAR Report is based on two years of research. It would be a challenge to find another other resource that has looked at latex ink from both sides.

THE BASICS

1. Brand name, model?

HP Designjet L65500 since launch at DRUPA 2008. The name was changed to HP Scitex LX600 at IPEX in May 2010. This is the original 104" model.

The 126" version (3.2 meters) is the HP Scitex LX800.

2. What is the nature of the company? Is this company the manufacturer, distributor, or rebranding?

HP conceives, designs and engineers all printers in their own facilities (Barcelona, Israel, Minneapolis, San Diego and elsewhere). The printers tend to be contract manufactured (Malasia, Singapore, etc).

HP Designjet L65500 at SIGN Africa 2009.

3. What other printers are the same or similar chassis from this manufacturer or distributor? Is this same printer available elsewhere under a different name?

The 42" and 60" latex ink printers are on the chassis of the HP Designjet Z6100. That platform and the industrial-strength 104" latex ink printer are quite distinct. The L65500 model is the proverbial built-like-a-tank.

HP Designjet L65500 at Sign and Graphic Imaging, Dubai, 2009.

4. What other printers of other brands are comparable?

No other company has shown even a concept-car or other prototype for any printer that can even remotely compete with any of the HP latex ink printers. Encad VinylJet failed (not enough substrated would work with that DuPont ink and Encad did not have the investment capital or clout to be successful.

Staedtler Lumocolor failed a bit because of the chemistry of the ink but mainly because of the chemistry of the company's posture towards printer manufacturers. No major manufacturer was willing to take on their ink as a result of industry politics.

The alcohol-based ink of Kiian Manoukian seems to have failed. Bio-solvent ink is not even used by its own developer (InkWare, now part of EFI and across the street from VUTEk). So the only ink that has been shown to the public that might compete with latex ink is Sepiax. This ink is now being rolled out, one continent at a time. Sepiax has a much more realistic relationship with the rest of the industry than did Staedtler.

Roland and Mutoh claim they have "things in the pipeline" but neither is an ink company and my sources state that indeed nothing is seriously underdevelopment. The competitors assumed latex ink would flop and did not prepare any ink that could compete with it. Epson has done more with innovative inks than Roland or Mutoh (the silver effects ink of Roland is not their ink, it is probably from Eckart).

So again, until FESPA 2010, there is nothing to compete with HP latex ink, especially not in an industrial-strength printer chassis such as the L65500.

5. How does this model compare with comparable previous printers?

This model is unique and built from the ground up to handle the heaters necessary to cure latex ink. You could probably find features based on experience from Scitex Vision, but as far as I can see, the development area was largely in Barcelona.

6. When and where was this model first introduced?

The HP L65500 was officially launched at DRUPA 2008 but was shown before then to hundreds of people (under NDA) at well organized PR events in Israel and then later in Barcelona.

Several new features were shown at Sign UK 2010. Then the 126" model, the HP Scitex LX800 was launched at IPEX 2010.

Dr. Hellmuth has flown to Spain twice and attended two Latex ink presentation sessions in HP wide-format printer world headquarters in Barcelona.

Nicholas inspecting the HP L65500 at ISA 2009.

Nicholas was inspecting the HP L65500 several times during his two weeks at DRUPA (fortunately no other trade show organizer has anything as unrealistic as DRUPA's excessive two weeks).

7. Is this mature, or still in alpha-stage, beta-stage?

The HP L65500 is now mature; the L25500 is still new but was launched during autumn 2009. The HP Scitex LX600 is primarily a change of name for the same structure (though obviously some aspects are improved now). The wider version, 3.2 meters, the LX800, is still new.

8. What other costs are involved?

Two other costs are involved: rewiring your building since this printer requires sophisticated electrical power. Then the other cost would be your electrical bill to cure the ink, and then your air-conditioning bill to cool down the room.

9. Do you need an uninterruptible power supply (UPS)?

In some countries a UPS unit may be useful. Just realize that it may take an industrial strength UPS unit to handle the needs of this printer (but you would certainly not want to run the printer's heaters with any UPS unit, even an industrial strength one).

WHAT IS THE INTENDED MARKET FOR THIS PRINTER?

10. What is the market that the manufacturer has designed this printer for?

This printer is designed for signage, but the quality is good enough for additional applications such as interior décor such as wallpaper (but not giclee; there is a subtle difference).

11. Are other markets buying this printer that were unexpected?

Many printshops are buying this L65500 for exhibition banners and signage and vehicle wrap. Since HP latex ink is dry out of the printer, it can be laminated immediately. This is a notable advantage over solvent inks (which require out-gassing for 12 to 24 hours after printing.

HP Designjet L65500 at SIGN Africa 2009

There are also people buying this printer to print on polyester and those fabrics for which this printer's feeding system and heat allow.

PURCHASING

12. Are dealers national (most companies) or regional (Roland allows a dealer to operate only within a limited regional area)? Does a buyer have any choice in dealers?
Dealers in US are local, regional, and often national. This situation varies in other world regions.

STRUCTURE OF THE PRINTER

13. Is this printer made originally as a latex ink printer?
This is not a solvent printer that has been jerry-rigged to handle latex ink curing. The printer probably shares some features with HP Scitex solvent printers, but latex ink has so many special requirements that it works best to be designed from the ground up specifically for latex ink. This is the logical reason why this 104" model originally cost over $100,000.

In distinction, the 42" and 60" are a retrofitted HP Z6100 chassis, so quite different (this keeps their cost down significantly).

14. If there is a vacuum function?
Yes.

15. In how many sections?
All sections are controlled as one section.

16. Can you turn one or the other section(s) off and on?
No, all one series.

17. Just Off and On? Or variable?
Adjustable.

18. What are the features of the platen area?
This is a unique platen: has ridges across the vacuum area to prevent media from sticking. Probably in case of heat. Platen heat is 60 degrees C (it is post-heading that is 93 to 100 degrees C). In the platen area 50 to 70 is the usual range. 60 is average.

19. Are their edge guards (media clamps)? At left, or at right, or both?
Yes and yes.

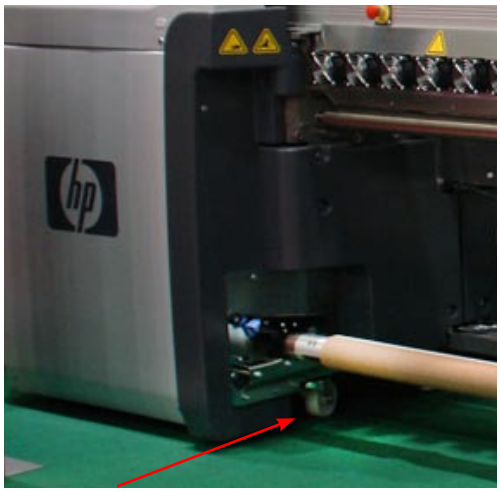
20. Can you move the left guard, or the right guard, or both?
Yes, but the operator seemed to struggle a bit when moving them.

21. Does the printer have leveling supports? How many, and how strong?

I was told there are three leveling stands. That is an unusual number, Usually a big printer will have four or six or eight. But HP knows engineering so if there are only three there is good reason.

22. Does the printer have wheels? Are they robust?

Four wheels.



Wheels on the HP Designjet L65500

ROLL-FED ASPECTS

23. How is roll media fed? Pinch roller against grit roller?

The User Manual best explains how the media is fed: “The substrate is moved forwards by the drive roller motor…” (p. 17). But actually both the front spindle and the rear spindle both have motors.

24. Are the pinch rollers same size as grit rollers, or smaller?

The pinch rollers act on a “mail roller” rather than a grit roller. Grit rollers would be of uncertain reliability on a 104” width. So this uses a more professional tension system, but also does have pinch collers too.

25. How is the roll held at the feeding position? On a spindle? On a saddle?

Old cores (or cores damaged in shipment and handling) tend to be a problem on a spindle. On 5 meter wide machines the material tends to be banner material so there are not as many issues on a saddle. Paper-like media may sag in a saddle. “In general, if you hang a roll on a spindle, this is best” (observations by Mutoh managers at European factory).

26. How is the roll media handled at feeding position? For example, is there a dancer bar?

No dancer bar.

27. How is the roll media handled at take-up position? For example, is there a dancer bar?

No dancer bar at take-up position either.

28. What is the media path?

Basic time-proven media path at the back. At the top and front the path is determined by the needs of curing (the intense heat and how much time the substrate needs to receive this curing heat).

29. Front loading, back loading?

Back loading.

30. Is there a cutter? Is it manual or automatic.

A cutter on-board would not be expected on this kind of a production printer.

31. Is there a "knife guide," a slot where you can draw your knife down and across the width of the substrate?

In general, detritus from cutting anywhere near the platen can be a factor in printheads clogging.

Back part of the HP Designjet L65500 at Sign and Graphic Imaging, Dubai, 2009.

HEATERS & DRYER

32. What about heater or dryer? Is there a pre-heater, platen heater and post-heater all three, or just one, or two? How many heaters does this printer have?

This printer has two integrated heaters.

33. Where are the heaters located? Is heater on top of, or under, the media?

Front and print area.

34. What is average monthly electric bill?
It would be helpful if there were a before and after figure on the electrical bill.

35. What about fans?
There are 21 fans across the front.

36. Is an auxiliary heater or fan offered, or needed?
No extra heater is needed at the front. HP and Scitex have engineered plenty of curing temperature within the printer itself.

Fans on the HP Designjet L65500, photograph taken at FESPA Amsterdam, 2009.

UPGRADES, Future Improvements?

37. What features have been added, or changed since the printer first appeared?
The model that most people have is the original model. At ISA 2010 there were additional features, so clearly HP has a forward path for this platform.

OPERATING THE PRINTER

38. Can the operator manage print jobs via the Internet with this printer?
If you have Onyx RIP you can manage jobs through the Internet, or at least see what the printer status is.

39. What is the level of ease of use? Can anyone use this printer or do they have to be trained and certified? What about daily and periodical routine maintenance? Is the printer user-friendly?
“Simple to run. But, tough to set up new media. This requires skill. Learning how to test new media takes the longest of any task with this printer.

40. Do you get an LCD screen in the printer or a real computer monitor? How big is the screen or monitor?
As with all old-fashioned water-based and solvent printers, you get a tiny LCD monitor fixed into the front panel. ColorSpan was one of the few companies to have a nice-sized LCD monitor on their printer. But you will tend to run other functions from your RIP and for that you will need a separate computer anyway, and this will have its own separate monitor which hopefully will be a reasonable size.

41. Is the position of the LCD screen or monitor user-adaptable?
Not really.

42. How many operators or operator assistants does this printer require?
Needs only one operator except to load and unload a complete roll. For that two people would normally be required unless there were a wheeled loading system to roll the roll up to the printer.

LCD screen on the HP Designjet L65500.

43. Where does the operator stand or sit?
Front right.

44. What is at either end?
Ink is at the left, but more at the top and not really at the end.

45. Is a foot pedal included (for operating aspects of the printer)?
I have not noticed any good pedal.

CONSTRUCTION (BUILD QUALITY)

46. What is the solid-ness of the construction of the outer body? Is it plastic? Metal? Heavy gauge?
The core structure is heavy gauge metal. The ends of the machine are rigid plastic. The 42" and 60" versions are based on the largely plastic Z6100 chassis and are quite distinctive. But the 104" version is no wimp.

47. Is there both a front hood and a back hood?
The back hood does not open.

48. The hood, is it strong, or cheap plastic?
Economical plastic here, but the rest of the printer is plenty strong.

49. Does the hood have a frame?
Not fully.

50. Does the printer wobble back and forth when printing?
Does wobble a bit, but nowhere near as bad as the 3.2 meter Gandinnovations solvent printer whose monitor wobbled so much by the start and stop of the carriage acceleration that it would have made an operator dizzy if they tried to look at the screen.

HP Designjet L65500 at Sign and Graphic Imaging, Dubai, 2009.

AESTHETICS

51. How would you describe the design of the printer?
Solid.

52. Can you easily tell which is the "front" and which is the "back'?
Yes.

SET-UP OF THE PRINTER: PRACTICAL CONSIDERATIONS

53. What are the electrical requirements of this printer? This means, will the building have to be rewired.

Three phase: 200 to 220 VAC (+/- 10%); 380 to 415 VAC (-10% + 6%); 50/60 Hz; 32 max.; single phase: 115 to 127 VAC (+/- 10%), 200 to 240 VAC (-10% + 6%) (Japan 200 V); 59/ 60Hz 10 A max.

54. What is the size and weight of the printer

(WxDxH) 5.17 x 1.66 x 1.66m (16.98 x 5.45 x 5.43 ft).

INSTALLATION OF THE PRINTER

55. Is there a Site Preparation Guide? If so, is it helpful?

There is a six page site prep manual. And then there is a 17 page version, so I am confused why there are two.

However the question about “adequate ventilation” seems to contradict rather curiously claims in PR about the lack of need for ventilation.

The questions about electrical fire prevention also would raise questions in most countries where wiring is, most politely put, rather jerry-rigged.

The fact that the site preparation manual raises questions actually documents how good it really is. After all, print shop owners will find out the reality sooner or later, and might as well be properly informed up front. So I give good marks to the author of the Site Preparation Guide.

56. What is the rating of usefulness of the User’s Manual and other associated materials?

The User Manual is a modest 58 pages but is short possibly because there are several other manuals that cover site preparation, etc.

57. Is there a glossary in the User’s Manual?

Yes, this is one of the few printer manuals that has a nice glossary: two pages worth at the end. Plus, there are another two pages of glossary-like descriptions on pages 13-14.

58. Is there an index in the User’s Manual?

Yes, there is a modest index, slightly over one page worth.

59. What is the native language of these guides? Is the translation acceptable?

HP manuals tend to be written in native English, or if not, whosever does them is quite good in English. Definitely better than manuals from China or manuals from Mimaki in Japan.

60. What kind of cut-away drawings or other drawings exist that show the various parts of the printer?

There is a ¾ view of the front and ¾ view of the back, but at a scale so small you can’t see any details.

TECH SUPPORT & WARRANTY

61. What are the hours of tech support?

If support is from the Eastern time zone, the hours should be at least 8 am through 8 pm to cover users on the West Coast.

PRINTHEAD Technology

62. What printheads are used? Xaar, Spectra, Epson, Konica, Seiko or other?

This printer does not need piezo printheads. HP uses their own printheads, which are an advanced thermal inkjet technology.

63. Is the printhead identified in the spec sheet brochure by brand or also by model, or not at all?

Yes, the printhead is identified clearly as being from HP and being a thermal printhead.

64. Explain the pros and cons of Xaar, Spectra, Epson, Konica, Seiko or other heads relative to their ability to handle solvent inks. If Xaar heads define how long they last compared with Epson or Spectra heads.

Every kind of printhead has its positive and negative features. HP specializes in developing, designing, and manufacturing their own printheads. They know printheads inside out.

A few competitors, such as Epson, whine about thermal printheads and claim that their own piezo heads are perfect because they are permanent! This of course is self-delusion. Epson printheads wear out like any other brand of printhead. Piezo heads clog on a regular basis. But they produce nice quality in the meantime. So every head type has good features and downsides.

HP Designjet L65500 printheads.

PRINTHEAD DPI & Print Quality

65. How many print modes are offered?

Indoor
High Quality Plus mode (8 pass): 21 m²/hr (231 ft²/hr).
High Quality mode (6 pass): 28 m²/hr (306 ft²/hr)
Production Plus mode (5 pass, only SAV): 34 m²/hr (368 ft²/hr)
Production mode (4 pass): 43 m²/hr (460 ft²/hr)

Outdoor
Billboard Plus mode (3 pass): 55 m²/hr (587 ft²/hr)6
Billboard mode (2 pass): 79 m²/hr (846 ft²/hr)
Draft mode (1 pass): 157 m²/hr (1691 ft²/hr)

66. How many passes can this printer achieve?

Up to 18 passes.

67. What is the quality like at one pass? Taking the various speeds that your printer advertises, please explain the quality or defects of the output of your fastest speed? What does the output really look like and is this sellable quality? Is the output at fastest speed junk or throw away, or would a Fortune 500 client actually pay for it and be pleased.

There is no 1-pass printing possible and even 2-pass printing is not realistic. The L65500 is an impressive technological achievement, but sheer speed is still to come.

PRINTHEAD Banding Issues

68. Is there banding in areas of solid black?

Not normally.

69. Does this printer offer intelligent interweaving or comparable software?

No interweaving solution noticed.

PRINTHEAD Life Expectancy

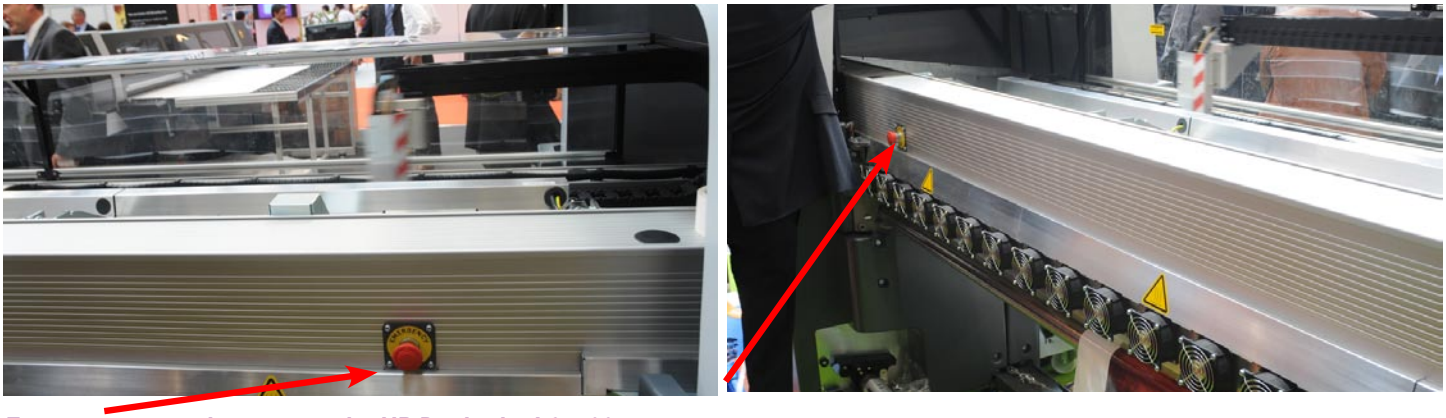
70. Is there an alarm system to stop the head from hitting substrate if head is not high enough?

The Mimaki JV5 has the best system I have seen so far to avoid a head strike.

SAFETY CONCERNS

71. Are emergency buttons present, and if so how many, and where are they situated?

Two emergency buttons on the front, but on inset area, not precisely where the operator might be. Two on the back, so total of four.



Front emergency buttons on the HP Designjet L65500.

Back emergency buttons on the HP Designjet L65500.

72. How much odor is emitted by the ink?

HP states, several times, that no odor is emitted by the ink. But everyone else points out that several substrates that can't handle heat well emit an unpleasant odor when run through the HP curing system.

73. Is the machine enclosed, or exposed?

The machine is relatively open compared with most solvent printers.

74. What causes noise on this printer (if anything)?

Fans across the front.

75. What is the noise level?

Noise is bearable.

76. Are any other safety or health issues involved? Does the operator need to be concerned with any other safety precautions?

The user manual clearly tells you even to wear gloves when handling the ink (even though this is not solvent ink). This warning is clearly important, and would tend to make you question the green of an ink that requires gloves.

77. Is the Operator Manual so poorly translated that you might make a mistake; a mistake that could be damaging to your health, or otherwise dangerous for your printshop?

The manual appears to be written in native English. I don't see anywhere that poor English exists or would cause confusion. There may be an excess of PR-English claims about how much media it can really print on, but that is a PR policy, not poor English diction.

78. How easy is it to access the MSDS of the ink?

It is rare that the MSDS of the ink is easy to obtain. If the MSDS is an auto-download from the company website, this is how it should be. But most companies do not wish the end user to know which brand of ink is being used, so hiding the MSDS is not necessarily an attempt to hide the dangers, but may be to hide the source of the ink.

I tried to find the MSDS of latex ink. There is a link which displayed so much stuff that I did not have time or patience to figure out which was latex ink. I would rate accessibility to the MSDS as not exemplary. The MSDS should be an instant download without needing to figure out what is the HP jargon for the catalog name and number of the ink.

INKS

79. How many kinds of ink are available?

There is only one kind of ink because this is not a flatbed printer; there is no way to print on thick rigid materials. Presently there is no aftermarket ink either.

80. Is this a full-solvent, mild or lite-solvent or eco-solvent?

"Has the same level of "solvents" as other water-based ink printers." But there are not yet any specs on comparison of % of solvents in latex and any % of solvents in Sepiax resin ink.

81. What company makes the inks? Choices include DuPont, Sericol, Sun, Triangle, KonicaMinolta, Tetenal, Toyo, and several others.

This ink may have been perfected by HP but was unlikely invented by HP. So far no one has revealed where this ink comes from.

82. How many colors?

Six colors CMYK lightCyan and lightMagenta.

83. Is white ink available?

No.

White ink is not really available for most inkjet printers other than UV-cured. Roland and Mimaki offer white ink but in past years until recently I have seen this more on Mimaki than on Roland. Now both companies are offering silver effects ink,but this is mainly to attract attention (smoke and mirrors rather than an ink that will offer serious production benefits to everyone). Epson is experimenting with a water-based white ink. They had it in a secret room at Print 09, and naturally did not want me to even know it existed. But because they acted so strangely in the booth, I suspected something was going on, and got all the information elsewhere at the show. It is a white ink with no titanium dioxide.


Bulk ink containers on the HP Designjet L65500, photographed at Sign and Graphic Imaging, Dubai, 2009.

84. Other than white, how many spot colors are available? What about metallic colors?
There is no white. There are no spot colors. There is no metallic ink.

White ink is readily available with UV-cured printers and with Mimaki and Roland eco-solvent printers. Metallic ink is available with Mimaki and Roland eco-solvent printers.

INK Cost

85. Does ink come in cartridges or bulk?
Since this is a 104 inch printer it needs bulk ink and offers this advantage.

86. Where do you add the ink? Front or back of the printer?
At the top left.

87. What is ink cost per liter (per cartridge, and per liter)?
Ink is not cheap and presently no after-market ink is available, though many companies are preparing such an ink.

INK Color Gamut

88. What colors can you achieve easily and nicely?
Pink and lavender look good.

89. What colors are hard to achieve?
Some colors look over-saturated. Some reds are not close. Greens are a bit “UV-like” meaning too yellow. When you find someone who knows the printer and is frank about its pros and cons, they will admit the color gamut is not extraordinary.

INK: Miscellaneous

90. What about ink drying time?
It takes a while for the curing heat to take care of the curing, so the printer is not the fastest thing in the world. A comparable comment would be appropriate for Sepiax ink: it too requires heat to start it’s curing (but much less heat than latex ink). Both systems will get faster as these systems achieve second generation development.

INK: Appearance

91. Is output splotchy?

At one trade show even 12pt font was splotchy. This was the same trade show where the colors lacked POP, shadows were lacking in detail, and color was not very true either. Perhaps a better engineer or operator could have coaxed better performance from the printer.

INK: Longevity

92. What about solvents such as cleaning solvents? Do they mar, dull, or wash away the ink or change the surface quality, especially on vehicle wrap?

- Ammonia (in Windex and comparable cleaning liquids)
- Acetone
- Cleaning alcohol
- Gasoline
- Soap and water with sponge
- Soap and water with a broom (frequently used to clean vehicle wraps in Latin America, for example)
- Scotch-tape pull-off test

SUBSTRATES

93. What is print width relative to roll width?

We have this entry because some printers are called “3.2” because they accept substrates that are 3.2 wide, but the printer can actually print only 3.1 meters. In such a case the model name is misleading (and incorrect in a sense).

94. Can you do borderless printing?

Over 72” printers you would not generally expect borderless capability.

95. How about maximum roll diameter or weight?

The roll can weigh up to 120 kg which is more than most single workers can lift by themselves.

96. Can the machine handle two different rolls of media side by side at the same time?

The original HP Designjet model did not handle two different rolls, but at ISA 2010 the dual-role model was announced.

SUBSTRATES: Issues

97. Does this printer’s ink require special media? Is it coated? Even if not coated, is it the really low-cost stuff, or is it limited (and hence by that very fact a tad expensive?)

In many cases latex ink requires that the substrate be coated. DuPont Tyvek is the best example that media must be “treated.” Sepiax ink can print on uncoated Tyvek.

SUBSTRATES: Image Quality

98. Do you get roller marks on some media? Which media? How bad are the marks?

Naturally whether or not you get marks from the path of the pinch roller depends on the pressure of the pinch roller, what substrate you are printing on, and how high your ink load is. Normally with an HP latex printer you would not expect roller track marks.

APPLICATIONS: What Questions should the printshop owner ask of himself?

99. What kinds of applications could we print tomorrow if we select the right printer?

In other FLAAR Reports we analyze the claims and counterclaims of latex vs eco-solvent+mild-solvent applications.

All I can say is the FLAAR list of applications from 2001-2003, before eco-solvent ink really became usable, and based on pigmented water-based ink of those years (HP 5000, HP 5500, ColorSpan, Mimaki JV22, Mutoh and Roland) is a longer list than anything I have seen for latex ink and actually the longest itenization of wide-format applications that exists for those years. Remember in those days Roland, Mutoh, and Mimaki were water-based, before Epson make it clear that Epson wanted all water-based applications for itself, and no printer assembler who used Epson heads was allowed to focus on water-based applications thereafter)).

Not many inks can print all applications or on all substrates. The best way to compare is simply to make a chart, with columns: traditional water-based, eco-solvent, latex, UV-cured. It is ironic that there are new inks that beat traditional water-based (but these other inks are so new, such as Sepiax, that no printer yet uses them).

100. Can you print fine art photos, giclee, or décor?

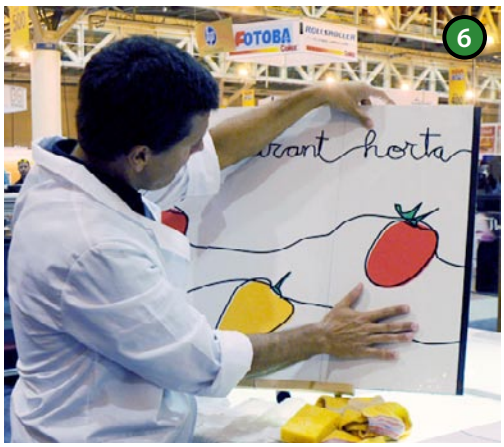
At 8 or more passes you can definitely print décor; At maximum number of passes you could print giclee if the colors in the original painting could be reproduced by the gamut of latex ink (which is probably a significantly better gamut than UV-cured).

101. What other kinds of applications can you print?

- Billboards (good on several materials, because viewing distance is far)
- Banners, general signage (good on most materials, because viewing distance is far)
- Exhibit graphics; okay if printed at more than 8 passses.
- Backlit; yes
- POP; yes, if printed at more than 8 passes
- Bus shelters, yes, especially if printed at 6 passes or more.

102. What kinds of applications are not something you should try? What applications print well, mediocre, or poorly, and why?

The question is more what materials, media, and aubstrates can't take the extreme heat of the curing that is needed for latex ink.So far no such list has been published.



HP had a very educative booth at SGIA '09.

Behind the Latex printer there was an area of applications.

In this sequence you see the installation of wallpaper media. In the upper set, the demonstrator removes a piece of material and cleans the surface.

In the second row you see the placement of a new piece.

The image at the left shows the final result.

Notice that the ink is water-proof. Traditional water-based ink would not hold if it made contact with water.

POP signage and mesh for windows are other applications possible with Latex ink.

Applications samples of latex inks: Designjet L65500 at HP Demo Center in Barcelona 2009.

A printhead that produces a drop size of 12pl, such as the head used in the HP Scitex LX600, is appropriate to reproduce art.

Image Quality Issues Relative to Applications

103. How good is the adhesion of the ink?
When I visit a trade show on most materials the ink does not scratch off the material.

104. What about solvents such as cleaning solvents? Do they mar, dull, or wash away the ink or change the surface quality?
- Windex – Ammonia
- Acetone
- Cleaning alcohol
- Gasoline
- Soap and water
- Scotch-tape pull-off test

105. Is misting observable?
The way you can tell whether your printer has an issue with misting is to put a white napkin inside the printer. See if it turns colors from ink mist landing on it.

Or, look under the media edge guard. If the area to the right (where mist can land) has a faint barely perceptible gray or other light color, that is misting ink that has landed there.

Misting is common with UV-cured printer systems, indeed misting is heavy on a few models. But no misting would be expected with this HP latex printer

RIP SOFTWARE

106. Is a RIP included?
No RIP is included.

107. Is a computer and monitor included (to run the RIP)?
You need to buy a separate computer to run a RIP to handle this printer.

108. Is this RIP fine tuned for this printer in particular?
Yes, any RIP for latex ink must be very special. This has been one of the most unique inks that any wide-format RIP software has ever attempted to handle. It has taken the RIP developers most effort than for any other ink.

One issue is the ink chemistry and curing per se; another aspect may be the competition between which software will control things: the HP firmware guided by its on-board system; or a color management system with a separate spectrophotometer.

PRODUCTIVITY & ROI (Return on Investment)

109. What is the level of productivity, high, medium, low?

Because the heat must dwell over the material a few seconds, the productivity of the initial models is not setting speed records. But the same with Sepiax ink; the first printers are not setting speed records either. But when newer models (of anything) come out, the new models are generally less slow.

ADVERTISING CLAIMS: Anything Misleading? Any Hype? Slight Exaggeration?

110. Please look at the ad claims for this printer in magazines and on the internet. What aspects of these ads will a buyer of that model soon find out are perhaps slightly exaggerated? In some ads it seems to be the goal to list as outstanding features precisely where the printer is weak. After all, once we buy your printer we are going to find out about these discrepancies relatively quickly: metamerism on some models; slowness on most models; banding defects; inability to print on after-market media; small ink cartridges combined with high cost of consumables, etc.

Printer	Draft speed (useless due to low quality in most cases)	Quoted speeds in spec sheets	Quoted speeds in spec sheets	Top quality, but thus naturally lowest productivity
HP LX600	157 m /hour	39 m /hour, 6 pass	23 m /hour, 10 pass	Skillfully not quoted in HP spec sheet
HP LX800				
DGI 3.2 m				
Seiko H104s				
Roland AJ				

The claim that “Print on low-cost uncoated papers…. Solvent printers require more expensive coated papers to achieve the same results.” Is dubious at best and I fail to understand why anyone would make such an undocumented claim.
First, DuPont Tyvek must be coated to use with. But for Sepiax resin ink, uncoated Tyvek is fine.

Clearly whoever wrote this claim has no knowledge of Sepiax ink, or if so, is skillfully hiding his or her knowledge of resin ink.

But the purpose of solvent ink is precisely to print on cheap uncoated material. Indeed, most solvent printers can print on the absolute cheapest Chinese PVC. But cheap junk from Asia would probably melt or deform inside an HP Scitex LX600 or LX800 printer.

None of these problems with HP latex ink would have been noticeable if the spec sheets and brochures had not exaggerated so much. The HP Scitex latex printers are great. Just that their greatness is limited. They do many things fine, but by no means whatsoever do everything perfectly (nor does any other printer or any other ink).

111. How would end-user describe this printer? Easy to use, takes care of itself, does not require you to personally become a repair or maintenance technician?
HP makes sure that their printers are easy to use and that the printers have their own mechanism to take care of themselves, within reason.

112. How often do people return this printer and say they want their money back?
I have now heard of two cases of buyers who were very disenchanted. One said “it was a disaster” The other was upset that the 60” version was not adequate for producing giclee, but frankly you would have to be pretty naïve to think this kind of ink could do giclee. In both cases the dissatisfaction was because the millions of dollars in PR have mesmerized people about the eco-green message.

Like people In some religious cult, they have not thought things through on their own. They buy the printer and only once they have it do the find it is not created by some green deity, but it is simply a machine with one kind of ink for a limited range of tasks.

The printshops that are happy are those whose clients fit nicely into the limited range of tasks. The unenchanted owners are the ones who were bamboozled by the mantry of green this, green that, eco-this, eco-that, and then found that the machine, as a machine, had limitations.

It is reported that printshop owners in Japan are especially disenchanted, and a few in Taiway perhaps also.

GENERAL CONSIDERATIONS

113. What will the resale value of your printer be in three to five years? When you buy a printer nowadays, people easily forget to ask what the resale value will be in three to five years. When you buy a printer nowadays, people easily forget to ask what the resale value will be in three to five years.

So a good question is, will either the brand name or model specifications cause a knowing buyer three years from now to shy away from your printer or cause a knowing buyer to only want to pay a very low price as compared to the other printers our company is considering?

A company which is no longer in business may cause printers of that brand to lose value in the used market. A company which has filed for bankruptcy (irrespective of what other legal jargon they use, to the normal person, if a company does not pay its bills, it is considered effectively bankrupt). It is possible that such a printer brand could lose value when offered used.

Well HP will certainly still be in business, so the corporate aspect will not influence sales value as used in three to five years. But since resin water-based printers are already being developed elsewhere, in three to five years printshops will want a resin printer, not a used vintage 2009-2010 latex printer.

So I would not count on much of a high resale value used in three years. If you sell your HP printer now you can probably get your money back (since we assume you have made some profit selling print jobs since the day it was installed). But you better hurry because by SGIA 2010 the new printers will be announced (I am not sure the new printers will be leaked by FESPA).

114. Another question is to ask, is there some major technological breakthrough in your market applications that will result in less value for your current model?

Yes, we tried to hint this in the answer above. In 2009 latex was king. By 2010 doubts have set in. By 2011 there will be so much new ink technology elsewhere that latex ink will be in their shadow. Note: this does not at all mean you should hold off. This does not mean you should not buy an HP latex printer.

There is today no 104" Sepiax printer (it is unsure whether Sepiax ink would work in the Seiko printheads of the Roland AdvancedJet).

COMPARISONS WITH OTHER PRINTERS

115. If you are dissatisfied, what about the advertising or other claims made you buy this in the beginning, and why do you now feel disillusioned?

The word disallusionment is what I am increasingly hearing. This is sad, because what caused it is NOT a bad or inadequate printer. What caused disallusionment is excessive claims in the advertising brochures, and too much smoke-and-mirrors about the ecology and environmental friendliness.

I would bet that if any printshop actually measured how much electricity each individual printer used, they would be shocked. But I doubt if any printshop owner or even manager really is aware of the actual cost of electricity-per-printer-per-hour. So it is other aspects that cause people to feel disappointed: mainly the media restrictions, the fact the ink is a monopoly, and there is not much flexibility.

116. When people are considering buying this printer, what other printer(s) are they also looking at?

In 2008 and 2009 the choice was between HP latex and solvent printers and UV-cured roll-to-roll printers. For 2010 printshop owners now have to decide whether a resin ink printer may be better for them.

117. What features on the other printers turn them off?

Presently there are no heavy-duty production level printers made from the ground up to work with Sepiax ink. But the 104" HP latex ink printer is the result of years of experience between HP Designjet and HP Scitex. So with the L65500 you have a chassis and structure and ink delivery system designed exclusively for the latex ink.

SUMMARY: Image Quality Issues Relative to Applications

118. What about the dot pattern? Is the image grainy (like sand) or is the image smooth as you would expect of a photograph?

Image is smooth; no graininess (UV-inks are grainy like sand sometimes).

119. What about splotchiness (mottle)?

No mottle.

Conclusions

Pros

A significant benefit of the HP Scitex LX600 and LX800 printers are that the prints are more than dry to the touch, they are fully cured when they come out of the printer. There is no overnight curing needed.

With solvent inks, and also with Sepiax ink, the prints take 24 hours to fully dry (though you can laminate Sepiax after it comes out; with solvent you need to wait). However Sepiax ink offers so many other advantages (over solvent and latex ink) that the occasional issue should be weighed with the benefits

Has a glossary in the User Manual, a nice feature that is seldom available for other printers. The manual also has a basic index at the back.

The section on applications (actually on how to handle the substrates) is really user-friendly. It is arranged almost in glossary format: very easy to understand. The author of this section deserves a compliment (pages. 13-14).

HP thermal printhead technology has several advantages over piezo technology.

The structure of the printer is professionally engineered. This is a serious machine from the ground up.

There is now a good choice between 104” and 126” widths.

The inclusion of applications in the HP LX600 data sheet is well done. I like the use of real-world applications (instead of exaggerated claims of eco-greeness and claims of how much better the ink supposed is than solvent or anything else; most of those claims vary from exaggerated to simply untrue).

The one claim of HP that I accept is the fact that wallpaper printed with HP latex ink is less offensive smell than wallpaper printed with solvent or UV-cured ink. We will assume that Sepiax resin ink can print on all wallpapers also, and equally with minimal odor, but no one who was writing the HP material seems to be aware of resin ink.

The availability of a trough for catching ink that may pass through a fabric is an important feature.

Plus or minus, depending on how you weigh the situation

Page 24 is the most blunt reality check of the entire printer. This is a completely honest and precise description of everything that may happen if the temperatures are a bit too low or a bit too high for drying zone, curing zone as well as vacuum pressure and tension (feeding the material through the system).

Here is where if you read only this one page you would be skeptical, But I have spoken personally with two experienced users of this printer, and either they had gone beyond these issues or maybe because they

At one trade show the images looked uninspiring; lacked POP and shadow areas lacked detail. But perhaps the ink limit was inadequately set.

In this same trade show the colors were not very good either: turquoise water in a resort photo looked simply bizarre. Most yellows were either dirty or a bit green (surprisingly like UV-ink yellow issues).

Reds were too orange (again, like UV cured reds).

Blue and Cyan were oversaturated (again, like UV-cured inks). Is the extreme heat of latex ink curing and the extreme UV-curing lamp temperatures causing these minute color changes?

The spec sheet claims that printing directly to polyester with HP latex inks is superior to traditional dye sublimation. But the spec sheet conveniently and skillfully neglects to say whether HP latex ink can produce the POP of traditional dye sublimation. Note: full dye sub (via transfer paper) usually has more pop than direct-to-fabric disperse dye ink.

It would also be interesting to compare longevity of HP latex ink on polyester compared to either disperse dye or dye sublimation inks. Dye inks have notoriously short life-span outside in the sun.

A potential downside is mentioned in fine-print: "polyester fabric that does not stretch…" Whether this means you can use only expensive polyester remains to be seen. Most dedicated dye sub printers have a transport system made specifically for polyester fabric. However the feed and take-up system of the HP latex printers is a basic system, not made for fabric.

Downsides

I can understand PR release kind of happy claims in a PR release, but once you have the printer in your printshop, it would be best to abandon PR claims and stick with the reality that the printer operator, manager, and printshop owner will find out very quickly. Claiming the printer prints on lots of materials is weak at best and is the most disputed aspect of latex ink. Frankly this claim merely invites counter-arguments, so in the User Manual I would suggest this claim be removed. And in the User Manual is the place to list with justifiable pride what media and materials the latex ink can print on, and be up front and open about what media and substrates the latex ink is not appropriate on.

Every solvent, UV-curable, and eco-solvent printer manufacturer is already (at SGIA 2009) already loudly singling out the restricted media as something their eco-solvent printers are not subjected to. Personally I feel if this reality were faced head on, it would have removed the incentive for every single mild-solvent, lite-solvent, and eco-solvent printer manufacturer from warning every single solitary person who came into their booth (I also got lambasted about this at VISCOM Duesseldorf, where the popular smaller sizes of HP L25500 were launched the week before SGIA).

Electrical requirements are a bit intimidating in some countries and in remote areas especially.

I do not see any test results for hazardous chemicals released by printing on cheap Chinese PVC or other really cheap Asian media. All the test results are for the ink alone. But the resulting prints are a combination of ink PLUS substrate. PVC has many nasty chemicals in it, and cheaper PVC who knows what's inside. So it would be helpful to see test results on what chemicals are released into the air by heating cheap PVC to 100 degrees C.

And more information on the odor from such over-heated media would also be helpful.

Several people have pointed out that the ink is relatively matte, and not glossy. Seiko ColorPainter defines the beauty of glossy pop in a signage ink, especially for black. Latex ink is not able to achieve a "Seiko gloss."

Thus I find the advertising claim in the HP spec sheet, "comparable to low-solvent ink technology—for rich hues and vibrant tones" as unrealistic. I am not sure that claim is true at all. The image quality itself is great, just that it's not as bright and colorful as low-solvent.

Go to any major Chinese signage printer show, such as Dongguan, Guangzhou, or Shanghai APPPEXPO, and you will see stunning displays of bright colors with diverse kinds of solvent ink. Where is this kind of POP and gorgeous color saturation in any latex ink booth?

But if your clients prefer satin (which is a bit less than gloss), and if the substrate itself is glossy, you can indeed obtain a nice image with the HP Scitex LX600 and LX800. But yu can obtain the same, or better, with most solvent ink printers (eco, mild, low, light, and full).

Commentary

While at Japan Shop expo in Tokyo, March 2010, it was possible to get considerable insight into HP latex ink obstacles in the Japanese market. The comments were from a knowledgable and experienced person in the Asian world area. He was neither HP nor a competitor of HP, so his comments have even more credibility.

He said that in general print shop owners in Asia had more expectations, and frankly were disappointed that the printer could not do more.

"Cheaper vinyl starts shrinking at 75 to 80 degrees C."
"There is no cheap media available"

PVC is okay uncoated but most other media requires coatings, which increases cost.

Clear polyester media gets scratched by the "needles" that are in S shape on the platen. These pins may scratch the underside of the media. You have to put fabric or mesh across the platen to avoid scratching.

Blueback paper can't be waterproof.

Lighter browns not good.

Some green colors not good.

The validity of the observations were clear because this source also made positive comments on the printer: "it has good precise feeding." And, "HP latex ink is excellent for backlit. It "can replace Lamda""

But he concluded that latex ink sales in Japan and Taiwan would unlikely be a runaway success because of limitations. He said again that "expectations were too high."

Reading between the lines: PR releases from HP were too juicy and promised too much. Now you see why FLAAR makes no effort to become a PR agency. We prefer to list the reality of a printer, and not rosy promises that perhaps are unrealistic.

Another feature of every single HP PR release on this printer is the constant claim of being better than solvent, eco-solvent or mild-solvent (light or lite-solvent). But nowhere is there any hint that anyone who wrote a single word of these spec sheets was aware whatsoever of water-based resin inks from other sources.

It is as if the latex ink spec sheets were frozen in time back to 2008 (Sepiax ink was first shown to an international public at FESPA Digital Geneva, summer 2008, before DRUPA that year). Sepiax ink was launched officially in the USA at Graphics of the Americas in Miami in early 2010 and again at ISA in the Spring. There was a further launch at Sign & Digital UK 2010.

So the total absence of any recognition of this other water-based resin ink is strange, especially since no HP latex ink can (yet) print on thick or rigid material. Sepiax ink is adept at this: solid metal, ceramic tiles, wood, etc.

It is noteworthy that no trade magazine has dared say anything that is not an HP-style PR release or Success Story about the latex printers. So the main advantage of the FLAAR Reports is that for the first time you can really see the pros and cons of latex ink.

And most importantly, this is the first outside review of the advertising claims for latex ink.

Yet we do not feel it is appropriate to recommend not buying this printer. Our purpose is to alert the printshop owner, manager and printer operator to a bit more of the reality check of the occasional limitations of latex ink.

The advantage of this FLAAR Report is that now, for printshops who do prefer HP latex ink and the HP Scitex solution and support, that they will be better prepared for the few things that the printer can't do. So hopefully the owners will be more content with their purchase of the HP Scitex latex printers.

Every printshop has different needs; different applications. For some the HP latex ink printer is the best available in 2010. As new printers come out with other water-based resin inks, this will change, but these changes will not happen until either very late in 2010 or more likely during 2011. If you need a latex ink printer now, today (summer 2010), there is not yet any production printer at 3.2 meter width or even at 104 inches that can use other resin inks.

First prepared November 2009, but not issued until May 2010 because we wished to learn more about the printer from both end-users and from industry analysts. So between November and May there have been numerous updates.

If you purchased this 1st Edition, you can request the eventual updated 2nd edition at no cost. Just send an e-mail to accounting@FLAAR.org and indicate approximately when you bought the 1st edition. Please wait until you see comments on the FLAAR web sites that a 2nd edition is available.

Reality Check

Being a university professor for many years does not mean we know everything. But intellectual curiosity often leads us to enter areas that are new to us. So we do not shirk from entering areas where we are obviously not yet expert. If in your years of wide format printing experience have encountered results different 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, because since we are not dependent on sales commissions we can openly list the glitches and defects of those printers that have an occasional problem.

FLAAR and most universities 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 53,000 of our many readers who have shared their experiences with us via e-mail (the Survey Forms).

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

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

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

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

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

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

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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, often turns out to be a need of more operator experience and training. More often than not, after learning more about the product it becomes possible to produce what it was intended to produce. For this reason it is crucial for the FLAAR team and their university colleagues to interact with the manufacturer's training center and technicians, so we know more about a hardware or software. Our evaluations go through a process of acquiring documentation from a wide range of resources and these naturally include the manufacturer itself. Obviously we take their viewpoints with a grain of salt but often we learn tips that are worthy of being passed along.

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

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

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

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

But even when we like a product and recommend it, we still can't guarantee or certify any make or model nor its profitability in use because we don't know the conditions under which a printer system might be utilized in someone else's facility. For ink and media, especially after-market third-party ink and media, it is essential that you test it first, under your conditions. We have no way to assure that

any ink or media will be acceptable for your specific needs in your specific print shop. As a result, products are described "as is" and without warranties as to performance or merchantability, or of fitness for a particular purpose. Any such statements in our reports or on our web sites or in discussions do not constitute warranties and shall not be relied on by the buyer in deciding whether to purchase and/or use products we discuss because of the diversity of conditions, materials and/or equipment under which these products may be used. Thus please recognize that no warranty of fitness or profitability for a particular purpose is offered.

It is also crucial to realize that an ink (that we inspect, that works well where we inspect it), your printer, your printhead, the heat, humidity and dust conditions in your printshop, may cause that ink to react differently in your printer. And, there are different batches of ink. Even in the really big multi-national billion-dollar ink companies, occasionally one batch will have issues. There are over 100 ink companies; six colors per company, many flavors of ink per company per color. We have no realistic manner of testing each ink. The same is true of media and substrates. One production run can have a glitch: chemical or physical, even in the best of companies. A major Swiss-owned media company, for example, had several months of media which were almost unusable. Yet other kinds of media from the same company are okay (though we stopped using that brand and stopped recommending them after all the issues we ourselves experienced).

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. Plus, there is no way to know if all MSDS sheets are honest to begin with! Our reports are on usability, not on health hazards.

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

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

Results you see at trade shows may not be realistic

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

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

Booth personnel have many standard tricks that they use to make their output look gorgeous. In about half the cases you will not likely obtain these results in real life: in most cases they are printing unidirectional, 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.

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

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

Factors influencing output

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

Actually you may have people with even more experience than we do, since we deliberately use students to approximate newbies. FLAAR is devoted to assisting newcomers learn about digital imaging hard-

ware 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. Please be aware that our comments or evaluations on any after-market ink would need the end-user to use customized ICC profiles (and not merely generic profiles).

Be aware that some RIPs can only accept ICC color profiles: you quickly find out the hard way that you can't tweak these profiles nor generate new ones. So be sure to get a RIP which can handle all aspects of color management. Many RIPs come in different levels. You may buy one level and be disappointed that the RIP won't do everything. That's because those features you may be lacking are available only in the next level higher of that RIP, often at considerable extra cost. Same thing in the progression of Chevy through Pontiac to Cadillac, or the new Suburbans. A Chevy Suburban simply does not have all the bells and whistles of the Cadillac Escalade version of this SUV.

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

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

Just remember that every machine has quirks, even the ones we like. It is possible that the particular kind of images, resolution, inks, media, or other factors in your facility are sufficiently different than in ours that a printer which works just fine for us may be totally unsatisfactory for you and your clients. However it may be that the specific kind of printing you need to do may never occasion that shortcoming. Or, it may be that your printer was manufactured on a Monday and has defects that are atypical, show up more in the kind of media you use which we may not use as often or at all during our evaluations. Equally possibly a printer that was a disaster for someone else may work flawlessly for you and be a real money maker for your company.
So if we inspect a printer in a printshop (a site-visit case study), and that owner/operator is content with their printer and we mention this; don't expect that you will automatically get the same results in your own printshop.

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

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

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

The major causes of printer breakdown and failure is lack of maintenance, poor maintenance, spotty maintenance, or trying to jerry-rig some part of the printer. The equally common cause of printer breakdown is improper use, generally due from lack of training or experience. Another factor is whether you utilize your printer all day every day. Most solvent and UV printers work best if used frequently. If you are not going to use your printer for two or three days, you have to put flush into the system and prepare it for hibernation (even if for only four or five days). Then you have to flush the ink system all over again.

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

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

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

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

Yes, it is rather self-evident that we would never ask a manufacturer to send a product which we knew in advance from our studies was no

good. But there are a few other printers which are great but we simply do not have them in our facilities yet.

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

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

Taking into consideration we do not know the conditions in which you may be using your hardware, software, or consumables, neither the author nor FLAAR nor either university is liable for liability, loss or damage caused either directly or indirectly by the suggestions in this report nor by hardware, software, or techniques described herein because.

Availability of spare parts may be a significant issue

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

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

Lack of Tech Support Personnel is increasing

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

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

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

Counterfeit parts are a problem with many printers made in China

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

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

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

It is typical for some enthusiastic vendors to claim verbally that their printer can print on anything and everything. But once you unpack the printer and set it up, you find that it requires primer on some materials; on other materials it adheres for a few weeks but then falls off.
And on most hybrid and many combo printers, some heavy, thick, or smooth-surfaced materials skew badly. Since the claim that the printer will print on everything is usually verbal, it is tough to prove this aspect of misleading advertising to a jury.

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

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

Be sure to check all FLAAR resources

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

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

Acknowledgements

With 19 employees the funding has to come from somewhere, so we do welcome project sponsorship, research grants, contributions that facilitate our educational programs, scholarships for co-op interns

and graduate students, and comparable project-oriented funding from manufacturers. The benefit for the end-user is a principle called academic freedom, in this case,

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

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

Besides, it does not take any money to see which printers and RIPs function as advertised and which don't. We saw one hyped printer grind to a halt, malfunction, or otherwise publicly display its 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 in past years and for funds to allow us to attend all major international trade shows, which are ideal locations for us to gather information. We thank Caldera, EskoArtwork, EFI Rastek, EFI and VUTEk, OTF (Obeikan), Drytac DigiFab, Barbieri electronic, Seiko II, Parrot Digigraphic, AT Inks, Sepiax inks, Sam-Ink, Dilli, Grapo, and WP Digital for providing funds so that we can make more of our publications free to end-users. During 2000-2001 we had grants to cover all the costs of our publications, and all FLAAR Reports were free in those early years. As that early grant naturally expired after a few years, we had to begin charging for some of our reports to cover costs. Now (in 2010), we are seeking corporate sponsorship so we can gradually make another 20% of our publications free to our readers.

Since 2006 we do a major part of our evaluations at a factory and headquarters demo room. Since the university does not fund any of these trips, it is traditional for the manufacturer to fund a research sponsorship. In the US this is how most university projects are initiated for decades now, and it is increasing. In fact there is a university in Austria that is not an "edu" but is a "GmbH", funded by the chamber of commerce of that part of Austria. In other words, a university as an educational institution, but functioning in the real world as an actual business. This is a sensible model, especially when FLAAR staff need to be on the road over a quarter of a million miles per year (roughly over 400,000 km per year total for the staff). Obviously this travel is hosted since unless money falls from heaven there most realistic way to obtain funding to get to the demo rooms for training is direct from the source.

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

Barbieri electronic (color management), Caldera (RIP), ColorSpan, DEC, Durst, EFI, EskoArtwork, Gerber, Grapo, IP&I, Mimaki USA, Mutoh, Obeikan, Dilli, Drytac, GCC, NUR, Oce, Shiraz (RIP), Sky AirShip, Sun, Teckwin, VUTEk, WP Digital, Xerox, Yuhan-Kimberly, Zund have each brought FLAAR staff to their headquarters and printer factories. AT Inks, Bordeaux, InkWin, Sepiax, Sam-Ink, and Sunflower ink have brought us to inspect their ink manufacturing facilities and demo rooms. Notice that we interact with a wide range of companies: it is more helpful to our readers when we interact with many different companies rather than just one.

We have visited the world headquarters and demo rooms of HP in Barcelona and received informative and helpful technology briefings

from HP about every two years. 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 access to their digital equipment, also for providing three different models of Epson inkjet printers to our facilities on loan at BGSU (5500, 7600, 7800). We thank Mimaki USA for providing a JV4 and then a Mimaki TX-1600s textile printer and Improved Technologies (ITNH) providing their Ixia model of the Iris 3047 giclee printer.

We thank 3P Inkjet Textiles and HP for providing inkjet textiles so we could learn about the different results on the various textiles. IJ Technologies, 3P Inkjet Textiles, ColorSpan, Encad, HP, Nan Ya Pepa, Oracal, Tara and other companies have provided inkjet media so we can try it out and see how it works (or not as the case may be; several inkjet media failed miserably, one from Taiwan, the other evidently from Germany!). We thank Aurelon, Canon, ColorGate, ColorSpan, ErgoSoft, HP, PerfectProof, PosterJet, Onyx, Ilford, CSE ColorBurst, ScanvecAmiable, Wasatch and many other RIP companies for providing their hardware and software RIPs.

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

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

We really liked some of the results whereas some of the other products were a bit disappointing. Providing samples does not influence the evaluations because the evaluators are students, professors, and staff of Bowling Green State University. These personnel are not hired by any inkjet printer company; they were universities employees (as was also true for Nicholas Hellmuth). The testing person for the HP ColorPro (desktop printer) said he frankly preferred his Epson printer. When we saw the rest results we did not include this Hewelett-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 three manufacturers of piezo printers (Epson, Seiko, Mutoh, and Mimaki). This is because piezo has definite advantage for some applications; thermal printheads have advantages

in different applications. Our reviews have universal appeal precisely because we feature all competing printhead technologies. Every printer, RIPs, inks, or media we have reviewed have good points in addition to weaknesses. Both X-Rite and competitor GretagMacbeth provided spectrophotometers. Again, when all sides assist this program there is no incentive to favor one by trashing the other. Printer manufacturer ad campaigns are their own worst enemy. If a printer did not make false and misleading claims, then we would have nothing to fill our reviews with refuting the utter nonsense that is foisted on the buying public.

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

An evaluation is a professional service, and at FLAAR is based on more than 11 years of experience. An evaluation of a printer, an ink, media, substrate, a software, laminator, cutter or whatever part of the digital printing workflow is intended to provide feedback to all sides. The manufacturers appreciate learning from FLAAR what features of their printers need improvement. In probably half the manufacturers FLAAR has dealt with, people inside the company did not, themselves, want to tell their boss that their pet printer was a dog. So printer, software, and component manufacturers have learned that investing in a FLAAR evaluation of their product provides them with useful return on investment. Of course if a printer manufacturer wants only a slick Success Story, or what we call a "suck up review" that simply panders to the manufacturer, obviously FLAAR is not a good place to dare to ask for such a review. In several instances it was FLAAR Reports that allowed a company to either improve their printer, or drop it and start from scratch and design a new and better one.

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

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

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

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

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

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

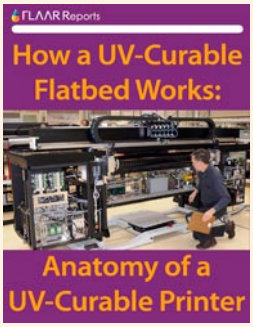
A modest portion of our income comes from our readers who purchase the FLAAR series. All income helps continue our tradition of independent evaluations and reviews of inkjet printers, RIPs, media, inks, cutters, laminators, and color management systems.

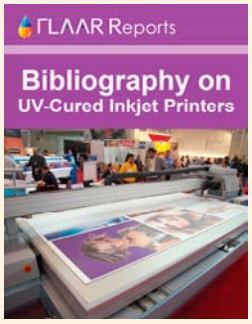
These are some of the most

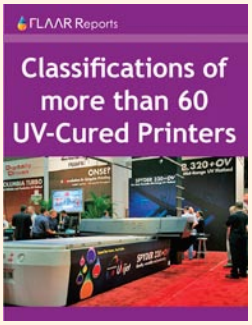
Recent FLAAR Reports (2008-2010)

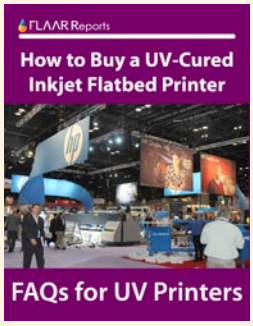
You can find these and more reports at: www.wide-format-printers.NET

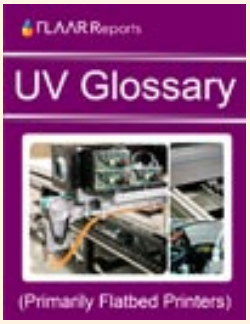
Introduction to UV Curable Inkjet Flatbed Printers

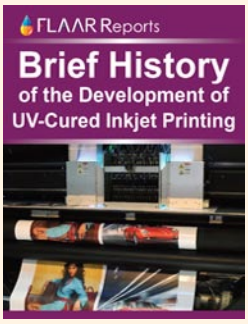


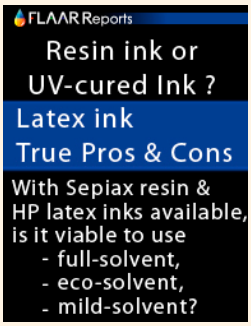


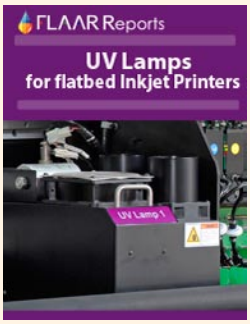


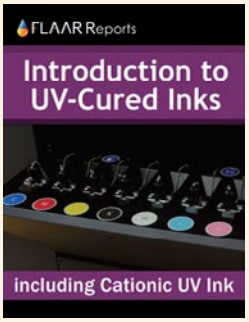




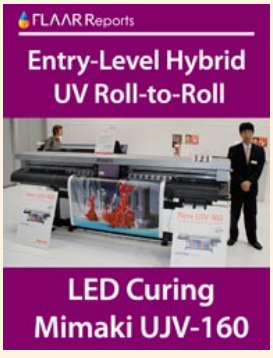








Most recent UV Printers



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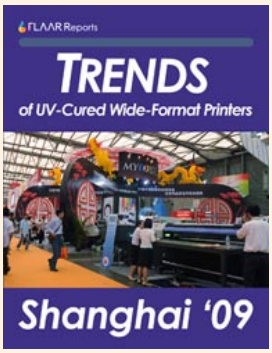
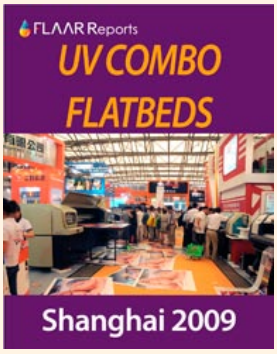
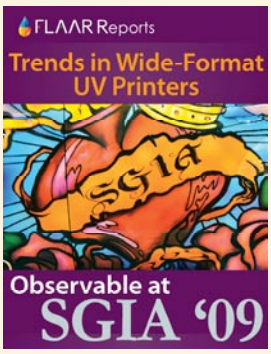
Comments on UV Inkjet Printers at Major Trade Shows 2007-2009







UV Printers Manufactured in China, Korea and Taiwan