

Epson 7800 Evaluation for Giclee & Fine Art Photography In-House Review based on two Years Experience with this Printer



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CONTENT



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THE BASICS

1. Brand name, model?

Epson Stylus Pro 7800



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

Epson designs the print heads, the software, and the print engine. The printer itself is then manufactured through Mutoh. Mutoh has the factories that manufacture many other brands such as for Agfa. Mutoh also reportedly makes the Seiko printers (this is widely stated but not fully confirmed). Ironically, Mutoh also sells a Korean UV printer that it does not manufacture nor design.

3. What other printers are the same or similar chassis?

The Epson 9800 is a wider version. The Epson 4800 is a smaller version with slight differences due to its smaller size.

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

The Epson 7800 is a mature printer based on many years of trial-and-error of earlier models. Each new model gets things accomplished better than the previous model. Epson engines and inks have come a long way since the models 7000 and 9000.

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

It is the replacement for the Epson Stylus Pro 7600. It prints quicker than the 7600 and has an improved ink set. One negative aspect of this printer is that it cannot reproduce images using both Matte and Photo black on command like the previous 7600 model. In order to change from one to the other, the current black in the system must be flushed out in order to interchange the new black in its place.

6. Is there enough new on this printer to make it worthwhile buying it if I already have another recent model?

The Epson Stylus Pro 7800 prints faster, more neutral, and is just as easy to use as the Epson Stylus Pro 7600. This printer will save time and money in the long run. It prints almost twice as fast with a better archival ink system: Ultrachrome K3 Inks.

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

A printer-only version is available for \$2,995. This does not include the stand and one set of ink (no ink set includes the matte black; it is purchased separately)

The Pro version is \$3,995 and includes the stand, ink, a life RIP, and a 100 base T Internet card, as well as:

- 1 additional set of 220 ml ink cartridges
- 3 rolls of 24' paper of choice
- 1 hour of telephone support for installation



8. What accessories are available at extra charge? Are these same or similar accessories included with other printers at no extra cost? What other costs are involved?

- EpsonNet Internal 10/100 BaseTX
- Paper roller spindle (Normal Tension)
- Paper roller spindle (High Tension)
- Manual Media Cutting System
- Replacement Manual Cutting Blade
- Replacement Ink Maintenance Tank
- Replacement Printer Cutter Blade
- Ink Cartridges
- 1 Year extended warranty
- 2 Year extended warranty

Parrot Digigraphic includes 30 days of applications support.

9. 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?

The bundle includes a full set of inks; if the printer is purchased by itself, no ink is included.

10. 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)?

No other equipment is necessary for the operation of this printer. A UPS is not necessary, but would be a good asset if power were to go out often in the location the Epson 7800 is run.

SET-UP OF THE PRINTER: PRACTICAL CONSIDERATIONS**11. What are the electrical requirements of this printer?**

There is no need to rewire your building. A standard three-prong plug is included.

12. Are there any special temperature or humidity requirements or preferences of this printing system?

- Storage (uninstalled), -22 to 104 F (-30 to 40 C); 1 month at 104 F (40 C)
- Storage (installed), -4 to 104 F (-20 to 40 C); 1 month at 104 F (40 C)
- Operation, 50 to 95 F (10 to 35 C)
- Print Quality Guarantee, 59-77 F (15 to 25 C)
- Humidity, 20 to 80 % RH (20 to 85% RH in storage) 40 to 60% RH for optimum print quality

For optimal operation, humidity should be between 35 and 45% RH.

13. What is the connectivity? Network, SCSI, FireWire, or other?

- USB (1.1 and 2.0 compatible)
- IEEE-1394 FireWire.
- A network card is optional for an extra charge.

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

- 22.4 inches (560 mm) high
- 47.12 inches (1178 mm) wide
- 131 lb (59 kg) printer
- 23.1 lb (10.5 kg) stand



Even though the printer has wheels it doesn't wobble when it is operating.



15. Does the printer come in one piece? Does this mean you have to remove a wall to get the printer this size into your office?

The printer arrives in one piece. The printer stand will come disassembled.

16. What is setup of the printer like? Can it be done with only one person? Does the cost include sending a person to set it up for me?

Setup was not difficult. Anyone with common printer knowledge could setup the printer. It takes at least two people to lift the printer onto the stand or other surface. The cost does not include a technician setting the printer up for you.



INSTALLATION OF THE PRINTER

17. How many people does it take to lift the box?

It will take at least two people to lift the box containing the printer.

18. How many people does it take to lift the printer out of the box?

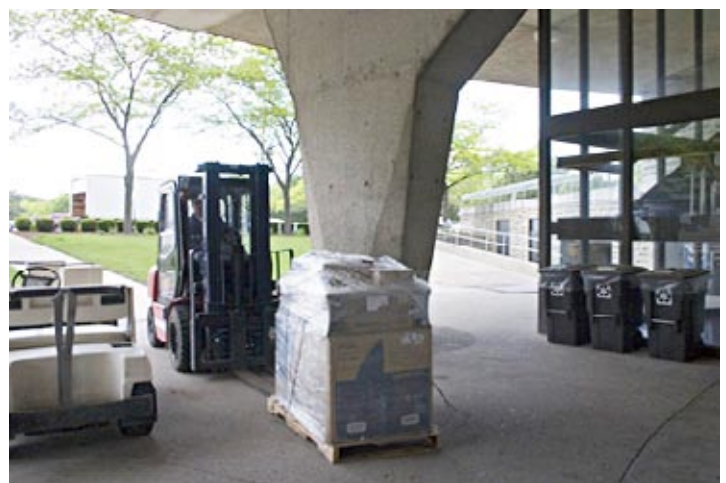
It would be safe to have at least two people handle the printer upon removal from the box.

19. Between the day the printer arrives, how soon is it realistic to achieve full productivity?

The Epson Stylus Pro 7800 can achieve full productivity as soon as it is setup and drivers and any RIPs are installed on a PC or MAC computer. Since the inks that are sent with the initial purchase of the printer are basically meant to fill the tubes, an additional set of inks may need to be purchased in order to keep fully productive.

20. How much of a learning curve is there?

For anyone who has worked with other Epson Stylus Pro printers prior to the Epson Stylus Pro 7800, the learning curve is very simple. The printer also adds the new Ultrachrome K3 archival inkset, which makes color management easier.









INSTALLATION OF THE PRINTER: INSTRUCTIONS & MANUALS

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

The setup directions would achieve a 10 out of 10. The directions did a great job of explaining to you exactly what needed to be done to setup the printer.

22. What is the rating of usefulness of the User's Manual and other associated materials?

The User Manual and other associated materials would achieve an 8 out of 10. This manual was certainly helpful, but not as much as most user manuals. The directions on how to install the drivers were not well written. Links displayed in the manual would direct you to the Epson website for information on drivers rather than having a link to the drivers website on the disc.

23. What schematics does the printer literature provide?

The Epson Stylus Pro 7800 manual very clearly indicates each step in constructing the stand for the printer as well as mounting the printer onto the stand and attaching the basket. The literature also provides clearly marked illustrations of each of the pieces required for the construction of the stand. It also shows illustrations of the software installation so that it is much less confusing to navigate the menus during installation.

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

The native language of the printer guides to the Epson Stylus Pro 7800 is in English. The instructions are easy to follow and were very intelligently created.



INSTALLATION OF THE PRINTER: TRAINING

25. What training is included with the purchase?

You do not really get any training included with the purchase of any consumer entry-level inkjet printer.

TECH SUPPORT & WARRANTY

26. What is the original warranty period?

The original warranty period is a 1-Year warranty.

27. Does it include parts, labor, and print heads?

The warranty covers 1-Year of on-site repair.

28. What sort of technical assistance do you actually offer? We mean serious technical assistance. Do your tech support people who answer the phone read from a script and only get a real technician later on? Most manufacturers are cutting back on tech support and/or have people answering the phones who do not themselves actually use or know the equipment first-hand. They just attempt to read from a script.

When you call Epson Tech Support, you talk to a customer service representative who can answer all questions you have regarding the printer.

One hour of telephone support for installation is included. Tech support is also available for one year. Evidently it is not clearly expressed. Parrot Digigraphic also provides one month of applications support.

On-site service plus parts-and-labor are included for the first year.

29. What tech support is available and for how long? What is the wait time on the phone...truthfully?

Tech support is available during a normal workweek schedule. They are very helpful and the wait time on the phone was moderate. We asked the people at Epson technical support about the Epson installation CD, as well as the problems we were having with installation. They told me where I could find the most up-to-date drivers.

30. Can you provide an extended hardware warranty? Who provides the service? The Dealer or the manufacturer?

Epson themselves provides the first 1-Year warranty included with the purchase price of a new printer. A second year extended warranty is available for an extra fee. The manufacturer provides the service through a service arm, "Decision One".

31. Who does the repairs?

Epson is responsible for the repairs. Parrot Digigraphic offers 30 days of technical support over the phone.

32. What about the dot pattern of your printer? Is this dot pattern as fine as that of an Epson 10000?

The dot pattern on the Epson 7800 is not even visible on a finished print. In comparison to the HP 5000, we could see the stochastic screening on every print when we looked for it.

CONSTRUCTION: AESTHETICS**33. Is the width enough for target applications?**

Default roll paper margins are 0.59 inches (15mm) along the top and bottom edge and 0.12 (3mm) along the right and left edges. Using the Menu system, you can set all the margins to 15mm or 3mm. Epson was the first printer to allow full-bleed printing (borderless printing).

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

The printer has auto-scanning sensors that detect clogged nozzles. You would need to clean the print heads and reprint.

35. What about heater or dryer?

No.

36. Can you easily tell which is the “front” and which is the “back”?

It is very easy to realize the difference between the front and back of this printer.

CONSTRUCTION: BUILD QUALITY**37. What is the solid-ness of the construction of the outer body? Is it plastic? Metal? Heavy gauge?**

A mix of plastic and metal materials.

38. The hood, is it strong, or cheap plastic?

The hood is sturdy enough to serve the purpose of keeping the roll media clean and dust out of the system.

39. What is the solid-ness of the inner parts? Plastic, metal?

The inner parts, including the tubing and construct of the carriage, are very sturdy. Even while the machine is running, everything runs smoothly and does not have any pieces that are loose. The cutting mechanism is also very sturdy as it cuts. There is no rattling or indication that the cutter is loose.

40. Does the printer wobble back and forth when printing?

With a fully assembled stand, the printer does not wobble back and forth while printing. If you are touching the printer, you can feel the pull, but it is not visible.

41. What are the specifications for the supports?

The printer does come with a stand. The stand is easy to assemble.

42. After you have used the printer for a while, do parts quickly wear out, break off, wobble, or malfunction?

The Epson Stylus Pro 7800 has been in use for one year at our facilities and no parts have worn out, come loose, or given us problems.

OPERATING THE PRINTER

43. Can you manage print jobs via the Internet with your printer?

No.

44. Can the operator manage print jobs via the Internet with this printer?

If the EpsonNet Internal 10/100 BaseTX Ethernet Type B Print Server Interface Card is purchased.

45. Which materials are pre-established in the software, or do you have to create the settings for each class of material yourself?

ColorBurst has pre-built "Environments" for download on their website including profiles and ink limits based on certain Epson medias. These can be used, or if a more accurate configuration is desired, it will always be necessary to create a unique profile for your specific printer and select the ink limit for each media.

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

The LCD panel on the Epson 7800 is controlled with buttons.

47. How many operators or operator assistants does this printer require?

Only one operator is necessary when using the printer.

48. What can you control as operator?

Operating the Epson 7800's LCD interface, the user can control functions such as nozzle checks, maintenance features such as cutter replacement and maintenance replacement, cutter adjustments, platen gap, roll paper margin, power cleaning, contrast adjustment, etc.

49. What is the level of ease of use? Can anyone use this printer or do they have to be trained and certified?

The printer can be used by anyone with a good knowledge of printers, networking, and MAC/PC software. The Epson 7800 manual will explain how to get the printer to print, but the operator will need to know the software RIP being used, or if no external RIP is used, will need to know how to print from the software the printer will be printing.

50. Can you do unattended printing? For how long? How about overnight?

Yes. The printer has run as long as 9 full hours attended (we made no changes to the non-stop printing once it had been initiated. We simply made sure problems did not occur). At our facilities overnight, we performed similar printing (we ran 12 prints overnight, each was 24"x36" at full bleed with settings set at printing 2880 dpi) in order to make sure time would persist on larger print jobs at a print facility.

51. Where does the operator stand or sit?

The operator can sit at the computer the printer is operated from.

52. What aspects of the printer can you operate from behind (the loading area)?

The Epson Stylus Pro 7800 is fully operational from the front, including loading the paper, accessing the printer menu and maintenance, and removing the prints from the basket.

PRINTHEAD TECHNOLOGY

53. Is the brand and model of print head clearly identified in the published specifications?

No.

54. What other printers use the identical print heads or a model very similar?

The Epson Stylus Pro 4800 and Epson Stylus Pro 9800.

55. What is the width of the printing pass of this print heads?

The maximum print width is 24" including a full bleed.

PRINTHEAD DPI & FEATURES

56. How many nozzles per print head?

There are 180 nozzles per each of the 8 colors.

57. How many print heads per color?

Only one print head exists for each color

58. Can your print head technology achieve a solid black black?

The Epson Stylus Pro 7800 can achieve a very solid black. In comparison to the Epson Stylus Pro 7600, this printer will produce a very neutral black using all of the inks. When black and white photographs are brought in to be printed, the commercial artists are very impressed with the neutrality and high contrast this printer has to offer.

59. What is the drop size in picoliters? Is there variable droplet size capability?

Epson uses what they call "Variable-Sized Droplet with AMC™ Technology. This technology produces variable-sized droplets as small as 3.5 picoliters.

Epson also uses Proprietary Active Meniscus Control (AMC) technology. This technology controls the curvature of every ink droplet within each nozzle before releasing it onto the media.

Every printer company, especially Encad, makes up some silly name for some often-immaterial aspect of their system. Apple Computer calls their system "Velocity Engine" or something equally insane. Names like this are created as smoke and mirrors. If you have to make up a silly name, this suggests there is not much meat or potatoes to speak about.

This present generation of Epson printers produces attractive quality: they should stress this quality and not continue to make up advertising jargon suggests that people reading their advertisement copies are not savvy enough to see through such drivel.

60. Is printing bi-directional or uni-directional? What are the different results in speed, in quality?

Printing can be set to either bi-directional or uni-directional using the ColorBurst RIP software. Uni-directional printing is twice as slow than the bi-directional printing, although the exact speed has not been determined. As far as quality, little difference can be made between the same print produced in each mode. With some medias such as the Epson Somerset Velvet, we did find that the uni-directional mode eliminated the slight banding seen on the prints.

61. Which materials can be printed at bi-directional settings?

Going by Epson paper only, the best materials that are produced using the bi-directional settings have been found to be on the Epson Premium Luster 250 and Epson Premium Luster 260. The Epson Semimatte has also produced acceptable results. When the bi-directional settings have been used on the Epson Enhanced Matte and Epson Somerset Velvet materials, it was hit-and-miss on seeing some slight banding.

Theoretically, the uni-directional printing has an advantage over bi-directional printing. Bi-directional printing has one pattern of printing in one direction and a different pattern when laying down ink in the other direction, which would seem to make the image less sharp.

62. What is the advertised DPI, and is it true dpi or “apparent” dpi? How is dpi presented (with what adjectives)? How is this dpi calculated? What is the true dpi of this print head? If the spec sheet uses the concept of “perceived dpi” or “apparent dpi” how they calculate perceived dpi instead of true dpi?

There is no industry standard to define “true DPI”. The DPI is considered to be 180 or 360 for a single color multiplied by the number of passes it takes to achieve good quality.

63. How many passes can this printer achieve?

The number of passes this printer allows is 8-passes based on the ColorBurst RIP.

64. How many print modes are there?

Using the printer drivers installed with the Epson Stylus Pro 7800, modes such as “High Speed”, “Finest Detail”, and “Edge Smoothing” can be used. An additional mode called “Flip Horizontal” is available to print a mirror image of the file, but in most cases, other advanced software such as Adobe Photoshop can perform features such as “mirroring” an image prior to printing.

65. Can you vary the material feed rate?

Using the ColorBurst RIP software, the material feed rate can be edited. This mainly will allow the user to make minute adjustments to the media to eliminate overprinting and underprinting (dark banding and light banding).

66. Which materials really ought to be printed at the uni-directional mode?

It has been tested, and through many trials, it has been found some of the materials that have high ink receptivity, such as the Epson Enhanced Matte, tend to show banding easier than other coated media such as the Epson Premium Luster 250.

67. How much will ink usage and cost rise when you select the higher dpi? Please provide, in writing, the ink usage figures for printing at economy mode (300 or 360 dpi) regular mode (600 or 720 dpi), high quality mode (1200, 1440) and what is the cost increase in ink usage printing at 2880 dpi? I do not mean for “5% coverage,” but what are the actual ink costs for 100% of the surface covered with ink at full ink load.

When printing at 2880, according to Jon Larusso, President of Parrot Digigraphic, “it is a waste of ink and you see color degradation”.

PRINTHEAD LIFE EXPECTANCY

68. How long do your print heads really last? Do you have that written in a warranty? If your longevity specs are in drops, please translate that into liters of ink or square footage of media.

We could not find detailed information regarding the life of the print heads¹. In theory they are supposed to be “permanent”. In reality, of course, an Epson print head wears out and has to be replaced. Replacement is about \$1,000, or more. It would be very rare to see this failure occur.

69. If piezo heads fail, who is responsible for paying for replacement heads? If thermal heads, who replaces the heads if they fail before their rated lifespan? What does each print head cost to replace? Distinguish price for the print head and also price for the service technician to come and do the installation if it is not user-replaceable?

Epson would replace it. If the failure is due to a head strike, it is considered a user error.

70. How often can you expect head strikes? What causes them? Who will replace the print heads and at whose cost?

Head strikes are the most common cause of premature head failure (another cause is constant flushing; the flushing seemingly wears out the nozzle system). A single head strike may wipe out only a few nozzles, or may kill the entire print head. Head strikes may be occasioned by a diverse variety of situations:

- Improper loading of the media, which make cause buckling, because the media is caught, or not going through the printer properly.
- Thin media can curl, thereby causing a head strike on the curled part
- Edge guards, which work on paper, canvas, and other thin materials, are not intended for thick material such as fome-cor.
- If media is absorbent, too much ink can make the material bubble up
- If media is curled or bubbled by heat; the head can hit the raised part
- If media is defective to begin with, or uneven, the head can hit the raised part
- If you have cut the material, such as fome-cor, the raised edge can cause a head strike.
- If adhesive pulls off the material (such as ControItak), the adhesive may get stuck on the nozzle plate of the head.

Some material is like sandpaper to the nozzle plate, some papers, and metal (and the metal edge is another danger to the print head nozzle plate).

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

No alarm or warning message is present if the substrate is too thick. Media fed through the Epson 7800 must be flat to safely feed it through.

¹ The specifications of how long an Epson piezo print head really lasts before it fails are skillfully buried. For years sales representatives have claimed the heads were permanent until we politely reminded them that permanent meant they lasted forever, and that this was not true (nothing lasts forever in a machine with moving parts). We found out it was untrue when many users wrote us to tell us their Epson heads had failed including on Epson, Rolands, and other printers. This is how we learn the truth: we ask and learn from experience of people who know. We never would have bothered to ask if we had been told the truth to begin with. When you eventually find the specifications on head failure, it is hidden behind another smoke and mirrors protection: they say it lasts so many droplets. It does not tell you how many liters of ink this represents.

PRINTHEAD POSITIONING

72. How many total number of printheads?

There are 8 print heads total: Cyan, Magenta, Yellow, Light Cyan, Light Magenta, Photo/Matte Black, Light Black, and Light Light Black.

73. Do you need to tell the printer where to start printing?

No.

74. Can you vary the gap (the distance from the print head to the media, which is the distance the ink droplets must fly)?

Yes, this can be changed by the platen gap setting on the LCD interface of the Epson 7800.

CLEANING & MAINTENANCE

75. How is head cleaning accomplished? Spray, vacuum, manual, other?

Head cleaning is accomplished by spitting ink through the nozzles. According to the Epson Stylus Pro 7800 printer's guide, the ink cartridges must have at least 50% ink left in order to perform a power cleaning.

76. How complex is it to align the print heads?

The alignment of the print heads is very simple to perform. The option to align the print heads can be found directly on the printer's LCD screen under Menu. The option is called "Head Alignment". The head alignment takes between 7-8 minutes to perform and you must be next to the LCD the entire time in order to perform a full head alignment for both uni-directional and bi-directional printing.

77. How many levels (strengths) of print head cleaning (purging and/or sucking) can be accomplished via the firmware (software)?

The strength of the print head cleaning cannot be controlled via the software. A nozzle check is a lower-powered cleaning option for the Epson Stylus Pro 7800. The printer will continue to clean the print heads automatically until the nozzles are clear. A power cleaning cycle is the high-powered cleaning option which will use more ink to clean and will require full attention during the cleaning cycle.

78. What part(s) of this printer tend to break down the most often?

Wipers/blades to wipe off the print heads tend to degrade over time.

79. What is the most delicate, or complex, or time-consuming cleaning or maintenance chore?

Using a small vacuum without bumping the print heads to clean out the dust and keeping the rollers and bed clean, including keeping the ends of the rollers clean, not just the flat surface of the roller that touches the media.

80. How long can the printer sit unused? How should a printer be prepared for sitting unused for a long time?

It is recommended that the printer be used at least once every few days in order to ensure nozzles are not clogging. According to Jon Larusso, it would be best to run a nozzle check if it sits for more than one day.

81. Do you need to have a band of printable colors along the edge, outside the main printed area, to keep all print heads 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.

CLEANING & MAINTENANCE: ROUTINE MAINTENANCE

82. What daily maintenance is required at start up in the morning?

If the machine is used regularly, a simple nozzle check should be the only maintenance necessary.

83. What daily maintenance is required at night?

Since the rollers tend to put enough pressure on the roll media to permanently add a pressure mark to it if held in one spot for a long time, it may be a good idea to unload the media from the rollers.

84. What daily maintenance is required if you print the entire day long?

If the entire day is spent printing, no maintenance is necessary unless you are experiencing problems such as banding or other quality issues.

85. What other periodic maintenance is required by the operator?

Nozzle checks would be the only necessary maintenance other than keeping dust out of the printers.

CLEANING & MAINTENANCE: WASTE

86. To initiate a purge, where is the control or button? Is it software generated or do you have to press a button? Where is the button located?

It is located on the printer itself.

87. Can you select which ink lines/print heads to purge, or can you only purge in clusters or all or nothing?

They must all be purged.

88. The ink that is purged, where does it go? Into a drain/waste bottle, or into a drip tray?

All ink waste is sent to a maintenance tank within the printer.

89. How should you handle the drip tray or maintenance tank? How much ink do they hold? How often do they fill up?

The maintenance tank contains an absorbent material, which, according to Mr. Larusso, is "environmentally friendly". The tank can be thrown in the garbage. There is an indicator light on the LCD, which shows how empty the tank is.

ERROR MESSAGES

90. Are any error messages curious, or unintelligible?

There have not been any errors that are cannot be looked up.

PRINTER DRIVERS & RIP SOFTWARE: FEATURES**91. Is your printer and/or RIP Pantone certified?**

The full version of ColorBurst RIP 4 is Pantone certified. The lite version is not a Pantone RIP.

92. Can the RIP perform nesting of various sized files across the full width of the media?

The lite version does not offer nesting. The full version definitely offers nesting and ink limiting capability (you can potentially save the cost of the RIP software by the ability to control the ink limit).

93. Can the RIP do rotating of any and all files in any and all software? This implies ability to rotate TIF files from Photoshop as well as files from QuarkXpress, PageMaker, or InDesign.

No.

94. Does your RIP form black from K or from CMY? Can the user select which to use or is it permanently locked into one mode in the RIP?

Yes, the user can select which to use.

95. If your printer makes black from CMY, is that because your K won't stick to glossy media? This may happen with pigmented inks.

Mr. Larusso stated, "It depends on the density and tonal character of the media. Matte ink is not compatible with gloss media".

96. What other printers can this same RIP software? Or is this RIP restricted solely to this one printer?

We have three Epsoms that use the ColorBurst RIP. This RIP is Epson specific. The ColorBurst RIP ProLab version can be licensed for the following printers:

- Kodak LVT's, Film Recorders
- Durst Lambda 130, Lambda 76, Epsilon 30
- FujiFilm PG 3500, PG 4000, PictroProof, Frontier
- Epson 9800, 9600, 10600, 9000, 9500, 10000, 7800, 7600, 7500, 7000, 4800, 4000
- Encad NovaJet 880, 850, 750, 736, 700, 630, 500
- HP 5000 series, 3000 series, 2000 series, 1000 series, HP 755, 750, 488, 450, 430
- Symbolic Sciences LightJet series
- Kodak 5260
- Roland FJ, SJ, and CJ series

Of course, you would have to pay for the license to use the RIP on these machines. Actually, ColorBurst is the RIP used to run industrial Vutek printers.

97. Please make a list of those features your RIP does not provide that your competition does provide (irrespective of the price difference).

The ColorBurst Lite RIP does not import 3rd party options. It also does not include Pantone Certification.

98. 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?

Yes, the ColorBurst RIP will work on both PC and MAC

99. Although we tend to use PCs, is your printer equally Mac friendly?

Yes, the Epson 7800 drivers are supported on both MAC and PC.

PRINTER DRIVERS & RIP SOFTWARE: WHAT SHIPS WITH THE PRINTER

100. Does the price of your 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?

No, the printer does not come with a RIP unless the Pro version of the printer is purchased. In this case, a lite version of ColorBurst RIP is received.

Since we already have a full version of ColorBurst RIP 4 for the Epson 7600, we could use this for the Epson 7800.

101. Can your printer function realistically with no RIP whatsoever? If so, what features are missing or slow down without the use of RIP?

Yes, an Epson printer will function fine with no external RIP software whatsoever. If serious commercial production will be done with the printer, a complete version of a RIP will be necessary. You have to check, carefully, to make sure you can upgrade from the Epson lite version to the ColorBurst full version. This is because Epson sells the lite version, not ColorBurst directly. But it is ColorBurst that sells the full production version.

INK

102. Does the printer itself have a means to keep track of ink usage? Is this a guesstimate, or an actual count of droplets fired?

The ink usage is counted in a Usage Count. This option can be found under the Menu on the printer's LCD panel.

103. How much ink is used to print a square unit?

According to Mr. Larusso, it "depends on the density and resolution you are printing at".

104. Where are the printer's ink containers located? Front, back, or sides?

The ink cartridges are located on the front side of the printer. Four of them are located to the left and four are located to the right of the media on the lower half of the printer.

105. How much ink does the ink container in the printer hold?

Depending on the ink purchased, the cartridge can hold 110ml, 220ml, or 440ml.

106. How is new ink added? Pouring into the on-board container? Switching the container to the new ink container?

New ink is added by opening the front panel that encloses the cartridges, lifting the ink lever, pulling out the old cartridge, inserting the new cartridge, lowering the ink lever, and closing the front panel.

107. Is your ink unique to your printer? The downside is that few media will be available. That is the disadvantage of Epson's unique inks. Similar downside with Seiko and XES oil-based inks. The same problem is true with life-solvent or eco-solvent inks. Because so few printers use unique inks, not many media companies bother to make a low-cost paper for such a small market. So if you buy a printer with unique ink (Epson, etc), your media (and ink) costs may be substantially higher over the total cost of ownership. HP pigmented ink, in distinction, is a standard international ink used in several other printers. HP print heads are used in ColorSpan and Western Graphtec printers too. This means that lots of economical media is available for these thermal print head machines.

The ink is unique to the Epson 4800, 7800, and 9800.

108. Does the printer have a dryer? If not, why not? If not, how can you explain that other printers are adding dryers and that several after-market companies are now making dryers?

No, but the ink usually dries fairly fast.

109. How often might your print heads 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?

Losing a color (due to a clogged head) was primarily something that frequently happened to Roland water-based Giclee printers that used Epson print heads circa 2000-2003. We do not hear about this issue as much anymore. Anything is possible, but having a clog knock out an entire color would mean that you should not risk printing overnight. But I know people that use an Epson printer overnight on a regular basis, and they do not frequent color failure. Naturally, this assumes the printer is loaded with enough ink to last printing all night.

110. How can you see the remaining ink level? Do you have to ask to see the ink mode, or is the status available at all times?

There is an ink level status which show up on the LCD at all times in the form of bars. To see an exact percentile of ink left, the total ink left in the cartridge must reach below 10%.

111. Is there an issue with “Ink Starvation”?

We have not experienced any.

112. What is the process your printer uses to clean its print heads? Does the printer do this automatically? Or does the operator have to do this by hand? How much ink does cleaning the heads waste? How often must this happen?

The printer will clean the heads automatically. You do need to initiate the sequence via the Menu interface on the printer.

113. If your printer cleans its heads with liquid money (in other words if it uses costly ink to push impurities through the heads), why does your print head technology allow such defects? What if one purge does not work? How many purges does it take? But if there are six or eight inks in my system that may cost about \$50 to clean the heads? How does this affect total cost of ownership?

The system uses its auto clean feature to clean the print heads. Users do indeed complain about the amount of ink used to clean the nozzle blockages. Actually, it is not necessarily gunk in the nozzles; it may be the air in the system. It is tough for a piezo print head to use pressure to force ink out of the nozzle if there is too much air in the reservoir (air, instead of ink).

114. Some printers now have “counters” which report how much ink has been expended for each print. Most printer manufacturers admit that these counters are generic estimates: they do not really count how much ink is actually squirted out the heads. So how about your printer? Does it even have a counter and if so, what is it really counting?

According to Mr. Larusso, the counter “counts drop to drop”. The counter will tell ml per print. Large prints will be more accurate.

115. Is there an ink low alarm?

The ink bar indicating the low ink cartridge will blink if the ink is ready to be changed due to low ink.

116. Is there an ink-out alarm, or only a message on the monitor?

A diagonal line will form inside the ink bar that indicates an empty ink cartridge. It will continue to flash on the LCD screen and will not allow prints to continue until it is changed.

117. Does printing stop when one ink is out, or does the printer keep printing (hence wasting the other ink, and the media)?

Once the printer is out of ink, the printer will immediately discontinue printing.

118. Does the printer attempt to get you to put in fresh ink when there is still a lot of ink left in the container? I believe there was a Class Action lawsuit against Epson for this.

We have not had any experience with this.

119. Is the print usable when you have to refill ink halfway through printing?

The print is not usable. If ink is refilled, the printer will need to be reset and the print does not leave where it left off.

120. What color shift do your inks go through during their drying cycle?

Mr. Larusso stated that, "it has a curing time depending on the media, temperature, and humidity. The color is stable to ½ of a AE within 5 minutes".

121. What other problems have people reported with your inks?

Scratch resistance and gamut. Overall archival performance can be improved.

122. How is air removed from the ink delivery system and/or removed from the print head?

Mr. Larusso believes it is a close looped delivery system and air should not enter the system.

123. What filters are on the ink system to trap particles?

There are no changeable filters to prevent nozzle clogs.

INK: COST

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

Ink comes in cartridges and can be ordered in the quantities of 110ml, 220ml, or 440ml.

125. What is the cost per container? What is this cost translated to liters?

The cost of ink is about \$112.00 for a 220ml cartridge based on the price offered by Parrot Digigraphic. This is equivalent to approximately \$0.51 per ml of ink. This is a better value than the 110ml cartridge, which is \$69.95. You will be paying about \$0.64 per ml of ink with this option.

126. How much ink is used up during installation of the printer? If a piezo printer, does that mean I have to buy 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?

The printer used about 30% of the ink (33ml) from each color during installation. Most of this ink was used to fill the ink tubes, reservoirs, etc, but there was a percentage purged prior to the first print. The printer ran out of ink before we completed all test prints.

INK: LONGEVITY

127. Is the ink of itself waterproof? Or does water resistance happen only on some kinds of media?

Pigmented ink is dramatically more water resistant than dye ink. However, the ability of pigmented ink to be water-resistant depends to some degree on which media is printed on.

128. What about solvents such as cleaning solvents? Do they mar, dull, or wash away the ink or change the surface quality?

It is not wise to use any cleaning solvents on any inkjet print. The extent of the damage depends on the media and solvent used. The most likely damage to a Giclee print is the fragile surface of the artist's canvas being scratched or rubbed. This causes the delicate and thin ink receptor layer to come off the surface of the canvas. It needs to be top-coated in order to be protected.

129. What happens if you seal your prints behind glass to protect them? Will the ink outgas and smear the glass?

There were no issues with outgassing of Epson prints with earlier dye ink chemistries. We do not put our Epson prints behind glass anyway, and thus have no outgassing issues that affect us or the prints.

130. What is the shelf life of the ink?

According to the Printer's Guide for the Epson Stylus Pro 7800, the shelf life of the ink is 2 years from the production date of the ink if it is unopened or 6 months if the ink is opened.

131. Do you have to shake the ink to get the pigments out of being settled?

It is recommended the ink cartridge be shaken a little prior to installation of the cartridge.

132. Does the ink rub off?

If the ink limit is managed correctly, the ink will not rub off under normal circumstances.

INK: COLOR GAMUT**133. How many colors are used in the ink-set being evaluated here?**

There are a total of 8 colors: Cyan, Light Cyan, Magenta, Light Magenta, Yellow, Photo Black, Light Black, and Light Light Black.

134. What colors work best?

Greens and oranges come out excellent. The colors are more dependent on the Light Light Black than the Light Cyan and Light Magenta.

135. To what degree does the color gamut shift, as the ink gets lower in the ink chambers?

None, this mainly happened with Encad printers.



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

Yes. If someone with experience manages the software, the ink limits and media advance can be set for each type of media used on the printer. This will effectively minimize the possibility for banding and puddling of ink. Banding is not as much an issue with the new Epson printers as it was with Roland and Epson printers of previous generations.

MEDIA**137. Is print head height adjustment available? Is it manual, automatic, how much?**

It is adjustable. The height is adjusted via the LCD Menu on the printer's panel.

138. What kinds of guide bars exist?

There is a white ruler printed on the hood of the Epson Stylus Pro 7800 which helps you line up sheet media with the dots on the lower portion of the printer for a straight feed. No physical bar or edge is present for the lining up of the media.

139. What about the take-up reel? Does it work unattended?

If a take-up reel were purchased, the media would need to be manually set onto the reel as on any other printer in this entry-level price range.

140. Is this printer intended to accept canvas and watercolor paper?

Yes.

141. Is there a cutter on-board? Is it manual or automatic?

There is an automatic cutter on-board. There is an option to shut off the cutting mechanism with each print.

142. Is the cutter up near the platen (where cutting residue can eventually clog the print head nozzles), or is the cutter further out, where detritus is not as much an issue?

The cutter is conveniently placed further out, below the platen in order to prevent the print heads from being clogged.

143. Is there an edge for a hand held X-acto blade or knife to cut printed media off the printer?

No.

144. What about printing on textiles?

The Epson 7800 will print on textiles, but custom profiles should be built to accommodate these. In addition, after the textiles are printed, they would not be washable. The printed textiles would have to be handled in a similar fashion as any other print that came off of the printer.

According to Mr. Larusso, "the Epson 7800 is not designed for textiles" and the outcome will not be high density".

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

The Epson 7800 printer will print on backlit material, but there is an extended drying time necessary for the prints. Otherwise, if the ink limit is lowered too much, the colors tend to lose their density. It depends on the ink-receiving layer.

146. Do you have media length-remaining sensors on your printer? Is it manually set or automatic?

No.

147. What thickness can this printer handle?

The thickest media we have fed through the printer so far is 23 mil. The printer, however, can print on materials up to 57 mil (1.5mm).

148. What materials can this printer print on perfectly?

There is a full range, depending on the color management done with the material.

149. Can you print on clear media?

We have not had a chance to test this printer on any clear inkjet material as of yet, but by feeding a clear substrate through, the printer successfully detected an edge and printed fine lines and text with perfect clarity.

150. Can the printer print edge-to-edge?

Yes.

151. What kinds of media ought to be laminated? How often must you laminate?

Epson Premium Luster can be laminated as well as the Epson Premium Matte. We laminate based on demand. Canvas is not laminated (it looks tacky), but you definitely need to topcoat it.

152. How much acclimatization time is needed for the media?

It always helps to have the media in the same room as the printer so they are both at the same temperature and humidity level. Inkjet media is made to soak up moisture (from the ink) so keep the media wrapped in a non-porous plastic when not in use.

MEDIA: FEED**153. What core diameter(s) of media will this printer accept?**

This printer will accept 2" and 3" core media.





154. What length of roll is accepted?

A 2-inch core media will allow up to 150 feet and a 3-inch core media will handle up to 673 feet of media on a roll for this printer.

155. What is the maximum roll diameter?

3 inches is the maximum diameter this printer will allow.

156. Can you manually sheet-feed media? Does it feed easily?

Yes, it is fed through the top. A guide edge is printed on the top cover of the roll spindle to direct a straight feed into the machine.

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

No, it cannot. A sensor will automatically detect the edges of the media. In order to protect the printer from spraying ink onto the non-media surface, the printer will discontinue finishing the pass beyond the point of the edge.

158. Can you adjust the rate of media feed?

The rate of media feed is adjusted through the ColorBurst RIP software we use.

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

The media is fed through a series of pinch rollers against grit rollers across the entire 24" span of the printer.

160. What size? What positions are the rollers relative to each other?

There are five pinch rollers per partition along a single grit roller, which spans the printer's width.

161. Are pinch rollers traditional or a special size/shape/position?

The pinch rollers are traditional rollers, similar to those found in other Epson printers.

162. How are the pinch rollers raised?

The pinch rollers are raised when using the lever on the right hand side of the printer, which is used to load the media into the printer.

163. Can the pinch of the pinch rollers be varied?

The pinch rollers cannot be varied in pressure.

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

Roll media is held above the feeding position via a spindle.

165. Is the feeding area for roll-fed material physically attached to the printer or is it out in front and not attached (as on the GRAPO Octopus)

The roll-fed area is directly attached to the top of the printer as part of the printer.

166. Does the roll-fed material feed evenly?

The roll-fed media feeds very easily and very evenly. We have not had any errors when feeding roll media. There are no reels media has to wrap around in order to feed through. The media feeds directly from the roll, and through the pinch rollers.

MEDIA: ISSUES**167. What media will not work well with your printer? What media will not work at all with your printer?**

Clear film and glossy or high gloss paper does not work well with the printer. This media works good for text and looks beautiful once it comes out, but even after over 24 hours of drying time, the ink smears when gently rubbed. This media tends not to hold the ink well.

Since this printer uses Epson pigmented ink, it works only with media that is made to work with Epson pigmented ink.

The general truism is: if you stick with Epson-certified media (or in the case of buying the printer from Parrot Digigraphic, if you stick with Epson+Parrot certified media), then you will not have many issues.

If you experiment with more economical media, here is where you save money in media price, but you may spend more time (and headache) figuring out which media works. You will also tend to do more color management, etc. Full-time pros, or dedicated aficionado photographers or artists, who are patient, can indeed get after-market media to work perfectly. But if you are not the kind of person who wants to learn the inner secrets of custom ICC color profiles, and ink limiting in your RIP software (full version required), then stick with media from Epson and/or Parrot.

168. 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 your printer offer?

The Epson 7800 has only one bar for media. No other bars or locations on the printer allow more than one roll to be loaded at a time.

169. What about wheel marks or feeding roller path marks?

The Epson Stylus Pro 7800 automatically trims the ends of the print on the roll, but creates a 2" strip of waste after it has been unused for a while. This prevents the ink being applied to the material where the pressure marks from the roller are held.

170. Can the media feed without skew?

Roll media feeds very easily without a skew. If using a sheet-fed media, as long as the straight edge of the media is lined up with the white edge or the ruler printed on the printer's hood indicating the 0" mark and the other end of the media is lined up below the rollers along the punched metal holds, the media will feed 100% of the time without any skew.

IMAGE QUALITY ISSUES**171. What sort of things causes image quality issues?**

Dust in all printers. Bits of the cut media (that is cut by the auto-cutter) are such a problem on the Epson that most professional users don't or can't use the auto-cutter.

172. What about type (letters), especially small letters? Can your printer do a nice job: good sharp crisp alphanumeric and line designs? Do you get fuzzy edges even with dye ink, or crisp edges?

The Epson Stylus Pro 7800 does an excellent job a recreating fine text. Test as small as 1pt. font has appeared on the tested Epson Premium Luster 250 material and even with a loop, shows no fuzzy edges. With text, the higher the resolution of the print, the less fuzzy the edges became.

173. What about grayscale prints (in easier to understand language, what about black-and-white prints)? Do B&W prints turn out properly grayscale, or greenish or reddish instead of neutral gray?

The Black and White results were better than on the Epson Stylus Pro 7600, but they were not yet measured with an instrument. Again, the machine ran out of ink before the tests could be completed. We have excellent black-and-white images from using a dedicated Black and White MegaVision camera. We will have the results in an update.

Whether your prints turn out greenish (typical Epson) or magenta (typical of an HP) depends on how well the color is managed. I have seen entire HP exhibits of Black and White prints with a magenta tint in an HP booth. Epson prints also have a reputation for not always being flawlessly neutral. And, if you work hard at your HP prints, you can indeed achieve relatively neutral results.

174. What is the situation with gloss differential or bronzing?

Gloss differential is still noticeable, but mainly it is recognized from an angle and on materials such as a semi-gloss or luster material.

175. What is the situation with metamerism?

The ink system is improved. Also, stated by Mr. Larusso, "the order in which the ink is laid down impacts the metamerism and the nature of the pigments themselves".

176. Can you please explain banding and list five potential causes of horizontal banding?

Banding is a phenomenon that will occur when the passes of the printer do not line up for reasons such as: lack of media feed, too much media feed, high moisture, or even print heads which are not lined up.

177. Can a glossy finish be achieved?

Prints done on High Gloss photo paper look nice when printed, but the material scratches and is damaged extremely easily and the ink requires extra drying time.

178. Is there banding in areas of solid black?

No, not under normal circumstances.

179. What causes banding in this particular system?

Sometimes if bi-directional printing is selected when printing to certain medias, banding will occur. Also, if the media feed is mal-adjusted and creates a gap or overlaps between passes.

180. How much banding is reported with this particular print head?

It depends on the resolution of the image and whether it has had bas interpolation or not.

181. Does glossy media scratch easily, even just running through the printer?

Glossy media will run through the printer fine, but scratches very easily.

182. How susceptible is the ink to abrasion?

Prints must be handled with great care. Although the type of media it is printed on affects the susceptibility of the ink, on some of the more common Epson medias such as an Epson Semimatte or Epson Premium Luster, as much as a light fingernail rub can cause the print to be damaged.

183. Is ink-drying time an issue?

Ink drying time is not an issue on any of the Epson materials tested thus far.

APPLICATIONS

184. Can you print on textiles or fabrics? How do you handle the ink that gets through the weave?

It is possible to print on fabrics. Ink does not soak through the weave, but if it were, the ink would make a mess on the surface of the printer. This printer is not meant to print on textiles. Unlike the HP 5000 or Mimaki JV4 printers, the Epson 7800 is meant to reproduce photographic and fine art pieces. This printer also offers a much better black and white option.

185. Can the printer detect the edge of a clear film?

Yes.

186. Can the printer print on a clear substrate?

Yes, it can print on a clear substrate to some degree. If the substrate were receptive to inkjet pigmented inks, it would work much better than a clear plastic film.

187. Does the printer allow for perfect registration if printing double-sided?

No.

PRODUCTIVITY & ROI (Return on Investment)

188. Can you sell the output at the machine's fastest output speed or is the quality at that speed not acceptable to most client standards?

Draft quality is not acceptable for fine art applications.

189. But what about speed claims? Our users are not in a laboratory. We are not using a wide version that the original tests were done on, but a narrower version. What speed can our people really achieve with a unit not as wide as the one on which the speed claims were based?

Speeds claimed and speeds achieved are two completely different aspects of reality. The more adjectives they use (like when Roland says they have blazing speed), the more likely it is that the printer is so slow they have to invent mumbo jumbo to deter the end-user from realizing how slow the printer really is.

Epson printers today are not as painfully slow as they were in past years. Epson should just say their precise speeds, and not try to exaggerate. Plus, it might help to compare their speed with the Canon iPF5000... or even an Encad NovaJet 1000i.

COMPARISONS WITH OTHER PRINTERS

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

They will be looking at the HP z2100, z3100, and Canon printers.

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

Epson is very wasteful of ink, and HP is better on the network.

192. What aspects of the selected printer help decide in its favor?

"Canon is hard to color manage for photo media, and media loading can be more difficult", according to Mark Richards, Digital Imaging Specialist at Parrot Digigraphic.

ADVERTISING CLAIMS: realistic, exaggerated, or misleading?

193. What have been recurring maintenance issues?

According to Mr. Larusso, "By in large, very reliable; none". It would have to be a result of abnormal maintenance or nozzle clogs.

GENERAL CONSIDERATIONS

194. How many of your printers of this model are in use in the USA? Not how many are in dealer showrooms, not how many have been "sold" on paper, but how many are functioning in actual use printing signs, posters, banners, textiles, etc. in commercial establishments.

There are countless numbers of Epson 7800's being used in the U.S.A. In Europe and the rest of the world, the Giclee phenomenon is not as strong. In Europe, they attempt to sell Epson printers as dual-CMYK as CAD and GIS printers, since there are not enough photographers or artists who print their own work at home to create a market in Europe comparable to the strong entrepreneurial market in the U.S.

195. How would an outsider describe your printer? Not how your ads claim, but how do other people view your printer as to whether it is easy to use, takes care of itself, does not require you to personally become a repair or maintenance technician.

Many outsiders think the printers as well as the printed media are both high quality.

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

One of the first days we had the printer, we let it print high quality prints overnight. The next morning, we found that the printer had printed the images without interruption. Mr. Larusso does not recommend running the printer overnight.

197. The following question is not meant to be mean but is to protect the people who spend their money buying your printer. Are you sure that your company will exist over the next three to five years in a manner that can secure the investment of our company in buying one of your printers? Is it certain that spare parts will continue to be manufactured or at least readily available? Is there anything in your recent corporate past or upcoming future that might cause a reasonable person to feel justified in asking this question?

Epson is a well-known brand name; we do not foresee any lack of spare parts or customer support in the years to come.



First issued June 2006 / **Most recently updated February 2008.**



As soon as you have your UV-flatbed printer, your printshop will desire to have a cutter or trimmer.

First you need to trim. Simple cutting of the edges of your board so the edges are neat and clean. Then of course some clients will ask if you can do contour-cutting. This means you can offer additional services and earn additional income.

The best way to learn about trimmers is to ask a distributor who has more than one brand. This way they do not push their house brand and denigrate brands that they do not carry. Also, you want a real person that actually has experience. Otherwise you get a "box pusher" who is simply an Internet sales person, who does not know trimmer from dimmer.

The person we suggest is **Mike Lind** because his company, **Reprographic Designs**, handles all leading brands: KeenCut, Neolt, Meteor Metoschnitt, RotaTrim, etc. You can contact him at 1 281 492 2714 or malind@msn.com.

His company is also the Master Distributor for Cruse reprographic scanners in the US and adjacent countries.



XY Cutter Options

In a period of economic recession printshops will tend to ask about options that are priced lower than high-end prices. Thus we suggest a possible solution at mid-range price: Gerber M class cutters. I have inspected two huge factory complexes of Gerber Scientific in 2008 (especially their cutters for fabrics) and will be visiting their facilities again in 2009.

To contact Gerber:

Phone (US): 800-222-7446, email: cservice@gspinc.com
 Fax: 800-227-6228 or 860-648-8064
 Phone (Intl): 860-648-8028, email: gspinternational@gspinc.com

We have seen Gerber cutters at work during major trade shows, both in Europe and in the US. Gerber has dealers all across the US and Canada, and in Europe is served by Spandex.

When you acquire a UV-curable wide-format printer you will eventually learn that an XY flatbed cutter is a useful accessory for thick rigid materials. The advantage of having an XY cutter is that you are selling not just the print, but a finished work. To stay ahead of the competing printshops in your city it helps to offer your clients a solution for every step of the printing workflow.



Dr. Hellmuth shows a sample processed by the Gerber M Series cutter exhibited at GraphExpo '08.

Gerber M Series cutter at ISA '08.

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 than 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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Starting in 2008, updates on UV-curable wide-format inkjet printers are available for all individuals and companies which have a subscription, or to companies who are research project sponsors. If you are a Subscriber or manager in a company that is a research sponsor, you can obtain the next update by writing ReaderService@FLAAR.org. If you are neither a Subscriber or a research sponsor, simply order the newest version via the e-commerce system on www.wide-format-printers.NET. Please realize that because we have so many publications and many are updated so frequently that we have no realistic way to notify any reader of when just one particular report is actually updated.

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

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

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

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

Please Note

This report has not been licensed to any printer manufacturer, distributor, dealer, sales rep, RIP company, media, or Ink company to distribute. So, if you obtained this from any company, you have a pirated copy.

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.

If you intend to quote any portion of a FLAAR review in a PowerPoint presentation, if this is in reference to any product that your company sells or promotes, then it would be appropriate to license the report

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

Legal notice

Inclusion in this study by itself in no way endorses any printer, media, ink, RIP or other digital imaging hardware or software. Equally, exclusion from this study in no way is intended to discredit any printer.

Advisory

We do our best to obtain information which we consider reliable. But with hundreds of makes and models of printers, and sometimes when information about them is sparse, or conflicting, we can only work with what we have available. Thus you should be sure to rely also on your own research, especially asking around. Find another trustworthy end-user of the same make and model you need to know about. Do not make a decision solely on the basis of a FLAAR report because your situation may be totally different than ours. Or we may not have known about, and hence not written about, one aspect or another which is crucial before you reach your decision.

The sources and resources we may list are those we happen to have read. There may be other web pages or resources that we missed. For those pages we do list, we have no realistic way to verify the veracity of all their content. Use your own common sense plus a grain of salt for those pages which are really just PR releases or outright ads.

We are quite content with the majority of the specific printers, RIPs, media, and inks we have in the FLAAR facilities. We would obviously never ask for hardware, software, or consumables that we knew in advance would not be good. However even for us, a product which looks good at a trade show, sounds good in the ad literature, and works fine for the first few weeks, may subsequently turn out to be a lemon.

Or the product may indeed have a glitch but one that is so benign for us, or maybe we have long ago gotten used to it and have a 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.

But even when we like a product and recommend it, we still can't guarantee or certify any make or model nor its profitability in use because we don't know the conditions under which a printer system might be utilized in someone else's facility. For ink and media, especially after-market third-party ink and media, it is essential that you test it first, under your conditions. We have no way to assure that any ink or media will be acceptable for your specific needs in your specific print shop. As a result, products are described "as is" and without warranties as to performance or merchantability, or of fitness for a particular purpose. Any such statements in our reports or on our web sites or in discussions do not constitute warranties and shall not be relied on by the buyer in deciding whether to purchase and/or use products we discuss because of the diversity of conditions, materials and/or equipment under which these products may be used. Thus please recognize that no warranty of fitness or profitability for a particular purpose is offered.

The user is advised to test products thoroughly before relying on them. We do not have any special means of analyzing chemical contents or flammability of inks, media, or laminates, nor how these need to be controlled by local laws in your community. There may well be hazardous chemicals, or outgassing that we are not aware of. Be aware that some inks have severe health hazards associated with them. Some are hazardous to breathe; others are hazardous if you get them on your skin. For example, some chemicals such as cyclohexanone do not sound like chemicals you want to breathe every day. Be sure to obtain, read, and understand the MSDS sheets for the inks, media, and laminates that you intend to use. Both solvent,

eco-solvent, and UV-curable inks are substances whose full range of health and environmental hazards are not yet fully revealed. It is essential you use common sense and in general be realistic about the hazards involved, especially those which are not listed or which have not yet been described. FLAAR is not able to list all hazards since we are not necessarily aware of the chemical components of the products we discuss. Our reports are on usability, not on health hazards.

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

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

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 jury-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 lifted by cranes and run over a rough pot-holed highway or kept in smothering 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 do 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 your 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 and 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.

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

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

It is typical for some enthusiastic vendors to claim verbally that their printer can print on anything and everything. But once you unpack the printer and set it up, you find that it requires primer on some materials; on other materials it adheres for a few weeks but then falls off.

And on most hybrid and many combo printers, some heavy, thick, or smooth-surfaced materials skew badly. Since the claim that the printer will print on everything is usually verbal, it is tough to prove this aspect of misleading advertising to a jury.

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

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

Be sure to check all FLAAR resources

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

So it may be best to ask for personal consulting. The details of the problems with the ColorSpan 5400uv series are rather complex: namely the center row of the Ricoh printheads. This would require an expensive graphic designer and consultants to show the details. And

the design of the printhead would probably be altered by the time we did any of this anyway. So it is essential to talk with people: with other end-users, and with FLAAR in person on a consulting basis.

Acknowledgements

With 15 employees the funding has to come from somewhere, so we do welcome project sponsorship, research grants, contributions that facilitate our educational programs, scholarships for co-op interns and graduate students, and comparable project-oriented funding from manufacturers. The benefit for the end-user is a principle called academic freedom, in this case,

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

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

Besides, it does not take any money to see which printers and RIPs function as advertised and which don't. We saw one hyped printer grind to a halt, malfunction, or otherwise publicly display its Incapabilities at several trade shows in a row. At each of those same trade shows another brand had over 30 of their printers in booths in virtually every hall, each one producing museum quality exhibits. Not our fault when we report what we see over and over and over again. One of our readers wrote us recently, "Nicholas, last month you recommended the as one of several possible printers for our needs; we bought this. It was the best capital expenditure we have made in the last several years. Just wanted to tell you how much we appreciate your evaluations...."

FLAAR is a non-profit educational and research organization dedicated for over 36 years to professional photography in the arts, tropical flora and fauna, architectural history, and landscape panorama photography.

Our digital imaging phase is a result of substantial funding in 1996 from the Japanese Ministry of Public Education for a study of scanning and digital image storage options. This grant was via Japan's National Museum of Ethnology, Osaka, Japan. That same year FLAAR also received a grant of \$100,000 from an American foundation to do a feasibility study of digital imaging in general and the scanning of photographic archives in particular.

The FLAAR web sites began initially as the report on the results of these studies of scanners. Once we had the digital images we began to experiment with digital printers. People began to comment that our reports were unique and very helpful. So by 1999 we had entire sections on large format printers.

FLAAR has existed since 1969, long before inkjet printers existed. Indeed we were writing about digital imaging before HP even had a color inkjet system available. In 2000 FLAAR received an educational grant from Hewlett-Packard large format division, Barcelona, Spain, for training, for equipment, and to improve the design and navigation on the main web sites of the FLAAR Network. This grant ran its natural course, and like all grants, reached its finishing point, in this case late 2005.

In some cases the sponsorship process begins when we hear end-users talking about a product they have found to be better than

other brands. We keep our ears open, and when we spot an especially good product, this is the company we seek sponsorship from. It would not be wise of us to seek sponsorship from a company with a sub-standard or otherwise potentially defective printer. So we usually know which printers are considered by end-users to be among the better brands before we seek sponsorship. After all, out of the by now one million readers, we have heard plenty about every single printer out there.

We thank MacDermid ColorSpan (now part of HP), Hewlett-Packard, Parrot Digigraphic, Color DNA, Canon, Gandinnovations, and other companies for providing funding for technology training for the FLAAR staff and our colleagues at Bowling Green State University in past years and for funds to allow us to attend all major international trade shows, which are ideal locations for us to gather information. We thank Sun LLC, Caldera, Raster Printers (Rastek), DEC Lex-Jet, DigiFab, Barbieri electronic, Mutoh Europe, IP&I, DIII, 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.

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](http://www.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, Gerber, Grapo, IP&I, Mimaki USA, Mutoh, DIII, GCC, NUR, Océ, Shiraz (RIP), 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. We are under NDA as to the subjects discussed but it is important that we be open where we have visited. Mimaki Europe has had FLAAR as their guest in Europe to introduce their flatbed UV printer, as have other UV-curable manufacturers, again, under NDA as to the details since often we are present at meetings where unreleased products are discussed. Xaar has hosted an informative visit to their world headquarters in the UK. You don't get this level of access from a trade magazine writer, and I can assure you, we are

provided much more detailed information and documentation in our visits than would be provided to a magazine author or editor. Companies have learned that it's a lot better to let us know up front and in advance the issues and glitches with their printers, since they now know we will find out sooner or later on our own. They actually tell us they realize we will find out on our own anyway.

Contributions, grant, sponsorships, and project funds from these companies are also used to improve the design and appearance of the web sites of the FLAAR Information Network. We thank Canon, ColorSpan, HP, ITNH, and Mimaki for providing wide format printers, inks, and media to the universities where FLAAR does research on wide format digital imaging. We thank Epson America for providing an Epson 7500 printer many years ago, and Parrot Digigraphic for providing three different models of Epson Inkjet printers to our facilities on loan at BGSU (5500, 7600, 7800). We thank Mimaki USA for providing a JV4 and then a Mimaki TX-1600s textile printer and Improved Technologies (ITNH) providing their Ixia model of the Iris 3047 giclee printer.

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

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

We thank Betterlight, Calumet Photographic, Global Graphics, Westcott, Global Imaging Inc. Phase One, and Bogen Imaging for helping to equip our archaeological photo studios at the university and its archaeology museum in Guatemala. Heidelberg, 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 Heilmuth). 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 Hewlett-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 primary 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, 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.

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.

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