Fine-Art Photo and Giclee Printer
Evaluation & Review

HP Designjet Z3200ps

Nicholas Hellmuth, Eduardo Sacayon, Jose Melgar

Contents

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HP Designjet Z3200ps Photo Printer

Wide Format Inkjet Printer

Buyer's Guide in FAQs Format

THE BASICS

1. Brand name, model?
HP Designjet Z3200ps Photo. There is a secondary identification code: Q6721A. This is the most complete printer from the Designjet Z series

2. If there are two or three (or more) widths of this printer, what differences exist other than the width?
There are four variations of this model that can be divided into
- HP Z3200 (24")
- HPZ3200 (44")
- HP Z3200ps (24")
- HPZ3200ps (44")

The difference between a basic model and a "ps" model has to do with file format handling capabilities. The language supported in the ps model are
- PCL3GUI,
- Adobe PS level 3,
- HP-GL/2,
- Adobe PDF 1.6,
- TIFF,
- JPEG,

The base model supports only
- PCL3GUI
- Adobe PS level 3
- HP-GL/2.

Also the ps models come with a RIP, 80 GB internal hard drive, the Advanced Profiling Solution (APS), which includes an i1 Display colorimeter for monitor calibration.

The base model requires an external RIP.

This evaluation is based on the most complete version of these series, the HP Designjet Z3200ps. Here, two models at Parrot Digigraphic.

3. What is the nature of the company behind the brand name? Is this company the manufacturer, distributor, or rebranding?

HP is the original manufacturer of this model. The company has several other industrial printers but those are from Scitex, NUR, and ColorSpan (printer manufacturers that have been acquired in recent years by HP).

4. Is this same model(s) rebranded and sold under other names?

No. So far HP is the only manufacturer and distributor.

5. What other printers are the same or similar chassis from this manufacturer or distributor?

This series is based on the original HP Designjet Z3100 series. There is another printer that has a similar chassis, the HP Designjet Z2100 series, and on the HP web site they list a HP Designjet Z6100 but this is not a dedicated giclée printer (we prefer more than eight colors to be accepted as giclee).

6. Is this printer mature technology or still in alpha-stage or beta-stage?

This is a mature printer, already out of all the preliminary stages, especially because it is a next generation of the Z3100, which has already been discontinued.

The printer comes with a starter set of ink cartridges. Including the new Chromatic Red Vivera ink.

7. List price?

$6,795.00 is the price for the full model that you see in these photographs.

i1 Display colorimeter. Monitor calibration is essential to obtain image fidelity.

8. What is the street price?

Street price varies; if you buy from a box-pusher you don't get service or tech support. If you wish to have a person that knows printers, fine art photography, and giclee, then it is recommended to consider a value-added dealer (the one we know the best is Parrot Digigraphic, www.parrotcolor.com.

9. What comes with the printer: stand, network connection already installed, take-up reel?

• The printer comes with
• Own stand,
• Network card Ethernet 10/100
• Three different types of power cord, for three different world regions
• Advanced Profiling Solution with the i1 Display colorimeter
• Small 24" satin photo paper media roll
• 12 printheads
• 12 ink cartridges
• 80 GB hard drive
• RIP
• Screw driver and 24 screws to assembly the stand to the printer.

There is no take-up reel in this model, but instead a foldable basket to receive the printouts.

10. What accessories are extra charge? Are these same or similar accessories included with other printers at no extra cost? Explain why this is any different than selling a car without tires, or a computer without a monitor?

In the ps models the Eye One spectrophotometer (for monitor calibration) is included, in the base models you can purchase it from HP.

11. What other costs are involved?

You obviously need to buy your own rolls of media if you want to start printing. The initial 24" is for primarily intended for initial printer calibrations. Once the calibration was complete we could only print 5 24"x18" photos.

12. Does a complete set of full-sized ink cartridges come with the new printer, or merely a "starter set" that is not as full as a regular set?
No, you receive a starter set of twelve 69ml ink cartridges. The ink we got was packed in its original packing material, we where the first to open it.

13. What other equipment is needed to operate this printer? For example, does this printer include its own power line conditioner? Do you need an uninterruptible power supply (UPS)?
A UPS unit would be advisable, especially in locations where electricity is not constant. We are using a Sola MCR 1000 power line conditioner to protect the printer.

14. Is it recommended, or required, to buy a spare parts kit? Or extra printheads?
A spare parts kit is not necessary. User replaceable printheads are available for approximately $70 each (two colors per printhead = 6 printheads). The printheads include a warranty, which lasts until the "Warranty Ends" date has been reached or the warranted usage limit of 1000ml has been reached, whichever occurs first. The printers display provides usage and warranty information through the on board LCD screen. HP will replace the printhead at no charge within the warranty period. It is recommended that production environments stock extra printheads on site to avoid downtime.

15. How does the total cost compare with other Inkjet printers?
A Canon iPF 8100, which is also a 44" model is around $6,295, which is $500 less than the advertised price for the Designjet Z3200ps. BUT…. the i1 Display colorimeter, Advanced Profiling Solution and Postscript RIP cost a lot more than the price difference. Plus, HP has many years experience in making fine art photography and giclee printers.

The Epson 9880 is also a 44-inch printer. It uses 8 ink cartridges and the price for the standard model is around $4,995. The ColorBurst version (meaning a version that has a RIP) has an estimated price of $5,995. You also have to realize that some on-board RIPs are most politely known as lite versions. And, worse, some lite RIP software versions, when provided as a printer bundle, cannot easily or economically be upgraded to a full version. They also can require a separate computer to operate efficiently.

PURCHASING

16. 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 for HP printers (in the US) come in every size and shape. Several are national (selling all across the USA; again, the one that we know best is Parrot Digigraphic, www.ParrotColor.com). Some are local. But the main difference is with box-pushers (you get a box and that's about it), or value-added (you get service and tech support and help in applications). A box pusher has no awareness of the entire workflow and has no actual digitization equipment in-house. In effect, you get a lower cost printer (from a box pusher) but when you seek help, you are in no position to be taught because the full-featured resources are not the ones you started with.

The printer comes with a wheeled stand and a basket to receive media.

17. What kinds of leasing or other financing are available?
HP has several financing/leasing programs, such as Economic Recovery lease, Pay as you Grow. Acquire now, pay later.

SET-UP OF THE PRINTER: PRACTICAL CONSIDERATIONS

18. What are the electrical requirements of this printer?
The Z3200 is world-wide power compatible with an autoranging input voltage of 100 to 240 V ac (+/- 10%), 50/60 Hz (+/- 3 Hz), 2 amps max. The model at the FLAAR office has a plug similar to that in any other domestic appliance in America (North America or Latin America).

19. What kind of exhaust system is either required, or if not required, what would common sense dictate?

There is no need for an exhaust system, since the printer does not emit considerable amounts of heat nor smell.

20. What is the connectivity? Network, SCSI, FireWire, or other?
- 1000Base-T Ethernet RJ-45 port
- Hi-Speed USB 2.0 certified port
- EIO Jetdirect accessory slot

21. What about altitude? Some cities such as Guatemala City are at a high altitude?

Not a problem, for the city where FLAAR is located we are at 1500 meters/5000 feet above sea level.

22. What about dust and cleanliness of the air?

Not an issue with this printer, and Guatemala occasionally has volcanic ash in the air from constant eruptions (you can see an erupting volcano from the window of the FLAAR office). But prints should be handled with care as any other fine art print.

Instructions to assemble the stand are clear. As mentioned earlier, the printer comes with its own screw driver.

23. Realistically, how much surrounding and support space will the equipment need in addition to the machine's own footprint.?

The printer will occupy at least 1x2 meters, but you will need a table or some space to place the prints once they are out of the printer.

24. What is the size and weight of the printer?

WxDxH = 69.7 x 27.2 x 41.2 in. Weight is 189 lb.

25. How many boxes arrive?

Just one big box with everything inside

26. How big are the boxes?

A little bigger than the printer WXDXH = 69.7 x 27.2 x 41.2 in

27. Does the printer come in one piece?

No, the base or stand comes unassembled. After you put the stand together it has to be attached to the printer.

28. How much assembly is required?

Not much really, only the stand has to be assembled.

29. What comes in the box (and which is in which box)?
- HP Designjet Z3200ps 44-in Photo Printer,
- Spindle,
- Printheads (6 x 2 colors each),
- Introductory ink cartridges (x12),
- Original HP media roll, stand (44 in),
- Rear tray (44 in),
- Adaptor kit (3 in) for spindle (x2),
- Quick reference guide,
- Setup poster,
- USB cable,
- Power cord,
- HP Start-up kit including printer software,
- HP Advanced Profiling Solution

The assembly instructions suggest at least 3 persons to unpack the printer, but you will need at least 4 persons to carry the box. Cindy Contreras, FLAAR webmaster and technical writer evaluating the printers at Parrot Digigraphic.

30. What is setup of the printer like?
Easy, not much thinking to do more than follow instructions.

INSTALLATION OF THE PRINTER

31. Can you install this printer yourself?
Yes.

32. How many people does it take to lift the box?
The help of 4 persons is needed to move it.

33. How many people does it take to lift the printer out of the box?
3 persons.

34. Realistically, what expenses must you incur for the installation, such as a fork-lift truck or crane to lift the printer off the truck?
If shipment is not included, you will need to cover shipment and movers if you do not have friends to ask for help.

The Quick Reference Guide comes in English, French, Spanish and Portuguese.

35. Is installation included in the purchase price?
Typically, installation is offered by value added integrators for a charge. This is because if you have prior experience, you should be able to install this HP printer yourself. But if you do not wish to spend a day with several friends to carry and set it up, then ask your value-added reseller to install it for you.

INSTALLATION OF THE PRINTER: INSTRUCTIONS & MANUALS

36. How many manuals are available?
The printer came with a start up kit CD, which has some of the manuals, assembly instructions and a quick reference guide.

37. Which manuals are hard-copy? Which manuals are only on CD?
The quick reference guide and the assembly instructions are hard copy, the complete manual is electronic.

38. What is the rating of the usefulness of the Setup Instructions?
The assembly instructions are intelligently graphic designed making the user follow each step very clearly. There where no confusions or questions during the assembly process.

39. What is the rating of usefulness of the User's Manual and other associated materials?
At this stage in our evaluation there are several issues we are still unable to find in user`s manual, for example how to change the measurement units in the printer page set up dialog from centimeters to inches. Also the APS is not behaving well with a 23" HD Apple Cinema Display.

40. What kind of cut-away drawings or other drawings exist that show the various parts of the printer?
Actually the drawings of the printer are quite good, the assembly instructions are in black and white but use orange colors to attract the attention to important steps in the assembly process.

41. Is there a glossary in the User's Manual?
Yes, 29 basic terms are covered in two pages of the glossary.

The assembly instructions booklet is very clear in most of the procedures, but in some few cases the steps were not easy to understand.

42. What is the native language of these guides? Is the translation acceptable?
The user manual for Latin American comes with English, French, Portuguese and Spanish languages

43. Is there a Service Manual?
We did not find a service manual for the end-user.

INSTALLATION OF THE PRINTER: TRAINING

44. What training is included with the purchase?
No training whatsoever.

45. Is training included in the purchase price? If so, what kind of training is offered?
No training whatsoever for Guatemala.

46. Is training necessary? Is classroom training available?
If you are new to printing there will be probably be a high learning curve to understand monitor, printer and media color profiles. Just the Photoshop print dialog box requires a great deal of effort to understand every setting. For Guatemala HP distributors do not offer any training or tech support to help the end-user understand the printing procedures.

47. Is factory training available?
Contact reseller that provided the printer.

48. What on-line training is available?
Go to www.hp.com and visit the Designjet Printing Resource Center. "How to" training materials and videos are available for download.

49. What about follow-up training after you have had the printer a month and know enough to ask better questions?
Call the HP support center since the printer includes 1 year of technical support.

50. Following setup of the printer, , how soon is it realistic to achieve full productivity?
You can start printing the same day the printer is setup.

TECH SUPPORT & WARRANTY

51. What is the original warranty period?
One year.

52. What tech support is available and for how long? What is the wait time on the phone…truthfully?
HP offers warranty support in most countries during the 1-year warranty period or beyond if an extended warranty (Care Pack) is purchased. You should check with HP to determine the warranty and support coverage for your country. In the United States, typical wait time on the phone is immediate to 15 minutes depending on call volume.

CONSTRUCTION: BUILD QUALITY

53. Can you see how the print job is doing without opening the hood? Does opening the hood cause the printer to stop printing immediately?
There is a dark plastic window. If you open this window the printer stops immediately.

AESTHETICS

54. How would you describe the design of the printer?
Well designed, well constructed.

55. Can you easily distinguish which is the "front" and which is the "back'?
Yes there is no mistake.

You can easily distinguish the front from the back. Especially because of the location of the control panel (a).

STRUCTURE OF THE MEDIA PATH

56. Where do you load the media? Front, back, top, lower down?
The media is loaded from the back, roll or individual sheets.

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

**58. Is there a take-up reel? If not, how is media collected?**
There is a foldable basket

59. Is there a cutter? Is it manual or automatic.
The cutter is automatic but you can turn it off at any moment.

60. Can the on-board cutter cut all normal materials, or only thin materials? Can you cut canvas?
The cutter can cut all sorts of HP papers and other paper brands, but it cannot cut canvas or vinyl.
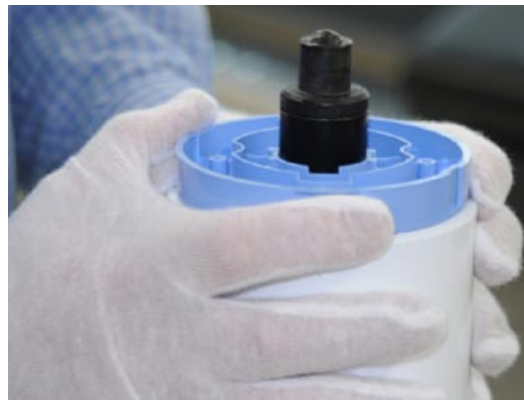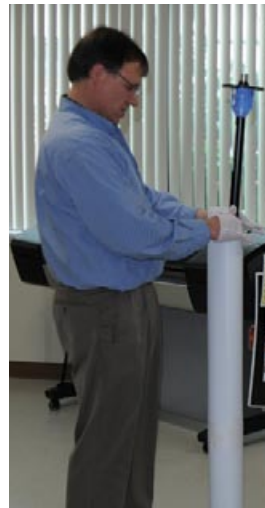
Media is loaded at the back. The instructions to properly load the roll of media were not very clear in the sense that the manual mentions lefts and rights, but it is hard to know if they mean viewed from the back or from the front. In these photos, Randy Ross, from Parrot Digigraphic loading a roll of media.

STRUCTURE: Miscellaneous

61. Does the printer have wheels? How many, and how strong? Are the wheels double or single per unit?
The printer stand has four wheels. One in each leg.

62. Do the wheels have locks? On all four wheels, or only front wheels?
There are locks on all four wheels.

63. In the main area for operation, is the machine software based (touch screen), or with physical control buttons? Or Both?
Both.

64. How many operators or operator assistants does this printer require?
No assistants, only one operator.

65. What is done on the printer's LCD as compared to what aspects of the printer control are done from the separate print server (where the printer RIP software is handled).
Most settings on the LCD can be controlled from your computer software.

66. What is the level of ease of use? Can anyone use this printer or do they have to be trained and certified?
Not trained or certified but you must know about printing, media profiles and basic color management, other wise you will have a high learning curve. You will probably be able to print perfectly without any color management.

67. What is the size of the LCD panel?
The LCD panel is small but very well illuminated.

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

69. What aspects of the printer can you operate from behind (the loading area)?
From behind there is access to main power supply, main power button, Ethernet card, and loading area.

70. What controls are on either end?
Power cord, main power button, Ethernet card and paper spindle is in the rear. LCD panel and Ink cartridges are in the front six cartridges on each side.

The LCD panel is modest in size and in terms of what you can do.

PRINTHEAD TECHNOLOGY

71. Is the brand and model of printhead clearly identified in the published specifications?
Yes.

72. What printhead technology does it use?
HP Thermal Inkjet.

PRINTHEAD DPI & FEATURES

73. How many nozzles per printhead?
2112 nozzles per print head.

74. How many printheads per color?
One printhead for two colors.

75. What is the drop size in picoliters?
4 pl (lc, lm, lg, pK, E, G), 6 pl (M, Y, mK, R, GN, B).

PRINTHEAD REPLACEMENT

76. What does each printhead cost to replace?
$70.00 per printhead.

77. Is the printhead user installable?
Yes.

PRINTHEAD POSITIONING

78. How many total number of printheads?
The printer came with 6 printheads – 2 colors per printhead.

79. Are printheads arranged in a cluster, or in an array?
In a cluster.

80. Are printheads at an angle, or in a row?
In a row.

81. Is there a sleep mode? Should the machine ever be turned completely off? Does not entail having a UPS unit to guarantee it is on all the time?
There are three types of sleep mode for the printer so it should be powered continuously since it uses very little electricity.

PRINTER DRIVERS & RIP SOFTWARE: WHAT SHIPS WITH THE PRINTER?

82. What software ships with the printer?
The Z3200 Photo Series (raster driver) includes the HP Raster Printer Driver, HP Printer Utility and HP Color Center. The Z3200ps Series includes the HP Printer Utility, HP Color Center, HP Advanced Profiling Solution, and a PostScript RIP.

PRINTER DRIVERS & RIP SOFTWARE: FEATURES

Each printhead handles two colors.

HP Start-Up Kit, in CD. You install the printer as a normal desktop printer; there is no need of a RIP software.

83. Does a RIP come with the printer at no extra cost?
Yes, the printer includes an onboard PostScript RIP. The onboard RIP is advantageous in that it frees up your workstation from having to process the image files for printing. The onboard RIP is responsible for processing the images, which allows for a more efficient workflow. The printer's LCD also allows for recently processed files to be recalled and reprinted without reprocessing the image.

84. Is your printer and/or RIP Pantone certified?
Yes

85. Can your printer function without a RIP with a Macintosh or only with a PC? In other words, are your drivers for PC only or for Mac and PC? Do you get full functionality with a Mac driver compared to a PC driver?
The printer can function without a RIP, in both platforms, Mac and Pc.

86. Is your printer equally Mac friendly?
Yes very Mac friendly.

COLOR MANAGEMENT FEATURES

87. What color management software is included?
HP Advanced profiling solution

88. What color management tools are included within the printer?
An internal spectrophotometer is included.

89. Is the color management system included in initial price, or is it an add-on optional expense?
With the ps models it is included on the original price. You can also buy it from HP at $349.00 if you do not have the "ps" version.

The spectrophotometer is one of the advantages of the "Hp Z3200ps" model over the "Hp Z3200" model.

There are six cartridge slots at each side of the printer., one of which is a gloss enhancer.

INK: COST

90. Does ink come in cartridges or bulk? How large are the ink containers for replacement ink?
130ml ink cartridges.

91. What is the cost per container? What is this cost translated to liters?
The cost for a single cartridge is $78.50, which is $942.00 to replace a set. You can save $16 per cartridge by purchasing "twin-packs." Each "twin-pack" contains two cartridges of the same color for $124.99 each ($62.50 per cartridge). A full set of twin-packs costs $1499.88, but saves $384.12 in ink costs.

	How many ml per cartridge	How much per cartridge	How much per liter
HP Z3200	130ml twin-pack	$124.99	$480.73
Canon iPF 8100	330ml	$173.00	$524.24
Epson Stylus Pro 9880	110ml	$69.95	$635.91
	220ml	$112	$509.09

92. Does the printer software provide usage and accounting information on each print job?
Actually the printer utility keeps track of the media usage and information on the prints made. Very useful.

This model prints up to 44", but there is a smaller version that prints up to 24". The photograph being printed was taken by Nicholas Hellmuth.

MEDIA: size

93. What is maximum width of the roll?
44 inches.

94. What thickness can this printer handle?
Up to 31.5 mil.

APPLICATIONS

95. What are the applications listed by the manufacturer?
Primary applications:
- Photos
- Digital fine art
- Graphics design
- Layouts and comps;
- Mockups;
- Proofs;
- Proofing.

Secondary applications:
- Presentations;
- Posters;
- Banners;
- Displays;
- POP/POS.

John Lorusso in the middle and Randy Ross at right, from Parrot Digigraphic with Dr. Nicholas Hellmuth from FLAAR Reports, holding prints made on the Hp Z3200ps model.

Ideal for: Creatives who want to produce accurate gallery-quality black-and-white and color prints easily, consistently, and cost-effectively.

From right to left: John Lorusso from Parrot Digigraphic, Dr. Nicholas Hellmuth and Eduardo Sacayón from FLAAR Reports holding fine art black and white prints made on fine art canvas on the Hp Z3200ps model at Parrot headquarters.

APPENDIX A: Fine Image Reproduction Workflow at Parrot Digigraphic.

Betterlight Super 8K-HS large format scanning back.

Cruse Scanner.

The Hp Z3200ps printers where put to the test at Parrot Digigraphic with a complete fine art giclee workflow using two of the finest known digital scanning systems, the Betterlight Super 8K-HS large format scanning back and the Cruse Scanner.

The 44 inch ps models are put to the test with HP Satin photo paper. Color gamut, tonal range and detail is evaluated on the prints.

Parrot Digigraphic and FLAAR Reports have a long range relationship testing and reviewing HP line of printers and other color management tools required to obtain professional results in Fine Art Giclee workflow.

APPENDIX B: Fine Art Photography being printed at FLAAR facilities.

Our in-house Hp Z3200 44inch photo printer model used for fine art black and white, nature and location photography.

Work-in-Progress

This evaluation will run for more than a year. Yes, this is because we are not a sham-review site. Sorry, we actually use the printers and digital cameras and scanners that we write about. Plus, we are typical end-users (again, not a commercial site creating pseudo reviews just to push one brand). FLAAR has used Epson and Canon, indeed we had four Epson Stylus Pro printers in recent years (and two Canon iPF printers).

The printer arrived only a few months ago, so we have a long way to go in evaluating this equipment. But I can comment that installation and set-up was a breeze.

And, the first prints (that we needed quickly so I could take them to Antigua Guatemala to help guide us in a complex panorama shoot of a 16th century Spanish colonial) came out perfectly. And this was before we even had time to learn all the options this printer offers.

HP has substantial resources to develop the level of technology built into this printer. I have been to the world headquarters of HP wide-format printers in Barcelona, Spain, five times in the last seven years, as well as about three times to the huge HP facilities north of San Diego, California. When you see their facilities and meet all the engineers and color management people who create their printers you can see why they are market leader.

Since I have not been to Canon Japan or Epson Japan, I can't comment on what facilities they offer, but I have been to printer manufacturers in Korea, Taiwan, throughout China, Canada, and all around Europe. In this aspect the FLAAR evaluations and reviews are unique, in that our staff literally travel around the world to learn about wide-format inkjet printers.

Over the coming weeks we will be updating this report with a succinct list or pros and cons.

If you would like an assessment of the differences among this HP and the Canon iPF and Epson Stylus Pro printers, try to find a dealer who sells all three brands (because if a dealer sells only one or two brands they will push the ones they have). I have visited one nation-wide dealer who has all three brands in his showroom, Parrot Digigraphic. What sets this place apart from others is that they are the only HP, Canon, and Epson dealer in the world that handles the complete professional workflow for fine art giclee (sorry, they are the only location where you can see both Betterlight and Cruse giclee scanners sitting side-by-side; you can't see this even in Europe).

Evaluation of Inkjet media

In our subsequent updates we will evaluate fine art giclee and photography media. This will begin with the HP media that we received, but as soon as these rolls are used up we will switch to other media that becomes available for evaluation.

Pros

I recently asked a giclee atelier color management specialist (Gary Kerr) about grayscale images (black and white fine art photographs would be the best example). He said the same that every other giclee person has indicated, that the HP Z3200 printer in particular provides absolutely the most neutral black. Gary Kerr is a long-time Epson user who switched to Canon (among other reasons, to overcome "greenish" black inks from the Epson printers he was using at that time). He rates Canon grayscale as better than Epson. He rates HP grayscale as #1 in terms of being neutral.

Cons

Gary Kerr, an experienced giclee workflow individual who owns and operates a leading giclee atelier, Fine Art Impressions, says that a front-loading printer can often be more effective for full-scale production usage than a printer that has to be loaded from the back.

Most recently updated January 2010.
First issued November 2009.

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).

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

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

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

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

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If you have received a translation, this translation is not authorized unless posted on a FLAAR web site, and may be in violation of copyright (plus if we have not approved the translation it may make claims that were not our intention).

Also, since this report is frequently updated, if you got your version from somewhere else, it may be an obsolete edition. FLAAR reports are being updated all year long, and our comment on that product may have been revised positively or negatively as we learned more about the product from end users.

If you receive any FLAAR Report from a sales rep, in addition to being violation of copyright, it is useful to know if there is a more recent version on the FLAAR web site, because every month new UV printers are being launched. So what was good technology one month, may be replaced by a much better printer elsewhere the next month.

To obtain a legitimate copy, which you know is the complete report with nothing erased or changed, and hence a report with all the original description of pros and cons, please obtain your original and full report straight from www.FLAAR.org.

Your only assurance that you have a complete and authentic evaluation which describes all aspects of the product under consideration, benefits as well as deficiencies, is to obtain these reports directly from FLAAR, via www.wide-format-printers.NET.

Citing and Crediting

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

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

The material in this report is not only copyright, it is also based on years of research. Therefore if you cite or quote a pertinent section, please provide a proper credit, which would be minimally "Nicholas

Hellmuth, year, www.FLAAR.org." If the quote is more than a few words then academic tradition would expect that a footnote or entry in your bibliography would reference the complete title. Publisher would be www.FLAAR.org.

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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 work-around. And not all glitches manifest themselves in all situations, so our evaluator may not have been sufficiently affected that he or she made an issue of any particular situation. Yet such a glitch that we don't emphasize may turn out to be adverse for your different or special application needs.

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

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

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

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

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

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

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

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

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

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

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

Results you see at trade shows may not be realistic

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

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

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

Trade show examples tend to be on the absolutely best media. When you attempt to save money and use economy media you will quickly notice that you do not get anywhere near the same results as you saw in the manufacturer's trade show booth, or pictured in their glossy advertisement. Five years ago we noticed Epson was 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 hardware and software. This is why Nicholas Hellmuth is considered the "Johnny Appleseed" of wide format inkjet printers.

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

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

Be aware that some RIPs can only accept ICC color profiles: you quickly find out the hard way that you can't tweak these profiles nor

generate new ones. So be sure to get a RIP which can handle all aspects of color management. Many RIPs come in different levels. You may buy one level and be disappointed that the RIP won't do everything. That's because those features you may be lacking are available only in the next level higher of that RIP, often at considerable extra cost. Same thing in the progression of Chevy through Pontiac to Cadillac, or the new Suburbans. A Chevy Suburban simply does not have all the bells and whistles of the Cadillac Escalade version of this SUV.

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

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

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

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

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

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

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

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

If you are not going to use your printer for two or three days, you have to put flush into the system and prepare it for hibernation (even if for only four or five days). Then you have to flush the ink system all over again.

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

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

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

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

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

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

Realize that a FLAAR Report on a printer is not by itself a recommendation of that printer. In your local temperature, in your local humidity, with the dust that is in your local air, with your local operator, and with disorientation of the insides of a printer during rough shipment and installation, we have no knowledge of what conditions you will face in your own printshop. We tend to inspect a printer first in the manufacturing plant demo room: no disjointed parts from any shipment since this printer has not been 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 book of sales in the third quarter of 2008 resulted in many tech support problems.

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

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

Any new printer, no matter who the manufacturer, or how good is the engineering 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.

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 Sun LLC, Caldera, EskoArtwork, Raster Printers (EFI Rastek), DEC LexJet, DigiFab, Barbieri electronic, Seiko II, Mutoh Europe, IP&I, Dilli, Yuhan-Kimberly, GCC, Grapo, Durst, and WP Digital for providing funds so that we can make more of our publications free to end-users. During 2000-2001 we had grants to cover all the costs of our publications, and all FLAAR Reports were free in those early years. As that early grant naturally expired after a few years, we had to begin charging for some of our reports to cover costs. Now (in 2009), we are seeking corporate sponsorship so we can gradually make another 20% of our publications free to our readers.

Since 2006 we do a major part of our evaluations at a factory and headquarters demo room. Since the university does not fund any of these trips, it is traditional for the manufacturer to fund a research sponsorship. In the US this is how most university projects are initiated for decades now, and it is increasing. In fact there is a university

in Austria that is not an "edu" but is a "GmbH", funded by the chamber of commerce of that part of Austria. In other words, a university as an educational institution, but functioning in the real world as an actual business. This is a sensible model, 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, EskoArtwork, Gerber, Grapo, IP&I, Mimaki USA, Mutoh, Dilli, 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. Bordeaux, InkWin and Sunflower ink have brought us to inspect their ink manufacturing facilities and demo rooms. We have visited the world headquarters and demo rooms of HP in Barcelona and received informative and helpful technology briefings roughly 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 Tech-

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

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

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

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

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

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

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

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

FLAAR Reports

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Introduction to UV Curable Inkjet Flatbed Printers
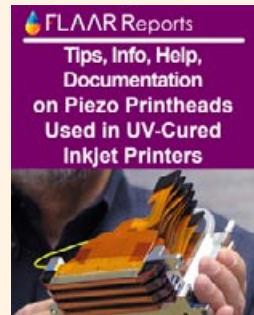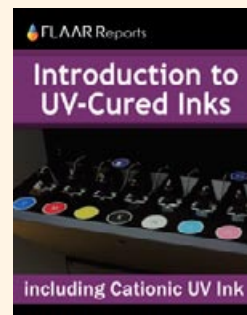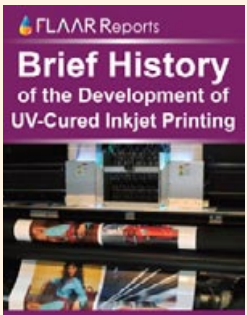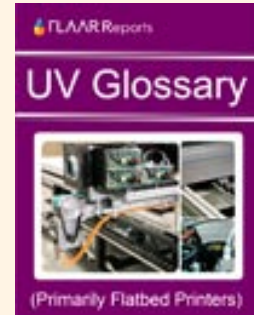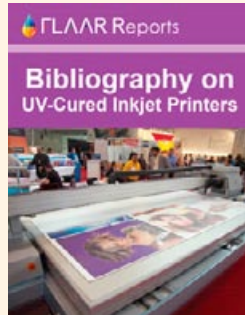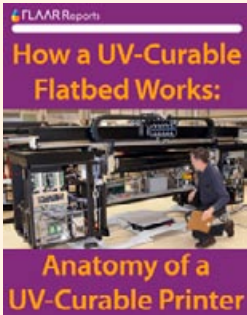
Most recent UV Printers

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

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UV Printers Trends 2008 SGIA '08 PART I

Flatbed & Roll-to-Roll UV Printers SGIA '08 Part II

TRENDS, Part II: Markets & Technologies UV-cured printers at ISA 2009

TRENDS, Part I: Analysis One by One of the UV-cured printers ISA '09

UV Market TRENDS Observable at FESPA Digital Europe 2009

TRENDS in 2009 Analysis One by One of the UV-cured printers at FESPA Digital Europe

TRENDS of UV-Cured Wide-Format Printers Shanghai '09

UV COMBO FLATBEDS Shanghai 2009

TRENDS IN HYBRID STRUCTURE UV PRINTERS Shanghai 2009

UV Roll-to-roll Observable at Shanghai 2009

UV Flatbed Printers at APPPEXPO, Shanghai '09

Trends in Wide-Format UV Printers Observable at SGIA '09

UV-Cured Inkjet Printers at VISCOM ITALY 2009

Learning more of UV-Curable TRENDS By visiting VISCOM Paris '09

UV Printers Manufactured in China, Korea and Taiwan

Chinese UV Inkjet Printers 2009 Comprehensive FLAAR Inventory

Chinese UV Inkjet Printers 2008 Comprehensive (Complete) FLAAR Inventory

UV Printers Manufactured in Korea 2009 Trends, Markets & Applications

UV Printers Manufactured in KOREA 2008

List of UV Printers Manufactured in Taiwan 2009