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Epson Stylus Pro 4800

FLAAR Site Visit Case Study

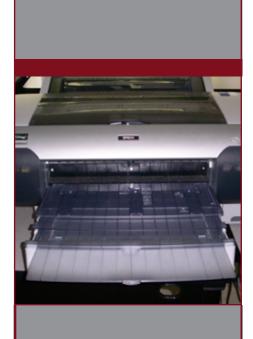
Standards for Evaluating Wide Format Inkjet Printers



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FLAAR Reports

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Editor's Introduction

The purpose of a site-visit case study is to learn and understand the experiences of a reliable individual on a specific inkjet printer. The College of Art at BGSU has an Epson Stylus Pro 4800. It essentially replaces an HP office printer, the HP Business Jet 2600. Most politely put, this particular model HP printer was purchased by mistake. There are plenty of HP printers that would have been more appropriate for an art department, most notably the HP 130.

So here is a perfect example of some sales rep selling the wrong printer for the wrong reason, and a purchasing agent buying an inappropriate printer for reasons that, in the long run, required that they buy another printer (in this case the Epson 4800) to provide the kind of printer that should have been bought in the first place.

Anyway, that is old history. At least someone had the bright idea to order an Epson 4800. That made a lot more sense than an office printer. It is not the HP brand per se that was wrong before, it is that a "business" printer is not made by HP to provide an art department what they need.

The Epson Stylus Pro 4800 printer was bought in October last year. At that time, other than the HP 130, there was not really much competition. Encad was fading from the scene and in any event had not made a desktop sized printer since the late 1990's (Croma Pro 24). No other brand (other than Epson and HP) has established itself as a serious potential choice in the desktop market for an art department. Note I did not say that no other printers exist; there is a big difference between "existing" and being valid for consideration. Epson and HP are the only printer manufacturers who have been successful in the giclee and fine art photography market, so far.

In the report the comments of the art department printer operator are the answers. When the Editor makes his injection into the discussion, he identifies this as "Editor:"

The photographs that were used as test prints were taken recently by Nicholas Hellmuth with a Canon EOS 5D digital 35mm SLR camera. The leaf was photographed in Coban, Guatemala. The doorway and other images are from the northern Aegean Island of Lemnos.



The Basics

Brand name, model EPSON stylus Pro 4800

Width of media accepted? 17"

Year purchased 2005

When was this model first introduced? October 2005

List price? What accessories are extra costs? \$1,995, the printer stand and network interface card are all optional accessories.

Editor: Here are the street prices on the Epson Stylus Pro 4800 Printer stand \$348, so, printer (\$1,995) + stand = \$2,343 Printer cover, \$99 Replacement cutter blade \$95 Replacement maintenance tank \$39

Profile of the End-User

What is profile of the printshop in which this printer is now installed?

The printer is actually in an art department lab within Bowling Green State University. The printer is being used to produce portfolio quality prints for student work.

What other printers do they have?

HP Business Jet 2600

What about this printer attracted you to purchase it?

Thought that the expected life of the printer was appropriate for the typical use. Additionally, the larger print size, gamut that is similar to CMYK, and consistency of prints were attractive qualities.

Machine Build and Mechanics

1. Can you look in and see the freshly printed area?

You must wait for it to come out of the hooded area.

2. What sensors does the printer have? Can the sensors detect clogged nozzles and provide backup nozzles? You must throw the damaged print away, clean the printheads, and start all over again from scratch.

3. What is the solid-ness of the construction of the outer body? Is it plastic? Metal? Heavy gauge? The construction is mostly plastic, but is very durable.

4. What are the specs for the supports? Are the supports included or optional accessories? Does the printer vibrate while printing?

The printer stand is an optional accessory. No vibration occurs during printing.





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Printheads

5. What is the printhead technology?

Piezo-electric, with one printhead per color.

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

Editor: most printer spec sheets do not identify the brand name of the printhead, or if they identify the brand, they don't identify the model or details of the printhead. This is as true of other brands as it is of Epson. Roland also does not identify what printheads are inside its printers..

7. What other printers use the identical printheads or a model very similar? EPSON Stylus Pro models 4800 7800 9800

8. How many printheads does this printer use in total?

This printer has a single printhead.

9. How many printheads are there per color?

Instead of printheads per color, it is colors per printhead with this entry level model.

10. Are any of the printheads shared?

Yes, there is only one printhead and it is shared.

11. How many total nozzles does this printhead have? How many are redundant, so can replace nozzles that fail?

180 per color, so 8x180=1440 nozzles.

Editor: There are no redundant nozzles on any Epson piezo printheads, nor is there yet any software manner to have one Epson nozzle replace one that is clogged or otherwise failed. Among piezo printheads, ColorSpan is one of the few companies that has software on board to replace nozzles on the fly by a "buddy nozzle." ColorSpan uses Ricoh-Hitachi printheads on both their UV and solvent ink printers.

12. How many nozzles per printhead? How many printheads per color?

1440 nozzles on one printhead, so 180 per color

Specifications: Printhead; Testable aspects

13. How long can this printer sit unused without the heads clogging?

Heads are cleaned every 2 weeks when busy. (Cleaning was necessary for our test prints; the printer had not been used 4 weeks prior to the test.)

Editor: the printer itself has auto-sensing capability so will decide when to clean on its own, but in addition to this, you can also instruct the printer to clean.

14. When you bought this printer, what speed did you presume you would get?

Speed was not a consideration, however a typical inkjet speed was assumed.

15. Now that you have the printer, do you feel the speed is what you were led to believe? Currently feel that the speed of the printer is appropriate and meets the demands of users.



16. Taking the various speeds that this printer advertises, rate the quality or defects of the output of the fastest speed?

Quality is too low at the fastest speed for portfolio pieces and student assignments. This printer is usually operated at the highest quality setting to ensure the quality of prints.

17. For top photo quality mode, is this printer faster or slower than competing printers? How long does it take to print an image 42 or 44 inches wide by six feet long, at the absolute highest dpi and top photo quality setting?

I would consider the printer to be on average with competing models.

Specifications: Set-up of the Printer; Tech Support

18. What is setup of the printer like? How many people are required for setup? Does the purchase price include sending a manufacture representative to set it up?

2 people were required to remove the printer from its box. Other than physically moving the printer, installation can be completed by a single person.

19. What is the rating of the usefulness of the Setup Instructions?

The instructions were clear and there was no need to seek outside assistance or support at the time of installation.

20. What is the rating of usefulness of the User's Manual?

The manual is very useful and gives clear instructions.

21. Is there an extended hardware warranty? Who provides service? Dealer or manufacturer? No, we do not have an extended warranty.

Editor: if you wish an extended warranty you can buy one from the dealer.

22. Who does repairs? Do spare parts come from a foreign country? If so, what is the wait time? Unknown at this time, because no repairs have been done on the printer to this date.

Editor: Decision One is the national service arm of Epson.

23. Rate ease of use? For example, would this printer survive in an in-house corporate work group with no technician on-duty?

Use is very straightforward, currently the typical operator is an art student who has attended a one-hour session of how to use the printer given by the program director.

24. What cleaning is needed at end of the day? None

25. What preparation is needed at beginning of the day?

None

26. What maintenance is required during the day if you run it hard all day? None



27. How much wastage do cleaning, calibration, and maintenance generate? We mean wasted media, wasted ink, time lost?

This is unknown because the department does not document the wastage at this time. It is worth noting that a noticeable amount of ink is used when cleaning is done.

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Capabilities of the printer driver?

28. What features does the driver offer? How do the features and capabilities of the printer driver compare with device drivers of competing printers?

Currently this printer is being run solely from the drivers. The drivers offer features such as automated cleaning and compatibility with both Mac and Windows based operating systems. Compared to drivers of other printer manufacturers, results have been better than typical with little to no issues.



Editor: Epson has the most capable printer drivers of any printer brand that we are aware of. Some other printer brands assume the owner will already have or will need to buy a RIP software (which costs between \$2,500 and \$3,500). Other printer brands have drivers that allow the printer to be used without a RIP but the functions of the printer driver are so minimal that most frustrated owners quickly realize that the cost of a RIP is a painful necessity. With Epson you do not need a RIP software package if you are not applying custom CMYK ICC profiles. So if you are printing as a hobby, as a second business, or as a start up, you can do okay with no RIP software expense. You can do RGB custom ICC Profiles without a RIP.

But, if you are doing fine art photography or giclee commercially, as a serious business, you will need RIP software for a dozen different reasons. We discuss all aspects of RIP software, why you need it for commercial production, in the FLAAR Series on RIPs, www.wide-format-printers.NET.

RIP Software

29. Does the price of this printer include a RIP? If a RIP is included or part of a package, is it a lite RIP or a full-featured RIP? Can this RIP be updated or run any other printer?

The Colorburst RIP can be purchased along with the printer in the professional package, however it is not included in the base package that this report was conducted on.

Editor: Epson and HP offer printers with, or without, a RIP. The RIP software provided by Epson, and by HP, are from different companies, but are both "lite" RIPs. A lite RIP is okay to start with, but sooner or later you will need, or want, a full-fledged RIP. We explain the difference between a lite-RIP and a real full RIP in the FLAAR Reports, and offer suggestions of which RIP software brands are among the best.

30. Can this printer realistically function with no RIP whatsoever? If so, what features are missing or slowed down when no RIP is used?

This printer functions well without a RIP, its addition would allow better postscript and color manangement handling.

31. Can this printer function without a RIP with a Macintosh or only with a PC? In other words, are the drivers for PC only or for Mac and PC? Do you get full functionality with a Mac driver compared to a PC driver?

Drivers are fully supported for both platforms. Currently the printer is being run from a Mac station with no problems handling files created in either operating system.

32. If the end-user is a Mac-only facility, is the printer Mac friendly?

Yes, the printer has full driver support for the Mac platform.

33. Is this printer Pantone certified?

No. If you need Pantone certification you need to buy the Pro Edition.



Color Management

34. What color management tools and software are available in the printing location? Only the standard profiles that accompanied the printer.

Editor: using standard canned profiles is the hook; to handle customized ICC color profiles you need a full-scale RIP software package. The same would be true with any other brand of printer. This issue is inherent in the nature of color management, and which companies own the patents for color management software that handles ICC color profiles.

When you buy any printer, you need to recognize the need to interact (after the initial purchase) with an intelligent resource that can assist on matters such as color management and ICC color profiles. That is why we obtain our Epson and Canon printers from Parrot Digigraphic. Their tech support people can provide assistance with color management. You can't get this class of assistance from a low-bid place that just sells printer boxes (the proverbial "box pusher").

Ink

35. Is the ink unique to the printer?

The EPSON 4800, 7800 and 9800 all use the UltraChrome K3 Ink technology. This is not to be confused with UltraChome inks that were used in previous printers such as the EPSON 7600 and 4000.

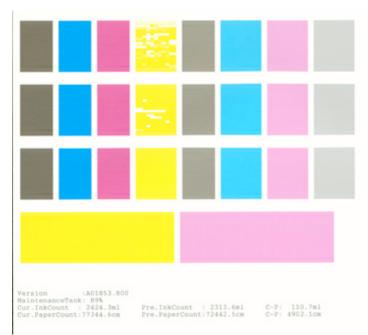
36. Does the printer allow switching from dye to pigmented ink?

No, only pigment-based inks can be used.

37. List and quantify what colors the inks cannot achieve?

Colors are limited compared to a dye-based printer.

Editor: it is usual for all brands that pigmented ink has a smaller gamut than dye-based ink. But to see the full gamut of your ink you need a color managed workflow. Plus you need to be realistic about what colors an inkjet printer, of any brand



38. Describe presence or absence of problems with metamerism with the printer?

No known examples of metamerism have been documented at this time.

39. Is there any ink color or kind, which gives a problem that you don't get with the other color inks? No, however gloss black is preferred over matte black for the kind of work that our students do.

Editor: gloss black is for glossy photos; matte black is for watercolor paper for a matte (non-glossy) appearance.

40. Which color of ink is used up the quickest? Cyan, but all colors tend to deplete at a similar rate.





41. How large are the ink containers?

Cartridges are 110 ml. But if you don't mind the cartridges sticking out you can order the 220 ml size.

42. What is the price of ink, per color, per liter?

\$69.95 for 110 ml. cartridges per color. 220 ml are \$112.

43. Does the printer have a dryer?

Prints air dry.

44. What claims does the manufacturer publish for longevity?

Color: Up to 108 years, Black and White: Over 200 years.



A print showing the result of a clogged yellow printhead.

Editor: a savvy buyer, and an experienced user, will realize that all longevity claims are completely mythical. Ozone and other issues may well cause the deterioration long before sunlight wreaks its havoc with the color. The truism remains: bluntly: all color fades. This is as true with other brands as it is with Epson's inks. Indeed, in the past Epson has stated clearly that it will not back up its longevity claims whatsoever.

45. Does this printer experience banding and if so, what are the varied causes of such horizontal banding? Do clients notice the banding? What percent of clients care about banding?

Operators or clients have not noticed banding.

- 46. How often might the printheads lose a color? This means, in a long print run or a long banner, what are the chances that one color may become clogged and stop printing as is well documented for piezo printers? Just over 2 weeks, cleaning is done bi-weekly to prevent this.
- 47. What is the process the printer uses to clean its printheads? Does the printer do this automatically? Or does the operator have to do this by hand? How much ink does cleaning the heads waste? Is there a light cleaning, and a heavy cleaning option?

The printer has an automated cleaning procedure that is included in the driver package. Both light and heavy cleaning options are available.

48. How much ink is used up during installation of the printer? If a piezo printer, does that mean I have to buy practically a complete set of ink within a few days of paying off the cost of my printer? Does that mean ink will end up costing more than my printer?

Initial supply of ink lasted about two months, of typical use.

49. Color stability: how many hours does it take the color to stabilize?

Color stabilizes around 24 hours after the print is made.

Editor: Ink load and other factors may determine when the color stablizes.

50. Color consistency from one print job to another: If you print the same job 1 week later, 1 month later, will the color on the same media be the same?

Color is very consistent and lasts almost indefinitely as long as there are no changes in the ink. Printed pieces have been reproduced over 6 months later with little to no noticed shift in color.

51. How much hands-on work is required to set up the ink system? Is hand priming or sucking the ink down the tubes required of the operator? Is head priming automatic, or operator initiated?

Hands-on work is very minimal with all setup and preparation being automatically done by the printer.



- 52. Is there an out-of-ink alarm? Is there a warning before actually being out of ink? What if the operator is out of the room? Does the printer stop?
 The printer gives a notice that it is running low on ink, and will stop when completely depleted.
- 53. When the printer runs out of ink in the middle of a poster, and you replace the ink and continue printing, is that poster ruined or can the printer start back up flawlessly without leaving a mark or an area with no ink?

The printer can be resumed once it has stopped printing. More than likely the print will have to be discarded because of a noticeable line or other irregularity in the print when this is done.

Editor: in fact you may be able to resume printing without any defect in the print.



54. What surprises might I encounter if I try to let the printer run unattended overnight? Why might it not be a good idea to let the printer run unattended overnight? Can the printer detect when one ink chamber is empty? Or will the printer continue to print indefinitely overnight even if one color is empty?

Most likely the printer would load the paper incorrectly and stop report a paper jam, stopping the printing process.

55. Hopefully the printer manufacturers own in-house technicians can achieve needed color gamut and can match our needed corporate logo colors. But can an average user achieve fire engine red, Coca Cola or sunset red, the cyan needed for a blue sky? Green of Irish grass pastures, the yellow of Ford pickup trucks? We realize that gold may be tough for any printer, but red, cyan/blue, yellow and green are essential.

The typical user should be able to match a color as long as it is within the gamut of the ink and media combination. The typical user rarely does test prints, and adequate results are achieved the majority of the time.

Editor: The gamut you can achieve is a result of the ink and the media, as well as the settings in your software.

56. Can the printhead technology achieve a solid black black?

Yes, however this is more of a 95% gray. This level is true for both the matte black and photo black inks.

57. How about a large black fill area? Can this printer achieve an acceptable black without banding tracks? What about puddling?

There have been no issues noticed in typical use with banding or tracks.

58. Can the printer achieve a neutral grayscale? To what degree do grayscale prints turn out slightly magenta or greenish? Would the grayscale produced by this printer be acceptable to a photographer or artist who specialized in black-and-white work?

The image will have a slight green tint, however the output is considered better than comparable printers.

Editor: Grayscale is better than it used to be, but, if you go onto the User Groups and read their comments, and if you ask end users, they report that achieving a totally neutral grayscale is still a challenge. Even avid Epson fans comment on the lack of a neutral grayscale. And if you are going to come close you need a color managed workflow. But still (from what I have read) there is still a way for the software and inks to go before a completely neutral black-and-white print can be achieved. That said, this model 4800 (7800, 9800) is an improvement over earlier models.

59. Will quad-tone inksets be available for black-and-white printing?

They are not available at this time.



Editor: Jon Cone is one of the few companies still making quad-tone black ink-sets now that Epson has a light black. If you have a really good RIP software, and can linearize properly, and if you use good color management, all the extra black gradations (of ink) are not as necessary today as they were in past years with earlier printers.

60. Since Encad and ColorSpan have both demonstrated that textile inks can indeed work in thermal printheads, will reactive dye or other textile inks be available for your printer?

At this time they are not available from Epson.

61. Do you need to have a band of printable colors along the edge, outside the main printed area, to keep all printheads and their colored inks fresh and ready to print (so as not to dry out when not be used by the colors in the design)?

No

62. What other problems have people reported with the inks?

The majority of complaints received here in the College of Art at the university, would be that the printer is incapable of reaching the level of saturation the designer has intended.

Editor: if artists need really highly saturated colors they need to consider Symphonic Inks with Evolution RIP software. This combination of ink and software is made specifically to achieve high saturation for giclee and fine art photography. Otherwise you need to have a color managed workflow and understand how to handle ink limits in the RIP software. Of course this implies having a full-featured RIP.

Media

- **63.** Is printhead height adjustment available? Yes
- 64. Is there manual feed capability of sheets (sheet feed)?

Yes

65. What about printing on backlit? Is the printer as good as, better than, or not quite up to par with, other major printers?

Yes, but better results can be found using a printer with dye-based inks.

Editor: piezo printheads in general, and Epson printheads especially, do not give enough saturation for accomplishing a professional appearance on backlit material if you compare them with the output of printers that use thermal printheads. However backlit with Epson piezo printheads today is improved over what it was on the last generation of Epson printheads. For backlit a thermal printhead technology works best: Encad, HP, ColorSpan being known among sign shops for their good output for backlit. We just visited a large sign shop in Minneapolis. They had three printers with Epson printheads (an Epson and two Mimaki printers). They had to keep an Encad NovaJet printer just to do backlits.





66. What media will not work well with the printer? How many different kinds of media can be used, successfully? What media will not work at all with the printer?

Non-inkjet transparencies, and some thicker medias.

Editor: nowadays each printer is designed only for certain kinds of media. This is determined in part by the ink and also by the feeding system. A pigmented ink works well on some media; a dye ink may be better on different media. And so on. No one printer accepts all media equally well.

67. What about aftermarket media (brands other than the printer name brand)? HP, Encad, ColorSpan, and Canon can use about any and all media available. Some printers can print on newsprint for proofing) and Kraft paper for artistic effect. What about this printer? Ignore the claim "it prints on wide range of media." That is just a smokescreen. The real question is, "Can Printer X print on as many media as can Printer Y?" Printer Y is the one, which can actually truthfully print on almost everything.

Print quality on aftermarket media is usually of an acceptable level as long as the media is appropriate for Epson pigmented ink.

68. How much paper is wasted doing other print checks?

One 8½ x 11 sheet of paper is used during nozzle checks and head cleaning.

69. Does this printer have a special guidance system for handling edge-curl?

Not that is immediately noticeable to the end-user.

Editor: Roland has a hold-down plate for keeping the edge of the media from curling up. A curled edge causes a head strike which can damage the fragile nozzle plate and cause printhead failure. Most printers lack a hold-down plate for keeping the edge of the media from curling. Head strikes will scrape the nozzle plate and eventually cause a head failure (which necessitates paying for a new printhead, since a head strike is considered user error and is not covered by any warranty. A new printhead costs as much as \$1000, or more, since you have to pay the service technician to come and install it. Artist's canvas will curl at the edges, especially in winter, when the humidity is low due to using central heating.

We have to keep our giclee printer in a special humidified room (with a humidifier) to print on canvas.

Epson uses leading and trailing head rollers to attempt to keep edge curl down, and uses a vacuum in the center (which will not affect the edges as much). Experience will tell whether edge curl is an issue.

70. Is the media front-loading or rear-loading? This can impact the amount of space required around a printer. The printer is both front-loading and rear-loading.

71. Some printers advertise "two rolls of media" but in fact it is only one roll that can actually be feed. The other bar is merely a storage device. Yet a few printers can switch media from one roll to another with the

touch of a button. What does this printer offer? This printer can only handle one roll.

72. Does this printer accept hand-fed media? Is hand-feeding awkward or facilitated by the design?

Hand feeding is accepted by the printer and is not considered awkward in any way.

73. Is paper skewing a problem?

Not typically, unless loaded incorrectly.

74. What are preferred applications to print with this machine?

Acrobat Pro, and Adobe Creative Suite 2.



75. What applications are possible but mediocre? All applications that support the printer driver.

76. What applications would be better printed on another type of ink, media, or machine? Overheads would be better if printed on a dye-based printer.

Image Quality Factors

77. What about type (letters), especially small letters? Can this printer do a nice job: good sharp crispalphanumerics and line designs? Do you get fuzzy edges even with dye ink, or crisp edges? How does large sized text look, especially the edges? Is there splatter (ink droplets outside the main outline of the letters)? Is there a difference between serif and sans serif text quality?
The printer can handle type as small as 4pt. Fuzziness can occur in .eps files with small point size lines, possibly

because of the lack of RIP software. Large sized text looks great and does not suffer from splattered edges.



Editor: we noticed the same with an Epson 7600: small fonts were fuzzy when compared with an HP 30, 90, or 130 (which were very crisp as low as 4 pts). Piezo printers are good at many things, but not ideal for small text or fine detail in line drawings. This is why CAD and GIS reprographic print shops tend to use printers with thermal printheads.

File configuration or inappropriate media can also result in fuzzy text. But if you have to use expensive media just to guarantee acceptable text, this negates a printer for CAD, since CAD drawings are usually done on economical papers.

In Europe Epson sells a version of the 4800, with a different model number, 4400, that is intended for CAD. I would wager that if you compared the output with a thermal printhead machine, the small font text on the piezo would be fuzzy and not as crisp or sharp. However this does not detract from using the Epson 4800 for printing on canvas or watercolor paper, since the rough surface of these materials hide any imperfections.

We like Epson printers for photographs and paintings, but if we had to print lots of text we would use a thermal printhead and an HP, since they are made for CAD from their heritage as pen plotters. But for fine art photography, this is where (today), an Epson can produce an attractive print.

Assesment of Advertising Claims

78. Would you recommend that other people buy this printer?

Yes, because it is very reliable and has held up after being used exclusively by the design department for over a semester.

79. What do you wish the printer manufacturer would do to improve this product?

This printer could be improved by offering darker blacks, and a more vibrant gamut.



Conclusions

This is a real life site-visit case study of a typical mid-range user. Where the situation would differ totally is if you tried to use this printer 14 hours a day every day. Yes, it is also usable in two shifts a day, but the evaluation would be different, because constant use all day every day would raise other issues. But a printer at this size would not tend to be used in a production house; they would tend to prefer an Epson 7800 or Epson 9800.

By the end of this year there will be new printers that change all our current conceptions, but if you need a printer today, and can't wait, then you should take a look at the Epson 4800, 7800, and 9800. There are probably a hundred different places you can buy an Epson printer from, but only a few companies actually understand giclee and fine art photography. The one we know best is Parrot Digigraphic, www.ParrotColor.com, toll free 877 727-7682. They can also assist you with digitization of oil paintings and watercolor paintings, or preparing any other kind of artwork to reproduce as giclee prints.



To obtain more information, you can obtain basic FLAAR Reports from FLAAR at BGSU (by filling out the Inquiry/Survey Form).



Or you can obtain a veritable course in giclee production from www.wide-format-printers.NET, in the link to giclee or photo printers.

