FLAAR Reports

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Direct printing on Textiles

DigiFab StampaJet I-64

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Contents

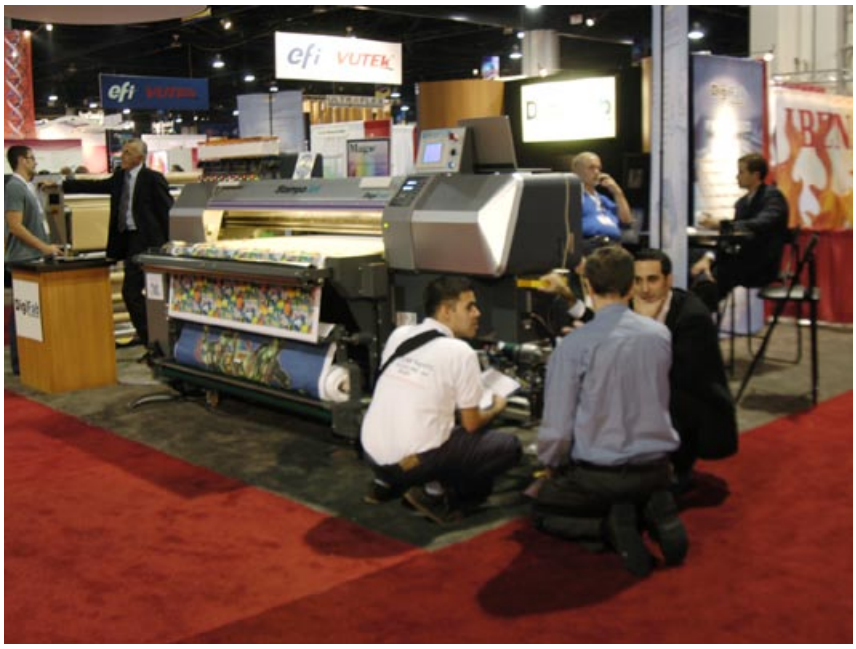
THE BASICS

1. Brand name, model?
DigiFab StampaJet I-64.

2. What is the nature of the company behind the brand name? Is this company the manufacturer, distributor, or rebranding?
DigiFab's StampaJet is a collaboration effort consisting of design, manufacturing and rebranding of several existing technologies.

3. Does the machine manufacturer also manufacture inks for textiles?
Yes. DigiFab offers a number of brands of inks in its website, although designs an OEMs some of the inks and distributes some others.

4. Does the machine manufacturer also make textiles to print on with this machine?
Yes. DigiFab is also manufacturer of a wide range of fabrics meant to be printed on.



Most of the information for this report was gathered at SGIA 08, where DigiFab personnel explained to us in detail how the StampaJet textile priner works.
Left to right: Jose Melgar, Nicholas Hellmuth (FLAAR) and Alex Izmirlian (DigiFab).

5. When and where was this model first introduced?
We first saw it at SGIA 08, although we have to check with DigiFab whether it was introduced there or elsewhere.

6. Is this printer mature technology or still in alpha-stage or beta-stage?
The printer is based on proven technology, it has been thoroughly tested , and it is in release mode.

7. List price?
The MSRP is $159,000 US Dollars, including the Evolution Textile RIP and the Coloring Software.

8. What is the street price?
It is the same.

9. Do you need a coating machine, steamer, washer, calendering machine?
Post-process equipment needs will vary depending on the type of inks and fabrics the customer uses. Steamers, curing/fixing or calendaring units and washers may be needed depending on ink type.

10. Is it recommended, or required, to buy a spare parts kit? Or extra printheads?
Like with any other printer, it is recommended to have some spare parts and consumer parts to avoid any shipping delays for technical services.

PURCHASING

11. Where are demo centers located?
The demo center is in Los Angeles, California, at DigiFab System's corporate headquarters. Call ahead to schedule an appointment.

12. What kinds of leasing or other financing are available?
The customer is free to choose from leasing companies that DigiFab may suggest, or to use his own leasing/financing company.

SET-UP OF THE PRINTER: PRACTICAL CONSIDERATIONS

13. What are the electrical requirements of this printer?

The printer needs Ac200V – 240V – 50/60Hz.
The belt system needs 3phase 240V – 50/60Hz – 9kw installed power.
Working power is about 3Kwh - CE.

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

Proper ventilation and/or air circulation is always recommended. However, exhaust is not required for this printer, unless you plan to cure/heat fix the fabric in the same room. In which case you should use the manufacturers recommended exhaust system.

The StampaJet is designed to work with water-based inks mainly, and not solvent, oil, and UV inks which are more abrasive and require more sophisticated ventilation.

We always recommend to run all printers in a controlled environment, to make sure you work within the recommended temperatures and humidy settings, and to ensure a good air circulation.

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

Temperature range is 20-35 °C/ 68-95 °F.
A humidity range of 35-65 rh is required.

16. What is the connectivity? Network, SCSI, FireWire, USB, Ethernet, or other?

USB 2.0 on RIP Server, and Network for workstations that would work in the Local Area Network or remotely through a VPN connection. The RIP Layout and Print software can be installed in as many workstations as the customer need at no extra cost.

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

Width	Depth	Height	Weight
10.5 ft (3.2 Mt)	5.25 ft (1.6 Mt)	4.92 ft (1.5 Mt)	2,200 lb (1000 Kg)

18. How many boxes arrive?

The printer arrives in one crate, assembled, and ready to be unloaded, connected to power, and to fill up the inks.

19. Realistically, what expenses must you incur for the installation, such as a fork-lift truck or crane to lift the printer off the truck?

Either a forklift or crane will be OK to unload the printer from the crate. Proper power supply, water supply, and air supply are required. These last two are normally inexpensive and already existent in most sites.

INSTALLATION OF THE PRINTER

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

2 people should be used to lift the box pieces safely.

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

One forklift/crane

22. Does the printer come in one piece? Is the printer already put together?

Yes, it is already assembled and ready to add ink and print

23. Is installation included in the purchase price?

Installation is additional.

TECH SUPPORT & WARRANTY

24. Do the tech support people understand fabrics and textiles?
Yes, all tech support personnel at DigiFab Systems are trained to understand textiles, digital textile printing, and normally have previous experience in the field.

25. What is the native language of the tech support person?
In the U.S.A. English is the technicians' first language, and sometimes Spanish the second. But it may vary by country or region.

CONSTRUCTION: AESTHETICS

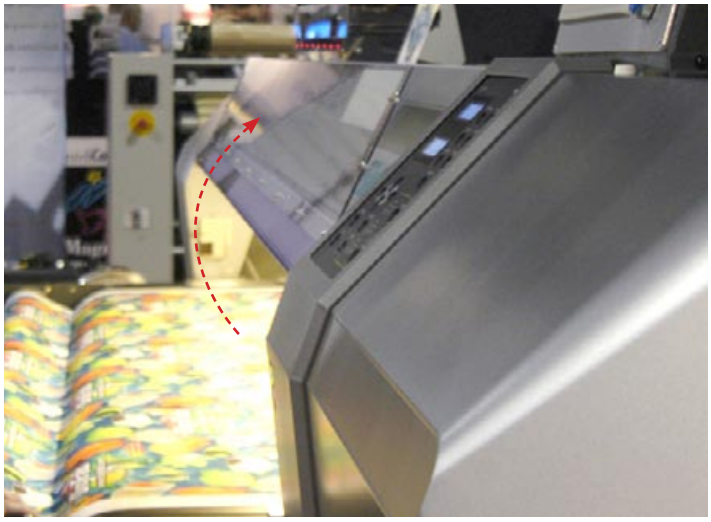
26. Can you easily tell which is the "front" and which is the "back"?
The front is where the control panel is located.

CONSTRUCTION: BUILD QUALITY

27. What is the solid-ness of the construction of the outer body? Is it plastic? Metal? Heavy gauge?
The structure is solid. There is not the smallest vibration while printing.

28. Is there a front hood and also a back hood?
There is only a front hood.

29. Does the front hood lift up high enough to allow full access?
The hood folds all the way up. However, the operator is not expected to stick his hand on the printing area. The cleaning is done at the right, and there is a specific hood for the cleaning area.



The Plexiglas front hood opens all the way up.

30. The front hood, is it strong, or cheap plastic?
It is made of Plexiglas.

31. What about the back hood?
There is no back hood.

32. What is the solid-ness of the inner parts? Plastic, metal?
Although these first notes were taken at SGIA 08, what little could be seen from the outside looked very solid and well built.

The best way to answer this question is to visit the manufacturer´s plant, which FLAAR has done while evaluating printers from Gandinnovations, Durst, Mutoh, IP&I, Mimaki, Dilli/DGI, VUTEk, Teckwin, Yuhan Kimberly, etc.

33. Does the printer wobble back and forth when printing?
No vibration at all.

34. How many wheels?
Four.

35. How many leveling devices?
Four. Although it is ideal to level a printer, the StampaJet can work relatively unleveled.

36. Is the wheel and leveling device the same unit, or separate?
Wheels and leveling supports are separate units.

FEATURES: MEDIA: Heaters

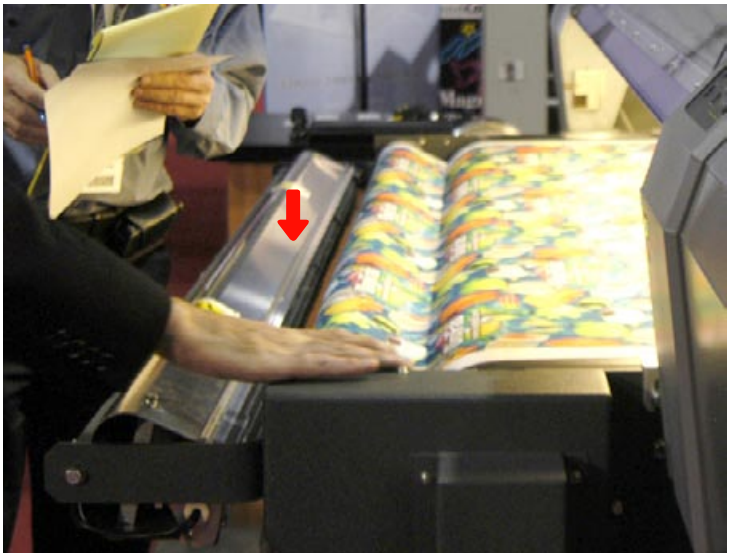
37. How many heaters are used?
There is one large heater unit in the front. An optional 2nd heating unit can be added if necessary.

38. What is the purpose of the heater(s)? To dry the ink, or to fix the ink?
Rather than to fix the ink, the heater dries it so you don´t get ink migration to the back side of the media while rolled up by the take-up unit.

39. Are the heaters before printing, during printing or after printing?
After printing. There is another drying unit below, but this is to dry the transport belt after it has been washed.

40. If there is more than one heater, can they be operated independently?
Yes they are operated independently.

41. Is there an air blower as dryer? Where is it situated?
In the same unit.



The drying unit is at the front, so that the fabric is exposed to the heat after being printed on.

42. Do you need to buy a separate additional heater?
If the ink and process the customer uses require it, we offer the option of installing a second heating unit as an integral part of the printer.

STRUCTURE OF THE PRINTER: Media Transport Mechanism & Media Path

43. Was this printer made originally as a textile ink printer, or is it retrofitted for textiles? If retrofitted, what was the original brand or model?
The StampaJet is originally made as a textile printer. However, the outer shroud is from Mimaki.

44. Is there a moving transport belt or a stationary platen?
Yes there is a moving transport belt.

45. Are there edge guards at each side (end) of the platen? At left, or at right, or both?
Edge guards are not necessary since the fabric adheres to the transport belt.

STRUCTURE OF THE PRINTER: Transport Belt

46. Describe the transport belt?
The transport belt follows a triangular path. It was designed with high precision tracking. It is easy to adjust.

47. Is it a sticky belt? Or with vacuum table underneath?
It uses glue so that the fabric clings to the surface; it feels tacky. After the belt has been in contact with the fabric it may have fluff and specks in it that can accumulate. That´s why the belt is washed and dried. The washing and drying is done in the lower area.

There is no vacuum system.

48. Size, does it stick out?
The belt covers the full printable area. It sticks out about 20cm from the body of the printer.

49. Why did your designers select this structure for the transport belt?
When designing the transport belt moving system, they determined that this is a more compact design that fits in smaller offices. Plus it has a more efficient way of cleaning the belt.

50. How well does this belt hold up to heavy use? Does it skew?
It could skew, but you can adjust it with four adjustment points.

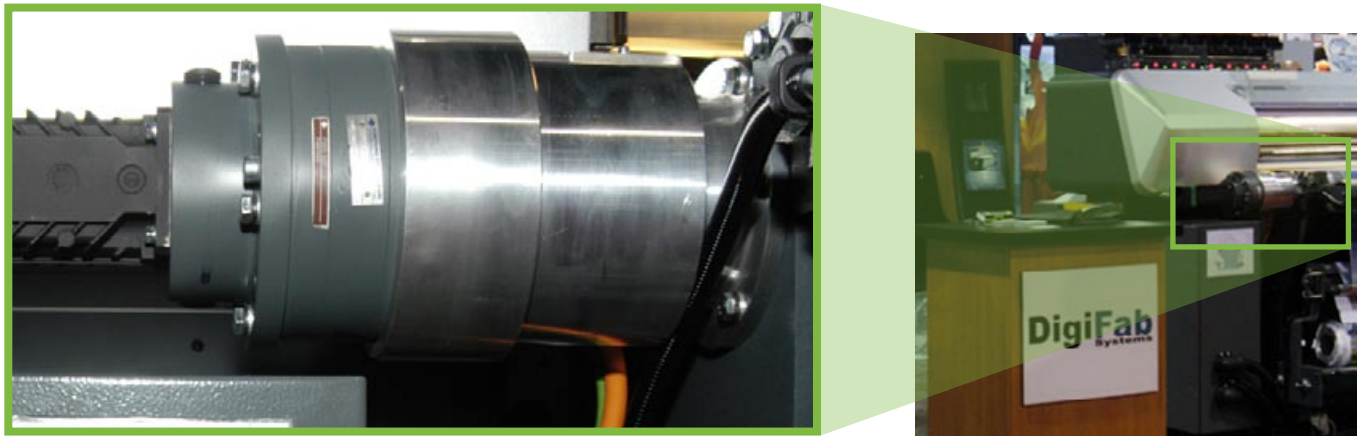
You can check this yourself to some degree by looking at the transport belt from either side. Have the lighting shine on the belt so that you can see the horizontal sections. What you want to see is whether the woven aspect of the belt remains straight, or whether it has shifted from stress and strain.

51. How many rollers control the belt: is the path of the belt horizontal, or triangular?
The path of the belt is triangular, because it goes diagonally downwards to the washing unit.

You should expect at least one drive roller and one driven roller, one at the front the other at the back. In between is a rectangular horizontal vacuum bed, essentially the same kind of bed you get on a dedicated flatbed printer.

The IP&I Revo has three rollers; the IP&I Cube260uv has four rollers that control the transport belt. This adjustment and alignment control system on the IP&I Cube UV printers is the most sophisticated I have yet noticed.

52. Which is the drive roller for the transport belt (where is the motor and what kind of motor turns the transport belt?
You can see the motor of the drive roller at the left front.



The drive motor -that controls the movement of the transport belt- is located at the front left.

FEATURES: MEDIA: Roll-to-roll feeding

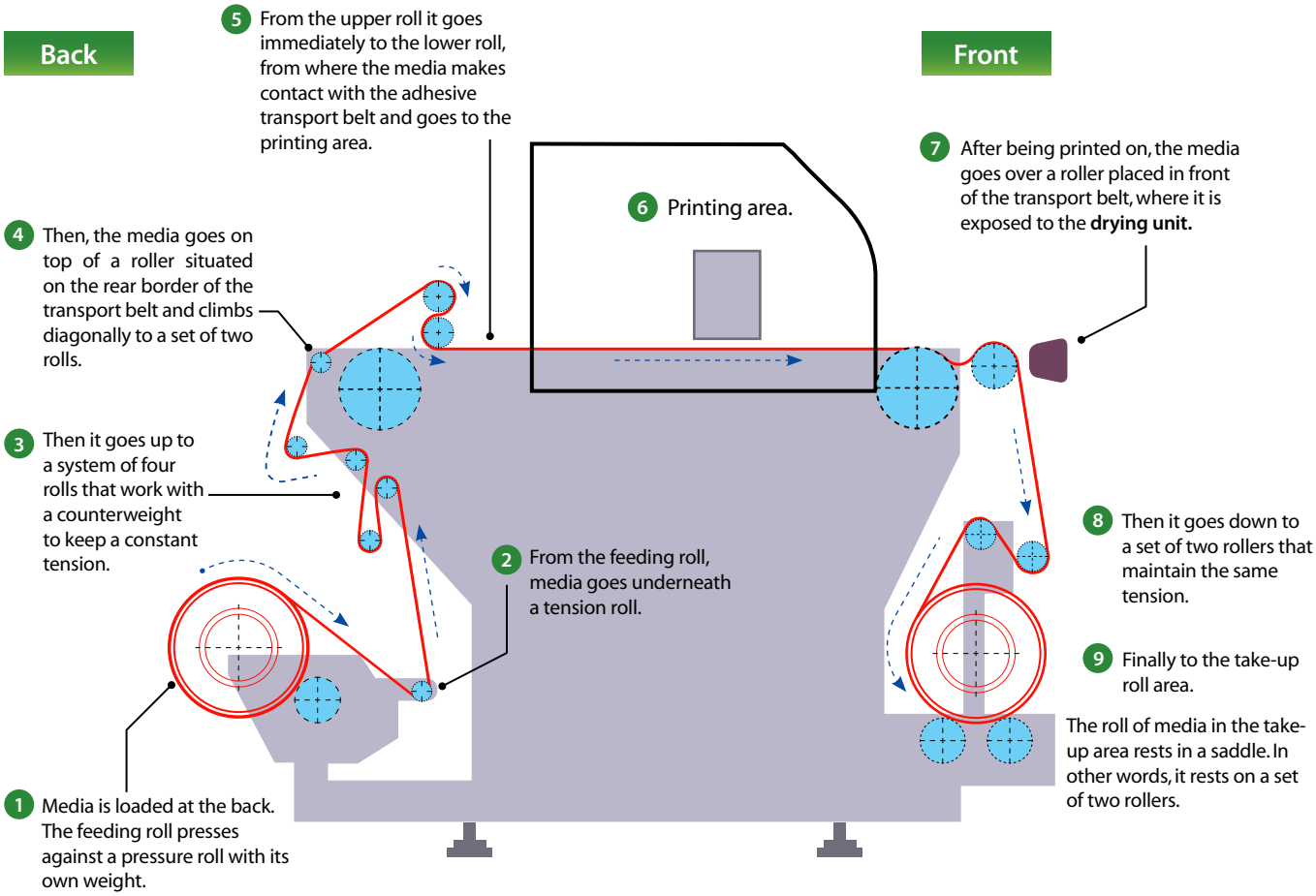
53. How is roll media fed? Pinch roller against grit roller?
There are no pinch rollers. The media is moved by the glue system of the transport belt.

54. Does the feeder roller have an air core?
No. The feeder roller has an independent motor.

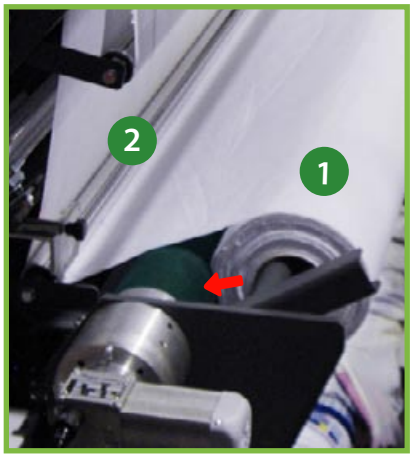
55. At the front, is there an extra roller bar(s) near the platen or transport belt? Is it a bar to roll under the media, or over the media, or are there both (in addition to pinch roller/grit roller arrangement).
At the front end of the transport belt there is a roller that receives the fabric and rolls it downwards to be exposed to the drying unit. Also, at the front there is a system of two rolls that maintain a constant tension.

56. Describe the overall path of the media through the system?

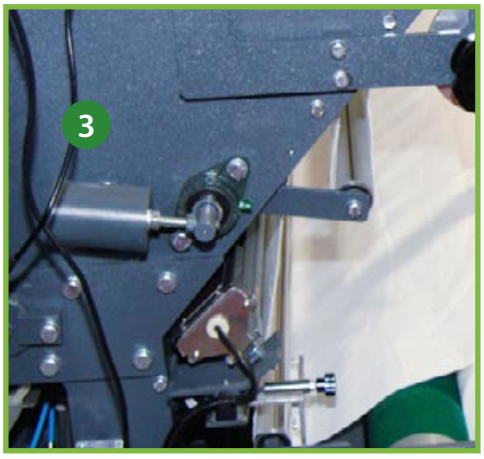
You can see the media path if you follow the steps 1 through 9 clockwise from the lower left area on the following diagram.



As you can read and see in this diagram, the media path is a complex system that takes advantage of physics and hi-tech electronics.



The feeding roll uses its own weight to press against the green roller that rotates to move it. You can see the motor that controls the green roller at the bottom of this photo.



This is the counterweight system that keeps a constant tension.

After being printed on, the fabric is exposed to the drying unit. This ensures your material won´t have ink migration while being collected by the take-up unit.

57. Does the roll-fed material feed evenly?
It has a centering unit in the feed roller. There is no problem in this aspect.

58. What about the take-up reel? Does it work unattended? Does media skew when it is wound up?
The take-up system works unattended.

59. Does the take-up spindle have an air-core?
No, it doesn't work with air. The roll has weights inside.

60. Does material roll up evenly on the take-up reel?
Not perfectly, but even enough.

Neither the feeding roll nor the take-up system work with an air core system. As you can see, the feeding spindle moves the roll diagonally downwards as the media is being fed into the system. The green roll rotates the feeding roll.

OPERATING THE PRINTER

61. Can you manage print jobs via the Internet with your printer?
You can print via network. The software is designed to support print jobs sent from a local network using hot folders and printing through VPN (Virtual Private Network) online connections.

62. Which materials are pre-established in the software, or do you have to create the settings for each class of material yourself?
There are no pre-established settings for specific materials, but you can set the printer according to the material, color settings, etc.

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

64. How many operators or operator assistants does this printer require?
One is more than enough. In fact, there have been situations where one person is operating three printers at a time.

65. What can you control as operator?
After loading the media, the operator just needs to check everything is running ok.

Of course, the cleaning procedures are always a task of the operator.

66. What is the level of ease of use? Can anyone use this printer or do they have to be trained and certified?
The same skill level required to operate any digital printer.

67. Can you do unattended printing? For how long? How about overnight?
Yes you can. Just check for enough ink, media. The machine has built in alarms that will stop the printer due to media jams, media feeding unwinding and rewinding problems, if you run out of media or ink depending on the ink delivery system used.


The main control area has both physical buttons and touch screen system.

68. Where does the operator stand or sit?
Main control area is at the right, but the operator doesn't have to be there all the time.

69. What aspects of the printer can you operate from behind (the loading area)?
Just loading the roll of fabric.

70. What controls are at the back of the printer?
None, except for an emergency stop button.


There are no controls at the back, except for an emergency stop button.

SAFETY & HEALTH CONSIDERATIONS

71. How many emergency stop buttons are there, and where are they located?
One at the front and one at the back. Remember that emergency stop buttons are not pause systems. Once you press them, you will need to start your print job from the beginning. But the printer does have a system to pause and continue printing where you stopped.

72. Is there auto-shut down? If so, what triggers it?
It won't totally shut down, but if you run out of ink or material, or if the printer detects any electrical or physical problem, it will stop printing.

73. Is there auto-shut down if the operator sticks their hand into the system while it's operating?
The printhead carriage has a head strike/paper jam sensor, and it will stop if the carriage hits one's hand.

74. How much odor is emitted by the ink or heat sublimation process? How much subsequent outgassing is there, and for how long does the stuff smell?
This textile printer doesn't emit odor, if compared to a solvent printer. It uses non-flamable eco-friendly water-based inks.

75. Is the machine enclosed, or exposed?
The machine is enclosed, but the feeding system and the take-up system are exposed.

76. What system of ventilation or exhaust system is built into the printer? Or if not required, what would common sense dictate? Is it adequate to clear the work area of gasses and fumes?
No exhaust system. If you use the heaters at high temperature, you may have some steam as you dry the fabric.

77. Do the printer specs list the noise level?
Yes. The brochure states <50 db.

78. What moving parts might hit a person if they are standing near the printer?
None. They are all enclosed inside the printer.

79. Are any other safety or health issues involved? Does the operator need to be concerned with any other safety precautions?
"No. None that I know".

Although the printer is totally enclosed, it does not need an exhaust system. As you can see, the whole roll-to-roll mechanism is exposed.

80. Is the Operator Manual so poorly translated that you might make a mistake; a mistake that could be damaging to your health, or otherwise dangerous for your printshop?
DigiFab is a company founded in the United States. The manuals and all literature are originally written by English native speakers.

81. How easy is it to obtain the MSDS of the ink?
It depends on the inks you but, but you can ask DigiFab for a data sheet and you will have it relatively easy. If you visit DigiFab´s web site you can download brochures in .PDF format of the choices of ink.

PRINTHEAD TECHNOLOGY

82. What is the brand of the printhead, and model?
Epson heads.

83. Is the brand and model of printhead clearly identified in the published specifications?
The brochure does not provide the brand nor the model.

84. What other printers use the identical printheads or a model very similar?
Epson 9800, Mimaki JV5 and JV33.

85. Please explain why your printhead technology (piezo for Epson, Mimaki, Mutoh, Roland; thermal for Canon, ColorSpan, Encad, HP) is an advantage and why the opposing printhead technology is not necessarily ideal? But if the other technology is so bad in your opinion, then why is it able to perform so many things that yours is not able to perform?
Piezo printheads are generally more expensive than thermal, but the first allow a wider variety of inks.

86. What is the width of the printing pass of this printheads?
This will depend on the number of passes you select. The less passes, the bigger the width of each pass. At 12 passes the width was about 1.5 cms.

PRINTHEAD DPI & FEATURES

87. How many printheads are used?
Four.

88. How many nozzles per printhead?
1440 nozzles per head.

89. Can a sensor(s) detect clogged nozzles and can software provide backup nozzles to cover that missing area on the next pass?
Yes. There is an automatic detection of clogged nozzles and automatic cleaning.

90. How many printheads per color?
8 colors per head. 4 printheads.

91. Can your printhead technology achieve a solid black black?
Yes. Besides, the RIP controls bleeding and pooling problems. The RIP has an advanced ink control limiting saturation.

When we visited Gandinnovations demo room in Toronto, the AquaJet textile printer produced impressively bright and beautiful colors. However, there were some dark areas where too much ink had accumulated creating a "pool" that almost totally blurred the details of the dark areas of the photo.

92. Is their variable droplet size capability?
Yes. There is variable and non-variable capability, depending on the settings you select.

93. Is printing bi-directional or uni-directional? What are the different results in speed; in quality?
This depends on the customer. You have the option to select bi-directional or uni-directional. Realize that on a textile printer, normally you won't tell the difference because of the texture of your media.

94. How many passes can this printer achieve?
3 to 32. At SGIA 08 the printer was set to print at 6 passes.

You can set the system for both bi-directional or uni-directional printing.

95. How many print modes are there?
540 - 720 - 900 - 1080 - 1440 dpi working in combinations totaling at least 8 printing modes.

Thanks to the 4-staggered printhead setup, even when printing at hi-pass, the printer is physically printing at low-pass, dividing work among the heads to gain speed.

96. Which materials can be printed fast at 2-pass or 4-pass modes?
All materials can be printed at 2 pass or 4 pass modes.

97. Is the laydown sequence of the ink the same in bi-directional mode as it is in uni-directional mode?
With a 4-color configuration yes. If you choose an 8-color configuration, the sequence will be inverse.

PRINTHEAD LIFE EXPECTANCY

98. How often can you expect head strikes? What causes them? Who will replace the printheads and at whose cost?
Head strikes are not as common as on other textile printers due the newer belt and feeding system and their design. The belt has a heat activated glue, a washing unit, and an innovative feeding system and rollers.

• A head strikes is 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 printhead. 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 thin materials may be raised too high

• 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 adhesive pulls off the material the adhesive may get stuck on the nozzle plate of the head

• For a textile printer, an additional cause of printhead failure is the fuzz of the threads which may stick up and rub the nozzle plate

• Some material is like sandpaper to the nozzle plate, some papers, and metal (and the metal edge is another danger to the printhead nozzle plate)

PRINTHEAD POSITIONING

99. Are printheads arranged in a cluster, or in an array?
The printer has 4 staggered printheads.

100. Are the printheads at an angle to the movement of the carriage, or at 90-degrees?
Printheads lay flat and are not in an angle.

101. How complex is it to align the printheads?
It is the same as any other digital printer of its type, which uses similar Epson printhead technology.

102. Do you need to tell the printer where to start printing?
You don't need to tell the printer where to start, it automatically reads the width of the fabric, and its edges. You also have the choice to tell the printer to start printing somewhere else, either in the printer itself or via software.

CLEANING & MAINTENANCE

103. How is head cleaning accomplished? Spray, vacuum, suck, manual, other?
Head cleaning is automatically done, with the same methods used by other Epson printheads; it uses a capping station and pump to suck the ink from the head.

104. How many levels (strengths) of printhead cleaning (purging and/or sucking) can be accomplished via the firmware (software)?
3 levels of cleaning: soft, medium and strong.

105. Can you purge an individual printhead, or do you need to purge all at once?
You can purge by groups of 2 printheads at a time (the first 2, and the last 2 together), or all 4 together.

106. Where is the service station?
It is located to the right side.

107. Is the service area the same as the parking area?
Both sides, the left side is manual service and to the right is automatic.

108. Is there a capping station?
Yes, four to the right side.

109. What is the most delicate, or complex, or time-consuming cleaning or maintenance chore?
The cleaning of the printheads is automatic.

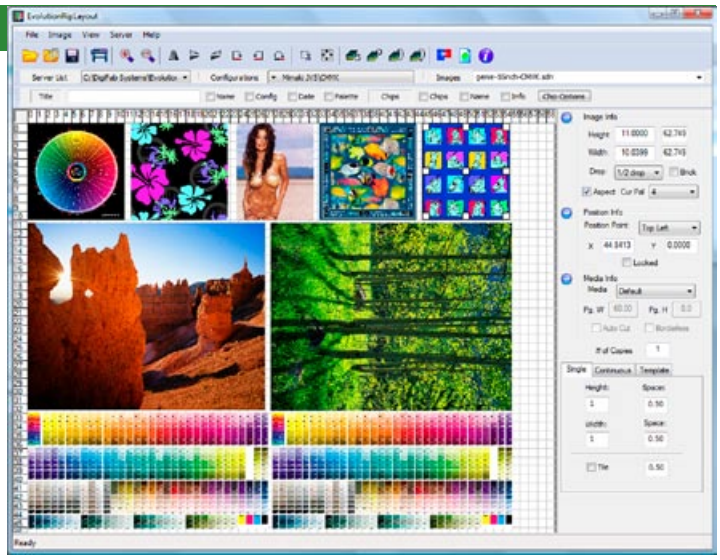
CLEANING & MAINTENANCE: ROUTINE MAINTENANCE

110. What daily maintenance is required at start up in the morning?
No specific requirements, other than to print a test pattern to check nozzle conditions.

111. What daily maintenance is required at night?
No specific requirement.

112. What self-maintenance does the printer do on its own?
The printer has an automatic printhead cleaning system.

RIP SOFTWARE: FEATURES



113. Is a RIP included in the original price?
Yes, it is included Evolution RIP, from DigiFab.

114. Is this a full-featured RIP or only a lite RIP?
There are two versions Textile and Textile Plus.

115. Is your printer and/or RIP Pantone certified?
No, but the RIP can read Pantone codes and comes with his own color library.

116. 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?
It's customers choice, you have both options.

117. What other printers can this same RIP software? Or is this RIP restricted solely to this one printer?
Most major large format printers like Encad, Epson, HP, Mimaki, Roland, Artistri, Mutoh, Dupont and Stork.

118. Can this RIP be upgraded to run my next printer? If not, why not?
Yes, via software key.

119. Can your printer function without a RIP with a Macintosh or only with a PC? In other words, are your drivers for PC only or for Mac and PC? Do you get full functionality with a Mac driver compared to a PC driver?
The only one that would work without is Epson.

120. Although the world tends to use PCs, is your printer equally Mac friendly?
Just PC.

INK

121. How many different kinds of ink are available?
Acid, Reactive, Disperse/Sublimation, Pigment, and Dye.

122. What company makes the inks? Choices include Yuhan-Kimberly, Ciba, DuPont, Sericol, Sun, Triangle, Inkwin, and many others.
Several companies, including DigiFab, DyStar, Ciba, DuPont, BASF.

123. Does the printer itself have a means to keep track of ink usage? Is this a guestimate, or an actual count of droplets fired?
The printer's software can keep track of ink usage using fairly accurate numbers based on data from the print head manufacturer.

124. How much ink is used to print a square unit?
Depends, cotton uses more, Polyester and silk use less.

125. Where are the printer's ink containers located? Front, back, or sides?
Top Front left side of the printer.

126. How much ink does the ink container in the printer hold?
The printer has 2-liter containers for each color.

127. How is new ink added? Pouring into the on-board container? Switching the container to the new ink container?
It has a bulk system option and cartridges. But people tends to ask for bottles for bulk because of price.

The ink containers are located at the left.

INK: COST

128. Does ink come in cartridges or bulk? How large are the ink containers for replacement ink?
The StampaJet is supplied with a bulk inking system,. The bulk ink containers are 2000 ml in size, and other options are alsoavailable.

129. Do you have to buy an entire box? Or can you buy an individual bottle?
You can buy individual bottles in 2 liters containers.

130. What is the cost per container? What is this cost translated to liters?
Ink prices varies depending on ink type.

131. What is the cost, in ink, per square unit?
Average cost per square foot is $0.14.

132. How many square units of fabric will one liter print?
Approximately 600 yards depending on ink type and printer settings.

INK: COLOR GAMUT

133. How many colors are used in the ink-set being evaluated here?
You can choose a 4-color or an 8-color configuration.

MEDIA: Size

134. What widths can be printed?
The maximum print width is 161cm (63,3").

135. What is the maximum roll diameter?
28 cm (11").

136. What thickness media is accepted?
The heads can be lifted up to 7mm with a kit, the normal thickness used by most digital textile printers is up to 4mm.

137. Can the printer print edge-to-edge?
Yes.

138. Is printhead height adjustment available? Is it manual, automatic, how much?
The brochure states the printer has an automatic printhead level adjustment from the substrate that works in a range of >1 to 7mm.

The maximum roll diameter is 11". The maximum roll length (print width) is 63,3".

IMAGE QUALITY ISSUES

139. How can banding be avoided?
It has an optical sensor for jetting.

MEDIA: what materials

140. Can this printer accept non-coated fabrics?

Yes.

141. Can this printer accept fabrics with no paper backing?

Yes, it is designed to use fabrics with no paper backing. The booklet of samples shows paper-backed and unbacked fabrics.

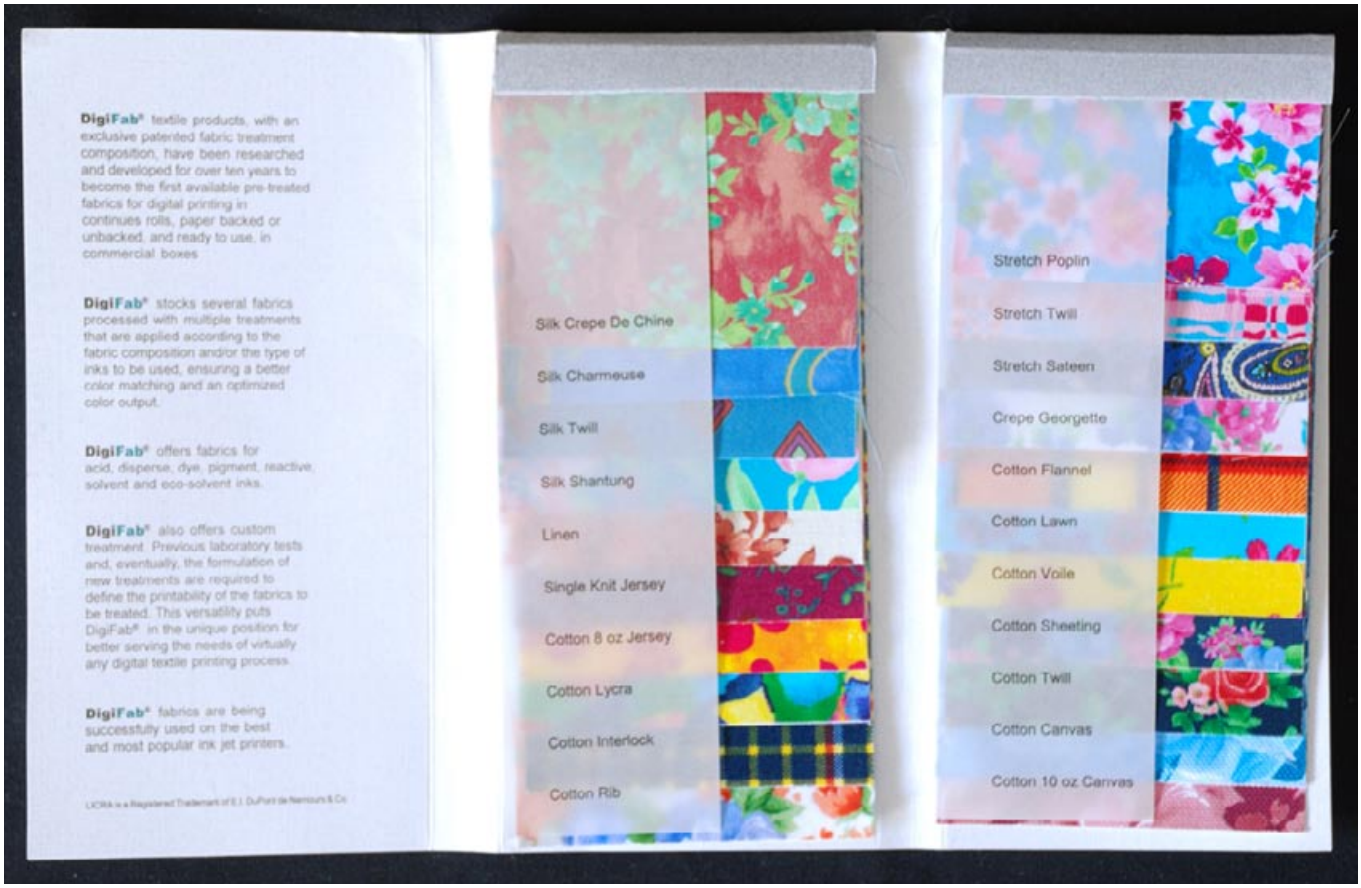
142. What textiles does the manufacturer list?

The booklet of fabric samples lists:

- Silk Crepe de Chine
- Silk Charmeuse
- Silk Twill
- Silk Shantung
- Linen
- Single Knit Jersey
- Cotton 8 oz Jersey
- Cotton Lycra
- Cotton Interlock
- Cotton Rib
- Stretch Poplin
- Stretch Twill
- Stretch Sateen
- Crepe Georgette
- Cotton Flannel
- Cotton Lawn
- Cotton Voile
- Cotton Sheeting
- Cotton Twill
- Cotton Canvas
- Cotton 10 oz Canvas

"You can choose one of our stocked fabrics or we can custom treat your own fabric. You can find silks, cottons, polycottons, nylons, and polyesters among our offered fabrics, that come as wovens or knits, with or without stretch, depending on fabric type".

COMMENT: there is a sample book for Polyester fabrics too. We have all sorts of fabrics in stock or for custom treatment, including Nylon, Polyester, Silks, Cottons, blends, and others. The booklet you show on the report is mainly for natural fibers.



Sample book provided by DigiFab.

143. What textiles can this printer print on perfectly?

Most types of fabrics can be used on this printer (polyester, nylon, cotton, silk, stretch or not). The ones listed on the booklet are just one small selection of natural fibers.

144. What fabrics are best not to try at all?

"All can be used".

145. Is there a trough to catch the ink that goes through the weave of the fabric?

It has an adhesive print blanket that catches excess ink and integrated belt washing unit which cleans excess ink that has come through the fabric on to the belt.

FLAAR thanks Alex Izmirlian of DigiFab Systems, who explained the ins and outs of the StampaJet to complete this report at SGIA 08.

If you need more information about **DigiFab textile printers**, please contact:

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Reality Check

Being a university professor for many years does not mean we know everything. But intellectual curiosity often leads us to enter areas that are new to us. So we do not shirk from entering areas where we are obviously not yet expert. If in your years of wide format printing experience have encountered results different that ours, please let us know at ReaderService@FLAAR.org. We do not mind eating crow, though so far it is primarily a different philosophy we practice, because since we are not dependent on sales commissions we can openly list the glitches and defects of those printers that have an occasional problem.

FLAAR and most universities have corporate sponsors but FLAAR web sites do not accept advertising, so we don't have to kowtow to resellers or manufacturers. We respect their experience and opinion, but we prefer to utilize our own common sense, our in-house experiences, the results from site-visit case studies, and comments from the more than 53,000 of our many readers who have shared their experiences with us via e-mail (the Survey Forms).

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Update Policy

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

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

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

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

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

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

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

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

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

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

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

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

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

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

The user is advised to test products thoroughly before relying on them. We do not have any special means of analyzing chemical contents or flammability of inks, media, or laminates, nor how these need to be controlled by local laws in your community. There may well be hazardous chemicals, or outgassing that we are not aware of. Be aware that some inks have severe health hazards associated with them. Some are hazardous to breathe; others are hazardous if you get them on your skin. For example, some chemicals such as cyclohexanone do not sound like chemicals you want to breathe every day. Be sure to obtain, read, and understand the MSDS sheets for the inks, media, and laminates that you intend to use. Both solvent, eco-solvent, and UV-curable inks are substances whose full range of health and environmental hazards are not yet fully revealed. It is essential you use common sense and in general be realistic about the hazards involved, especially those which are not listed or which have not yet been described. FLAAR is not able to list all hazards since we are not necessarily aware of the chemical components of the products we discuss. Plus, there is no way to know if all MSDS sheets are honest to begin with! Our reports are on usability, not on health hazards.

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

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

Results you see at trade shows may not be realistic

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

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

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

Trade show examples tend to be on the absolutely best media. When you attempt to save money and use economy media you will quickly notice that you do not get anywhere near the same results as you saw in the manufacturer's trade show booth, or pictured in their glossy advertisement. Five years ago we noticed Epson was laminating prints to show glossy output because their pigmented inks could not print on actual glossy media. The same equipment, inks, media, and software may not work as well in your facility as we, or you, see it at a trade show. All the more reason to test before you buy; and keep testing before you make your final payment. Your ultimate protection is to use a gold American Express credit card so you can have leverage when you ask for your money back if the product fails.

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

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

Factors influencing output

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

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

ware and software. This is why Nicholas Hellmuth is considered the "Johnny Appleseed" of wide format inkjet printers.

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

For example, you will most likely need a color management system which implies color measurement tools and software. To handle ICC color profiles, you may need ICC color profile generation software and a spectrophotometer since often the stock pre-packaged ICC color profiles which come with the ink, media, printers and/or RIPs may not work in your situation. Not all RIPs handle color management equally, or may work better for some printer-ink-media combinations than for others. Please be aware that our comments or evaluations on any after-market ink would need the end-user to use customized ICC profiles (and not merely generic profiles).

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Availability of spare parts may be a significant issue

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

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

Lack of Tech Support Personnel is increasing

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

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

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

Counterfeit parts are a problem with many printers made in China

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

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

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

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

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

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

Be sure to check all FLAAR resources

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

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

Acknowledgements

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

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

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

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

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

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

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

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

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

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

We thank MacDermid ColorSpan (now part of HP), Hewlett-Packard, Parrot Digigraphic, Color DNA, Canon, Gandinnovations, and other companies for providing funding for technology training for the FLAAR staff and our colleagues at Bowling Green State University in past years and for funds to allow us to attend all major international trade shows, which are ideal locations for us to gather information. We thank Caldera, EskoArtwork, EFI Rastek, EFI and VUTEk, OTF (Obeikan), Drytac DigiFab, Barbieri electronic, Seiko II, Parrot Digigraphic, AT Inks, Sepiax inks, Sam-Ink, Dilli, Grapo, and WP Digital for providing funds so that we can make more of our publications free to end-users. During 2000-2001 we had grants to cover all the costs of our publications, and all FLAAR Reports were free in those early years. As that early grant naturally expired after a few years, we had to begin charging for some of our reports to cover costs. Now (in 2010), we are seeking corporate sponsorship so we can gradually make another 20% of our publications free to our readers.

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

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

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

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

from HP about every two years. We are under NDA as to the subjects discussed but it is important that we be open where we have visited. Mimaki Europe has had FLAAR as their guest in Europe to introduce their flatbed UV printer, as have other UV-curable manufacturers, again, under NDA as to the details since often we are present at meetings where unreleased products are discussed. Xaar has hosted an informative visit to their world headquarters in the UK. You don't get this level of access from a trade magazine writer, and I can assure you, we are provided much more detailed information and documentation in our visits than would be provided to a magazine author or editor. Companies have learned that it's a lot better to let us know up front and in advance the issues and glitches with their printers, since they now know we will find out sooner or later on our own. They actually tell us they realize we will find out on our own anyway.

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

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

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

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

We really liked some of the results whereas some of the other products were a bit disappointing. Providing samples does not influence the evaluations because the evaluators are students, professors, and staff of Bowling Green State University. These personnel are not hired by any inkjet printer company; they were universities employees (as was also true for Nicholas Hellmuth). The testing person for the HP ColorPro (desktop printer) said he frankly preferred his Epson printer. When we saw the rest results we did not include this Hewelett-Packard ColorPro printer on our list of recommended printers, but we love our HP DesignJet 5000ps so much we now have two of them, one at each university.

Sometimes we hear horror stories about a printer. The only way we can tell whether this is the fault of the printer design, or lack of training of the operator, is to have the printer ourselves in-house. Of course some printer manufacturers don't understand the reasons we need to have each make and model; they are used to loaning their demo units for a week or so. That is obviously inadequate for a serious review.

Some of the media provided to us failed miserably. Three printers failed to meet common sense usability and printability standards as well (HP 1055, one older desktop model (HP Color Pro GA), and one Epson). Yet we know other users who had better results; maybe ours came down the assembly line on a Monday or Friday afternoon, when workers were not attentive. One costly color management software package was judged "incapable" by two reviewers (one from the university; second was an outside user who had made the mistake of buying this package).

So it's obvious that providing products or even a grant is no shield from having your products fail a FLAAR evaluation. The reason is clear: the end user is our judge. The entire FLAAR service program is to assist the people who need to use digital imaging hardware and software. If a product functions we find out and promulgate the good news. If a product is a failure, or more likely, needs some improvement in the next generation, we let people know. If a product is hyped by what an informed user would recognize as potentially false and misleading nonsense, then we point out the pathetic discrepancies very clearly.

This is what you should expect from an institute which is headed by a professor.
Actually, most of our reviews are based on comments by end users. We use their tips to check out pros and cons of virtually every product we discuss. You can't fool a print shop owner whose printer simply fails to function as advertised. And equally, a sign shop owner who earns a million dollars a year from a single printer brand makes an impact on us as well. We have multiple owners of ColorSpan printers tell us that this printer is their real money earner for example. We know other print shops where their primarily income is from Encad printers. Kinkos has settled on the HP 5000 as its main money maker production machine, and so on.

Yet we have documentation of several print shop companies whose business was ruined by specific brands that failed repeatedly. It is noteworthy that it is always the same brand or printer at both locations: one due to banding and printheads then simply no longer printing one color; the other brand due to pokiness of the printer simply not being competitively fast enough. Same with RIPs, we have consistent statements of people using one RIP, and only realizing how weak it was when they tried another brand which they found substantially better. Thus we note that companies which experiment with more than one brand of product tend to realize more quickly which brand is best. This is where FLAAR is in an ideal situation: we have nine RIPs and 25 printers. Hence it is logical that we have figured out which are best for our situation.

Grant funding, sponsorship, demonstration equipment, and training are supplied from all sides of the spectrum of printer equipment and software engineering companies. Thus, there is no incentive to favor one faction over another. We receive support from three manufacturers of thermal printheads (Canon, ColorSpan and HP) and also have multiple printers from three manufacturers of piezo printers (Epson, Seiko, Mutoh, and Mimaki). This is because piezo has definite advantage for some applications; thermal printheads have advantages

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

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

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

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

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

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

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

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

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

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

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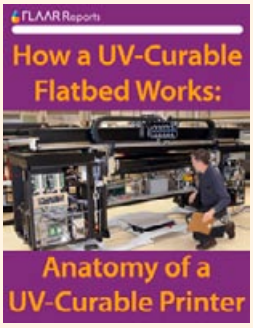

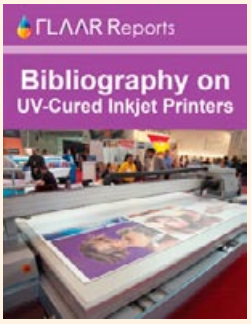

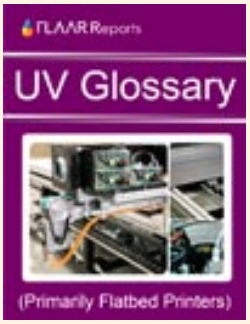

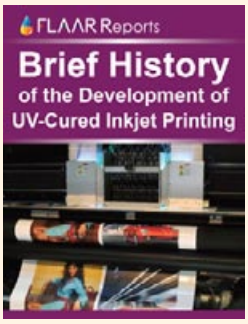

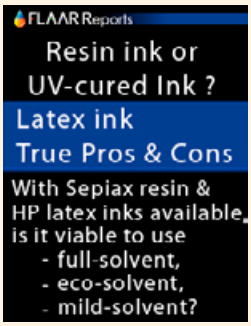

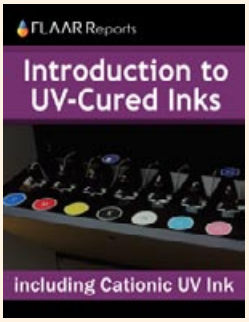

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