FLAAR Reports

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Wide-Format Dye Sublimation Printer for Textiles

Gandinnovations Jeti 3324 AquaJet RTR

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Contents

THE BASICS

1. Brand name, model?
Gandinnovations Jeti 3324 AquaJet RTR

2. What is the nature of the company behind the brand name? Is this company the manufacturer, distributor, or rebranding?
Gandinnovations is the fastest-growing printer manufacturer in America and a heavy-weight competitor in the world market. Gandinnovations makes its own printers, indeed they manufacture even their own frames. Most other printer companies buy their frames and add the electronics, ink system, etc.

Gandinnovations does not offer their printers under other names.

The AquaJet is one of the 7 printers exhibited in Gandinnovations demo room in Mississagua, Toronto, Canada. This machine is meant to print on a wide variety of flexible media, at a high speed.

3. Does the machine manufacturer produces inks for textiles?
Up to recently Gandinnovations had a staff devoted to developing inks, stationed in part in the Long Island, NY area. Evidently this ink project was sold to another company during 2008.

4. Does the machine manufacturer also make textiles to print on with this machine?
No. Gandinnovations is a printer company; they do not manufacturer fabrics; there are plenty of materials you can obtain on the open market to use in this printer.

5. What other printers are the same or similar chassis from this manufacturer or distributor?
Gandinnovations specializes in solvent and UV printers. This is the second dye-sublimation machine produced by this Canadian-based company. The first model required a separate calendering machine. With the AquaJet the sublimation process takes place inside the printer.

6. What other printers are the same or similar chassis?
Gandinnovations began manufacturing roll-to-roll solvent machines years ago. Then UV technology appeared and this Canadian company began its production of roll-to-roll UV printers.

So, the feeding mechanism in all roll-to-roll machines from Gandinnovations is very similar.

7. When and where was this model first introduced?
We first saw this textile machine at ISA 08, Orlando, Florida.

8. Is this printer mature technology or still in alpha-stage or beta-stage?
At ITMA Gandinnovations exhibited an alpha version. At Munich 2007, Viscom Europe, and Istambul 2007 they exhibited a beta version.

This printer is out of beta stage but is still having features added or improved, such as the improved ventilation or exhaust processing system for the steam. Upgrades are still being done with different fabrics; this means there are not drastic changes.

9. How does this model compare with comparable previous printers?
Previous AquaJet models used oil-based inks. Now they are water-based with infra red.

10. List price?
€ 245,000, which means under $400,000

11. What comes with the printer: stand, network connection already installed, take-up reel?
Other than outside air pressure and electricity, everything is included. Media loader comes too.

12. Does a complete set of full-sized ink cartridges come with the new printer, or merely a "starter set" that is not as full as a regular set?
The printer comes with 5 liters of ink per color and 16 liters of a cleaner liquid.

13. Do you need a coating machine, steamer, washer, calendering machine?
No post processing elsewhere is needed, since actual system does sublimation on-board.

PURCHASING

14. Are the dealers a national (most companies) or regional (Roland allows a dealer to operate only within a limited regional area)? Do I have any choice in dealers? (with some printers, choosing a dealer is as important as the choice of printer brand; end users repeatedly suggest that choosing a dealer is crucial to the success, or failure, of some brands of printers).

Gandinnovations have national dealers in an international sense. A few countries have independent dealers.

Some of their printers, such as the 3300 solvent ink printer, are distributed by Oce in some countries such as Canada, France, and others. In Canada you can also buy direct from the factory.

SET-UP OF THE PRINTER: PRACTICAL CONSIDERATIONS

The spec sheet states that the printer requires 230V, 3 Phase 50/60 Hz. A site prep guide is sent to you to check whether you fulfill all of the requirements to install the printer in your facilities.

15. What is the delivery time, between the time I order the printer and it is delivered?

Four weeks.

16. What are the electrical requirements of this printer?

Three Phase hookup
Supply Voltage: 400Y/230 VAC (± 5%) 4 wire plus ground (3 phases, 1 neutral, 1 ground)
Phase to Ground Measurement = 230VAC (± 5%); Phase to Neutral = 230VAC (± 5%)
Phase to Phase = 400VAC (± 5%)
Line Frequency: 50/60Hz
Amperage: 35A (25KVA)

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

There is an industrial strength exhaust unit found at the front right side of the printer. This unit removes vapors, most odors, and aqueous moisture that collects in the Infrared Heating Unit.

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

The spec sheet recommends an enclosed dust free room with ambient temperatures ranging from 20ºC - 23ºC (68ºF - 73ºF). A relative humidity of 40% to 55% to operate at optimum level.

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

Network connectivity is described in the Operator´s Manual as follows: 100 (minimum) or 1000 (recommended) base T switched hub with connectivity to the RIP station, Jeti printer and the client workstation.

The printer is connected to an exhaust unit through a duct to get rid of aqueous vapor oil and debris.

20. What air pressure is required to be provided to the printer? Is this for a vacuum table, or other purposes (such as ventilation)?

A compressed air line installed up to the machine is required.
Compressed air supply will need 5 cfm peak @ 100-150 psi

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

You will need a space 140 x 242 inches (3.57 x 6.15 meters). When you are planning where to place your Jeti AquaJet, remember that the cutting system and take-up roller are attached but are out in front of the main body of the printer.

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

	Height	Width	Length	Weight
Uncrated	70 in (1.8 mt)	72 in (1.8 m)	245 in (6.2 m)	5000 lbs (2600 Kg)
Crated	81 in (2.1 m)	52 in (1.3 m)	230 in (5.84 m)	7420 lb (3244 Kg)

The machine has a maximum height of 85 in (2.16 m). This is because you need extra space to open the carriage hood, which opens upward.

23. 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 machine comes in one piece, but the take-up system comes in a separate crate. It wouldn´t be easy to handle the printer out of the shipping crate if the take-up system came already assembled to the printer.

24. How many boxes arrive?

3 crates

- Printer
- Take Up System
- Extraction Unit

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

The Jeti AquaJet 3324 is an industrial-size printer. The crate should be picked up using a fork-lift truck, with a lifting capacity of at least 5 tons (11,000 lbs) no shorter than 96" (2.5 m) in length. no shorter than 96" (2.5 m) in length.

The fact that there is some assembly work is not bad if you realize that otherwise the printer wouldn´t fit through any normal industrial entrance door.

INSTALLATION OF THE PRINTER

26. Does the printer come in one piece? Is the printer already put together?
Everything is already put together except for the take-up system and the exhaust unit.


Rewind unit and exhaust unit come in separate crates.

27. Is installation included in the purchase price?
Yes. Installation is included in purchase price.

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

- 1 day to install
- 2-3 days or training, depends on experience.

The company can start producing in the first month.

INSTALLATION OF THE PRINTER: INSTRUCTIONS & MANUALS

29. How many manuals are available?
You get a useful 255 page Operator's Manual.

30. Which manuals are hard-copy? Which manuals are only on CD?
The operator's manual is available on a CD and also as hard copy in a binder.

31. What is the rating of usefulness of the User's Manual and other associated materials?
The Operator's Manual is filled with useful information.

32. What schematics does the printer literature provide?
The manual has basic schematics of the printer.

33. What is the native language of these guides? Is the translation acceptable?
The text is written in native English and is fully understandable.

INSTALLATION OF THE PRINTER: TRAINING

34. What training is included with the purchase?
Yes. Training lasts 2 to 3 days.

35. Is training included in the purchase price? If so, what kind of training is offered?
Yes it is included. You get a crew for installation and set-up. Three techs for installation. Then one tech person for training.

36. Is training necessary? Is classroom training available?
Yes it is necessary. At Gandinnovations demo-room, the majority of operators were engineers. This is a very user friendly printer, but the operator must be certified by Gandinnovations.

37. Is factory training available?
Yes, it is an option, but usually the local Gandinnovations tech person can do it.

38. What about follow-up training after you have had the printer a month and know enough to ask better questions?
Follow-up assistance would be over the phone. You can dial 1-866-500-JETI(5384) to clarify doubts with a technical customer service representative.

TECH SUPPORT & WARRANTY

39. What is the original warranty period?
1 year. This is the usual warranty period with most companies.

40. How would you compare reliability and down time with competing brands of printers?
Some companies cover it all, some others cover it all except print heads. Other warranties cover printheads only during a 6 month period.

41. Can the manufacturer remotely diagnose the printer?
Has potential but depends if you wish to activate it.

42. Do the tech support people understand fabrics and textiles?
R&D technicians have been testing on different materials, including for tension, adherence, etc. There is Gandinnovations dye sub ink team in Long Island, NY and reportedly a Gandinnovations textile specialist in Portugal.

43. What is the native language of the tech support person?
Being a Canadian-based company, English is the native language of most tech support personnel. However Gandinnovations has tech support representatives in 15 countries around the world.

44. What tech support is available and for how long? What is the wait time on the phone…truthfully?
You can speak with the technician right away. In fact. I saw a tech walking across the demo room with a headphone. He went straight to the Jeti 3348 Galaxy UV RTR, open a right cabinet and led the customer he was talking to, step by step through the repair task he had to perform.

45. Can you provide an extended hardware warranty? Who provides the service? The Dealer or the manufacturer?
Now you have to buy an extended warranty.

46. Do spare parts come from a foreign country? If so, what is the wait time for such parts?
Wasatch maybe Ergo Soft

47. What about the dot pattern of your printer? Is this dot pattern as fine as that of an Epson 10000?
You will not notice any dot pattern anyway on most fabrics.

CONSTRUCTION: AESTHETICS

48. Is the width enough for target applications?
Not many dye-sub printers come any wider.

49. 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 software provides a series of patterns to make nozzle tests. There are no actual sensors for nozzles

50. How can you describe the design of the printer?
All panels are neatly assembled. Although the take-up is a more sophisticated system compared with the other roll-to-roll printers, it doesn´t look difficult to figure out.

51. Can you easily tell which is the "front" and which is the "back"?
You can easily tell which is the front, especially for the cutting and take-up systems.

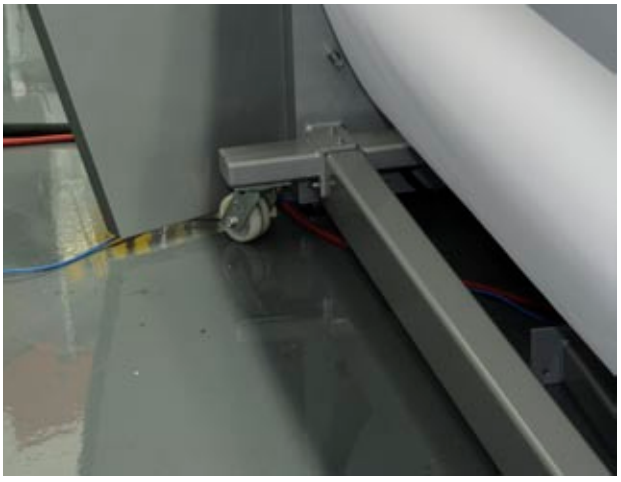
CONSTRUCTION: BUILD QUALITY

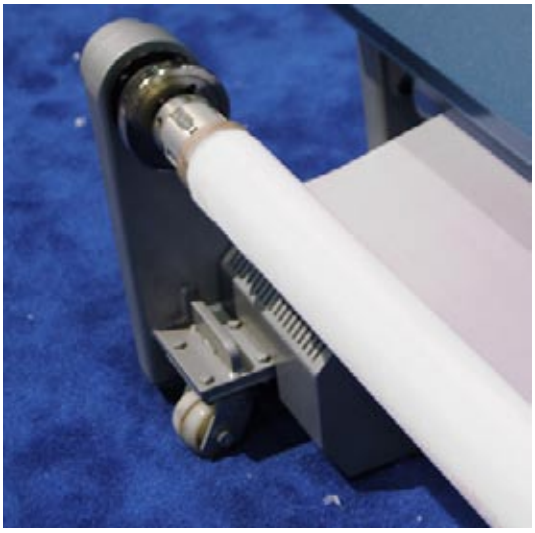
52. What is the solid-ness of the construction of the outer body? Is it plastic? Metal? Heavy gauge?
Not really plastic, the frames are made of steel. The outer panels are made of sturdy aluminum.

53. Is there a front hood and also a back hood?
No hood at all.

54. What is the solid-ness of the inner parts? Plastic, metal?
Clean, neat, precise.

55. Does the printer wobble back and forth when printing?
The Jeti printers are very solid machines. However one of the roll-to-roll machines in the demo room tended to vibrate when printing (due to the rapid acceleration and deacceleration of the substantial printhead carriage). However, vibration was not as noticeable in the Roll-to-Roll Jeti printers at FESPA Mexico 2008.





Besides the wheels, the printer has leveling supports in the printer and in the rewind unit.

56. How many wheels? How many leveling devices? Is the wheel and leveling device the same unit, or separate?
Four wheels on the printer and another two in the slitting and rewind unit.

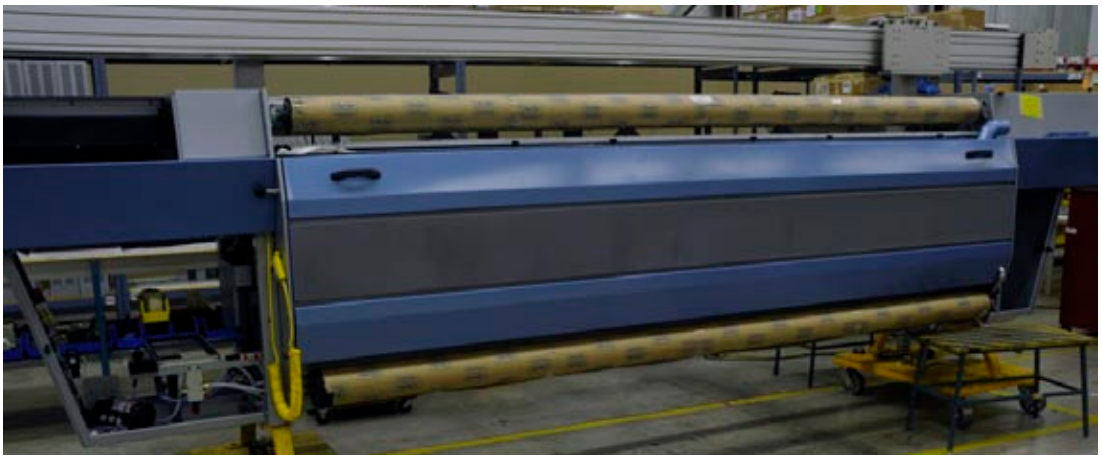
57. After you have used the printer for a while, do parts quickly wear out, break off, wobble, or malfunction?
It is not likely that a Jeti printer will quickly wear out or malfunction.

FEATURES: MEDIA: Heaters

58. How many heaters are used?
One front and one on back, but the whole system is on front. No pre-heater of textile, but ink is pre-heated twice (Slightly above room temperature).

59. Are the heaters before printing, after printing?
The Jeti 3324 AquaJet is equipped with an in-line infrared fixation system that quickly cures the ink and readies the prints for wind-up

60. Is there an air blower as dryer? Where is it situated?
No, only extraction to pull out steam.



This is the built-in infrared heater that cures the ink. You have to grab the handles to lower the gate to arrange the media and let it pass through.

Dr. Nicholas Hellmuth inspecting the inner grill of the infrared heater inside the Gandinnovations factory near the Toronto airport.

*By being inside the factory, with full access to look inside the printer, it is possible to see a lot more than you see in a crowded trade show booth. If you wish to visit the Gandinnovations factory, simply send an e-mail to Tom Reill***y.**

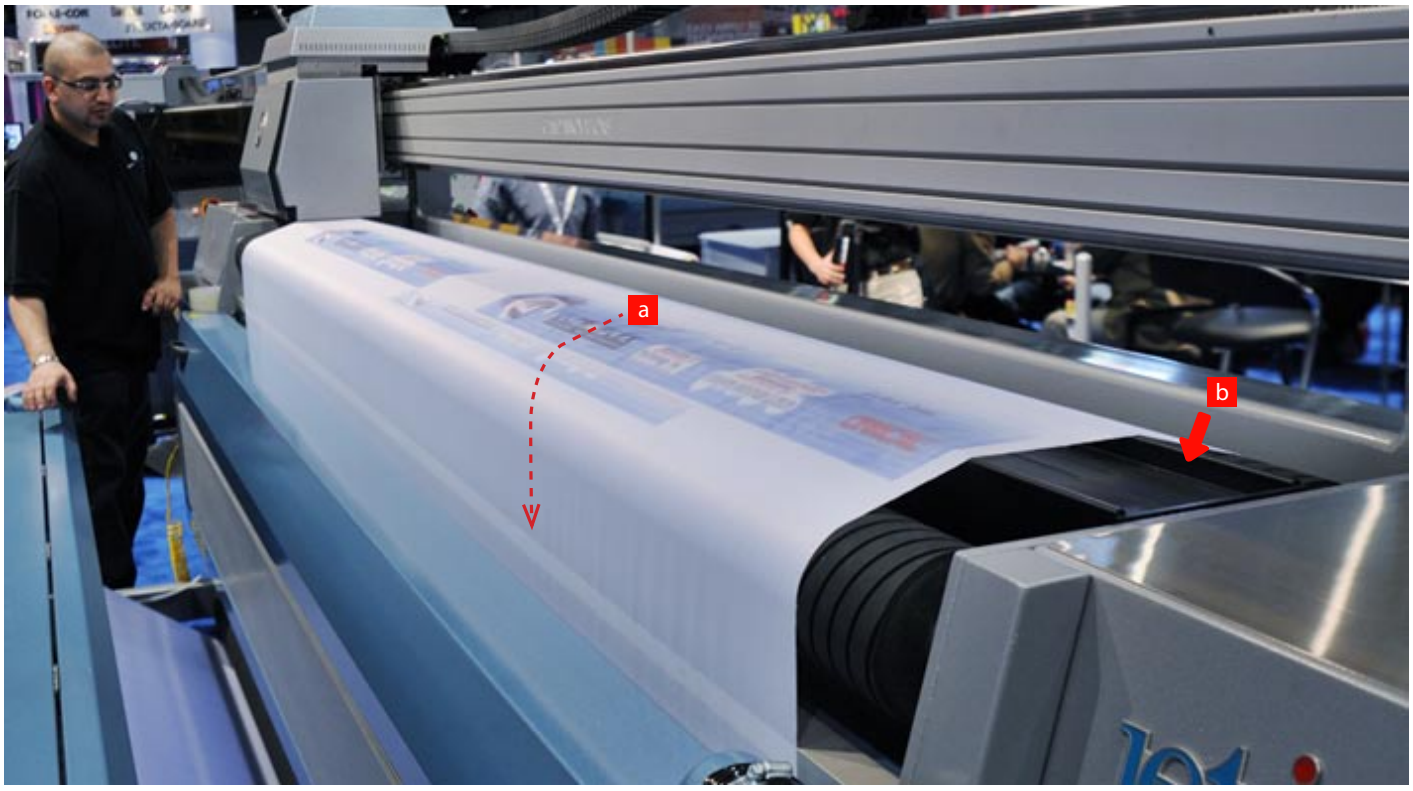
STRUCTURE OF THE PRINTER: Media Transport Mechanism & Media Path

61. 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?
This printer was designed to be a textile printer from the beginning.

62. Is there a moving transport belt or a stationary platen?
The AquaJet is a dedicated roll-to-roll machine, therefore, it has a stationary platen

63. Describe the platen.
This is a textile printer. So the platen is a trough system to capture ink that could potentially leak through the fabric.

64. Are their edge guards at each side (end) of the platen? At left, or at right, or both?
No. Edge guard are more commonly seen in printers that handle rigid materials.



The 3324 AquaJet was built from the ground up to print on textile media. Media is driven by the stepper roller and moved to the heating unit (a). You can see that the printing area is a trough to capture ink (b). ISA 08, Orlando, Florida.

STRUCTURE OF THE PRINTER: Transport Belt

65. Describe the transport belt? What material? What manufacturer?
Material is moved by a pull and tension system; there is no moving transport belt.

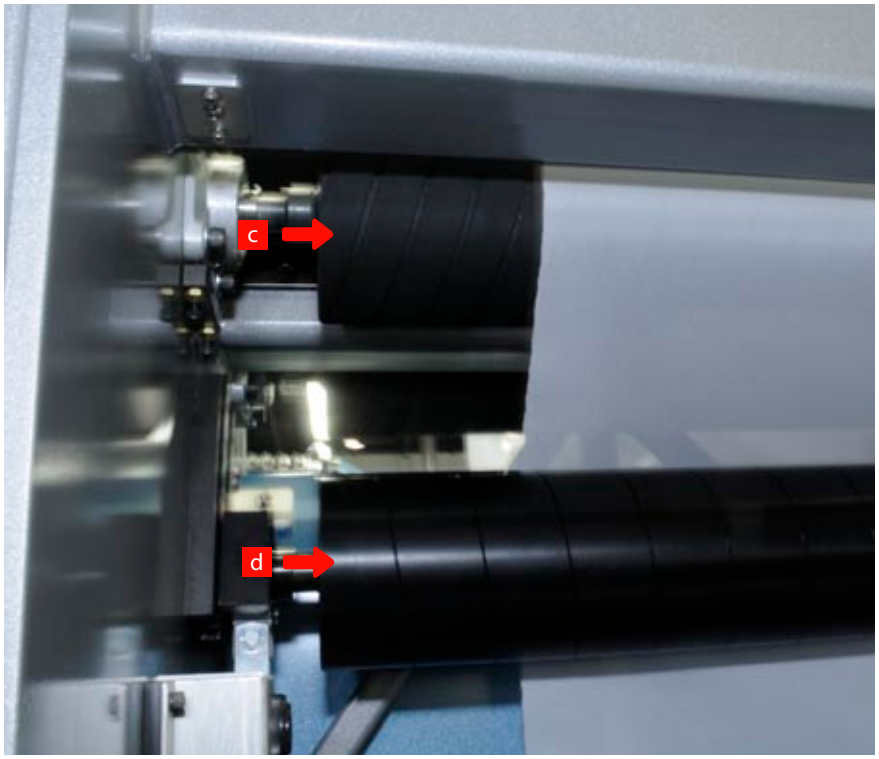
FEATURES: MEDIA: Roll-to-roll feeding

66. How is roll media fed? Pinch roller against grit roller?
Tension, no pinch roller in the normal sense, no grit rollers.

67. What size? What positions are the rollers relative to each other?
The roll-fed system on this printer is more sophisticated than in the other roll-fed printers from Jeti. It uses a total of 8 rollers from supply to take-up roller.

68. Are pinch rollers traditional or a special size/shape/position?
There is only one continuous pinch roller that can be moved upward and downward using a switch at the back of the printer.

69. How are the pinch rollers raised?
Pinch roller is raised or lowered using the pneumatic switch located on the inside right rear chassis.



Rear index roller (c) also called stepper roller. The pinch roller (d) is a continuous roller that is lowered and raised with a switch. In the picture at the left you can note that the rear index roller and the pinch roller have different surfaces (the pinch roller has a glossier surface).

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

71. How is the roll media handled at feeding position? For example, is there a dancer bar?
Yes, there is a dancer bar located diagonally below the feeding roller that goes up and down. It is pneumatically controlled by a very sophisticated system. This dancer bar is diagonally below the feeding roller.

72. At the back, 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).
Yes. The Operator´s Manual some time calls it stepper roller or index roller. But this is the name of both front and rear rollers.

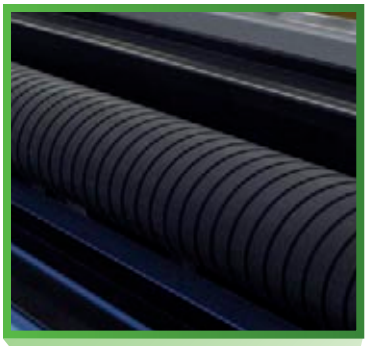
73. At the front, is there an extra roller bar(s) near the platen or transport belt? Is it a bar to roll under the media, or over the media, or are there both (in addition to pinch roller/grit roller arrangement).
At the front, there is a stepper roller with diagonal grooves. But this is a traditional front roller for roll-fed printers. Mario Villanueva, Demo Room Supervisor, commented that the stepper roller has the function of moving the material precisely depending the number of passes you select. The stepper roller has a motor and its tension and movement can be varied via software.

The material is held flat by tension generated by the eight rollers involved in feeding and winding media.

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

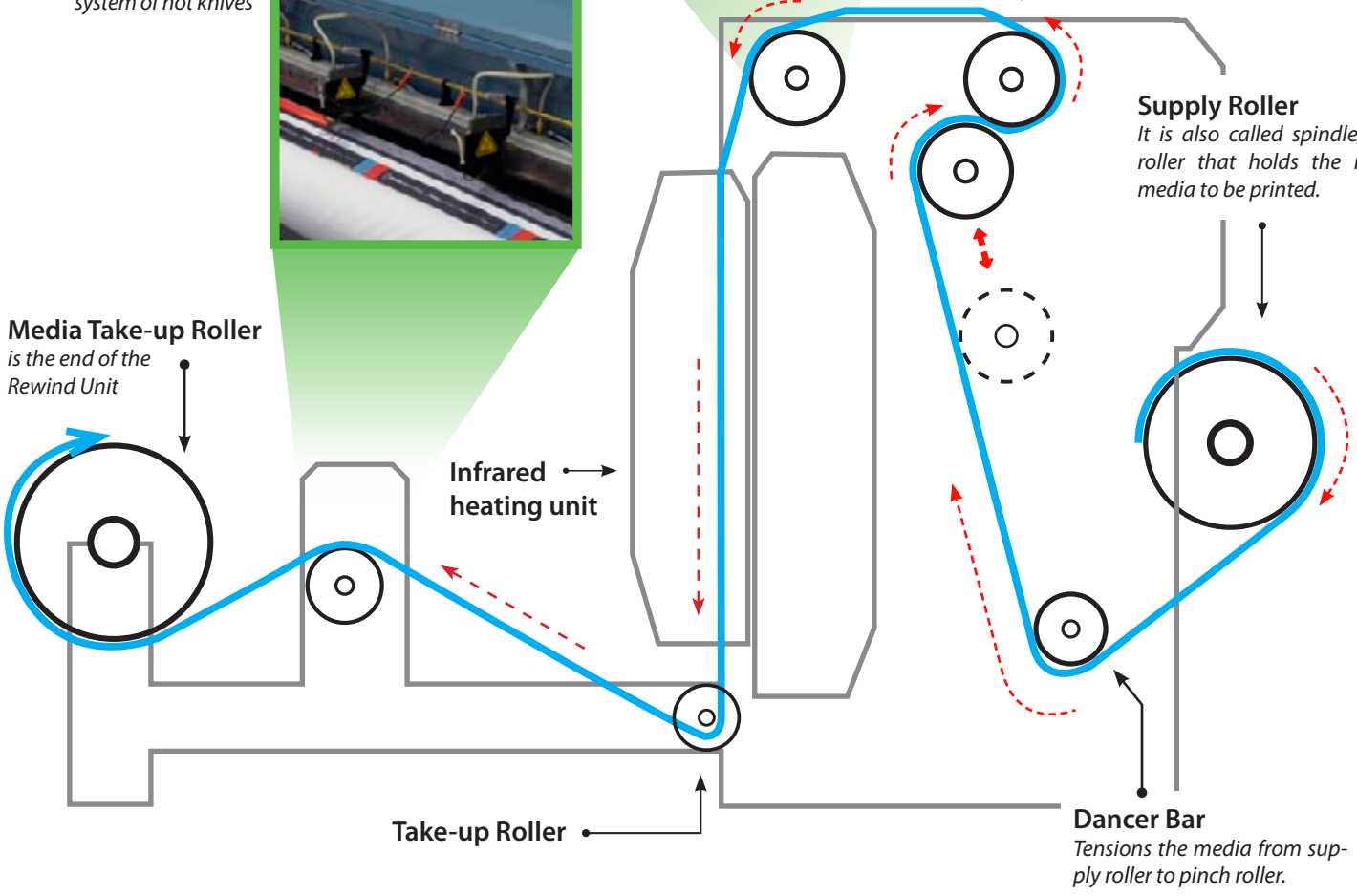
As mentioned before, there are eight rollers involved in the media path.

Media goes from the upply roller to a dancer bar located in a lower position, and goes up behind a pinch roller, then around rear "INDEX ROLLER" (stepper roller) goes over trough, over front stepper roller ("Front index roller) thru oven, goes under bottom stepper roller; then over roller in cutter area, then to air core spindle (or take-up roll), same as other Gandy roll to roll.



Since the The Jeti 3324 AquaJet prints at high velocities, the rollers are grooved to help media adhere.

The cutting unit is a system of hot knives



75. Does the roll-fed material feed evenly?

When you are loading the media, you take it to pass below the dancer bar, then you web the media around the pinch roller. At this point you should align the media against the supply roll to make sure media will not skew.

76. What about the take-up reel? Does it work unattended? Does media skew when it is wound up?

The motor of the take-up reel is controlled via software. Once you enter the direction of the movement of the rollers, they work unattended. But note that the Operator´s Manual advises never to leave the printer unattended.

77. Does material roll up evenly on the take-up reel?

If properly loaded, yes; At FESPA México 08 I checked and the roll was even all the way across.

The Jeti 3324 AquaJet has a system of hot knives to cut media once it has been printed on and rolled into the take-up roller. Any operator should be careful not to touch these knives while the printer power is on.

The unit Dr. Hellmuth is inspecting is about to be assembled to the body of the printer.

The printer exhibited at Gandinnovations demo room has 5 hot knives.

OPERATING THE PRINTER

78. Can the operator manage print jobs via the Internet with this printer?
No.

79. What sensors does the printer have?
- Ink level
- Ultrasonic tension sensor for height
- Purge bucket full

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

81. In the main area for operation, is the machine software based (touch screen), or with physical control buttons? Or Both?
Software based keys, not a touch screen system.

82. How many operators or operator assistants does this printer require?
The main operator will need an assistant at least to load the material.

83. What is the level of ease of use? Can anyone use this printer or do they have to be trained and certified?
This is a user-friendly printer, but the operator must be certified from Gandinnovations.

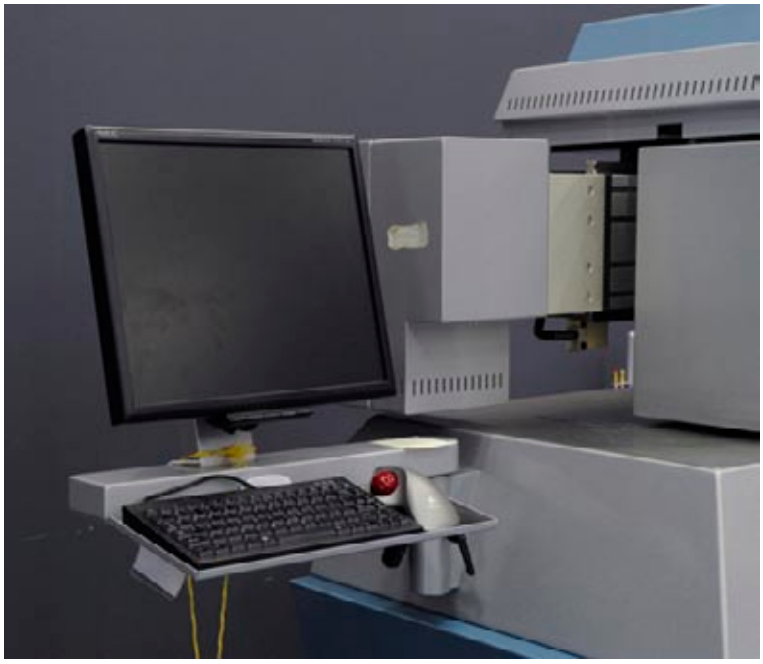
84. Can you do unattended printing? For how long? How about overnight?
The Operator´s Manual warns never to leave the printer unattended while printing.

85. Where does the operator stand or sit?
Front left.

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

87. What controls are at the back of the printer?
Ink is at the back right; electronics are at the back left. You also set the tension of the bar at back right.

88. What controls are at either end of the printer?
Steam extractor vent at back left.



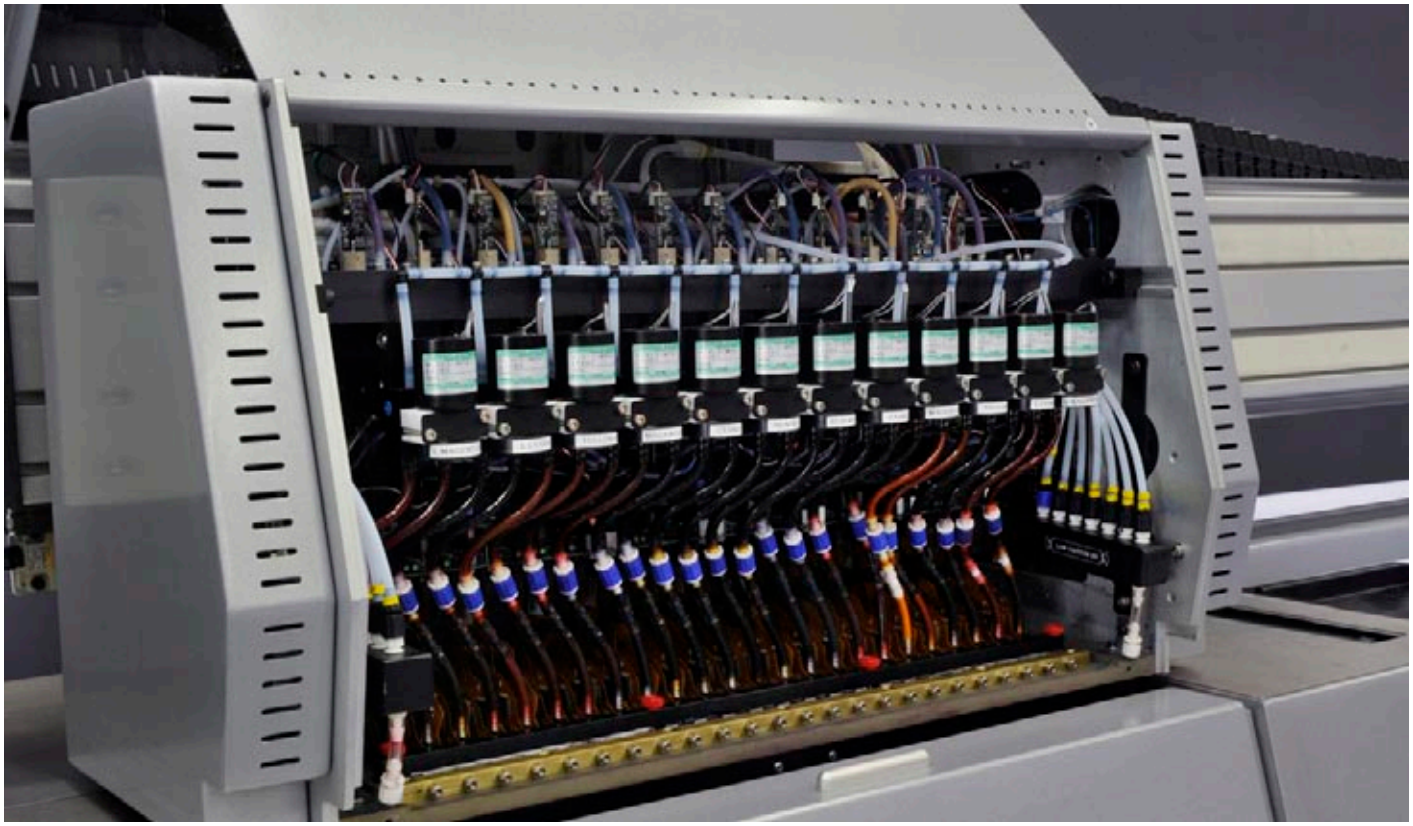
The printer comes with a 17" LCD screen, a keyboard and a mouse. The printer doesn´t have physical controls other than the emercency buttons, most of the operations are software-based.

The main operation area is at left. Cleaning of heads is also done here.

PRINTHEAD TECHNOLOGY

89. What is the brand of the printhead, and model?
Spectra SM 50PL. Although the Operator´s Manual lists the Spectra SL 128 as well.

90. Is the brand and model of printhead clearly identified in the published specifications?
The brochure only lists the brand and quantity of printheads.



The AquaJet works with 24 Spectra printheads, producing a 400 dpi resolution.

On top of the printheads you can see the secondary ink reservoirs. Ink is heated here before getting to the printheads.

PRINTHEAD DPI & FEATURES

91. How many nozzles per printhead?
128 nozzles per head. Both the SL and the SM feature 128 nozzles.

92. Can a sensor(s) detect clogged nozzles and can software provide backup nozzles to cover that missing area on the next pass?
There is no sensor. There is a number of tests patterns you should print to check whether the heads need to be cleaned again.

93. How many printheads per color?
4 heads per color, six colors.

94. Can your printhead technology achieve a solid black?
Yes, blacks are solid dark.

95. What is the drop size in picoliters?
The SM feature 50pl. The SL features 80pl.

96. Is printing bi-directional or uni-directional? What are the different results in speed; in quality?
Although you have both options, printing is almost always done bi-directionally. Uni-directional mode is too slow and does not help much because ink will spread anyway. So the uni-directional printing is not worthwhile.

Spectra heads are industrial heads that will have a long life, but you should give proper cleaning.

97. How many passes can this printer achieve?
2 up to 24. The quantity of passes determines the density of a print job. Just realize that –as in unidirectional vs. bidirectional modes– the more passes, the slower the production speed.

98. How many print modes are there?
On the GUI, the print mode tab allows the operator to modify the number of passes. But in the Operator´s Manual, the print modes are also referred to as the values of X and Y dpi you can enter in those fields.

99. Which materials can be printed fast at 2-pass or 4-pass modes?
You could print at 2-pass mode, but it is not advisable. At FESPA México 08, the AquaJet was printing at 4 or 6 passes. Solid colors need four passes. You can do more passes, but if your design does not have small text, you will not really notice the benefits.

PRINTHEAD LIFE EXPECTANCY

100. How long do your printheads 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.
Dont park your printer and not print for long time. Spectra are industrial printheads manufactured for full-production. They will last you a lifetime, but this depends on the maintenance you give them.

101. 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 printhead cost to replace? Distinguish price for the printhead and also price for the service technician to come and do the installation if it is not user-replaceable?

The brochure states that the printheads are covered by a 1-year warranty valid with the use of Gandinnovations original inks and parts.

If you are in Europe you can contact Marco Sousa, sousa@gandigroup.com who is an AquaJet specialist.

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

There are not as many head strikes with fabric. There is no problem with heat causing bumps in the material.

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

103. How many total number of printheads?

24

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

Not a cluster nor an array.

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

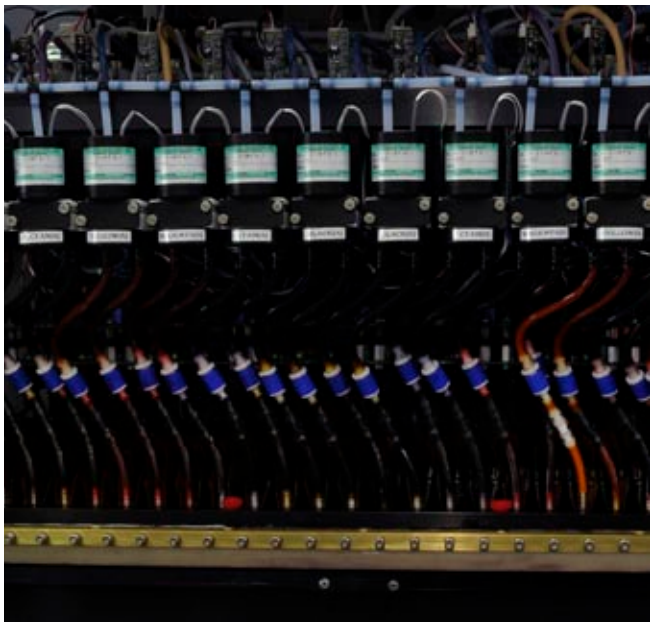
In a row

106. Are the printheads at an angle to the movement of the carriage, or at 90-degrees?

The printheads are at 90 degrees to the media.

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

You place the image you want to print on the Table Display area, on the software. Once there, you can place the image wherever you wish. You can select to use the automatic registration feature that will determine the number of rolls loaded, roll width and the position of the rolls relative to the print platen.



Printheads are arranged in a row, at 90° relative to the media.

108. Can you vary the gap (the distance from the printhead to the media, which is the distance the ink droplets must fly?

Yes you vary the carriage height via software. In order to reduce the chance of crashing the carriage into the media or other obstructions, the carriage height relative to the material being printed on should be manually verified by the operator.

109. What is the nozzle spacing?

The printhead brochure states the nozzle spacing is 508 microns (0.020 in)

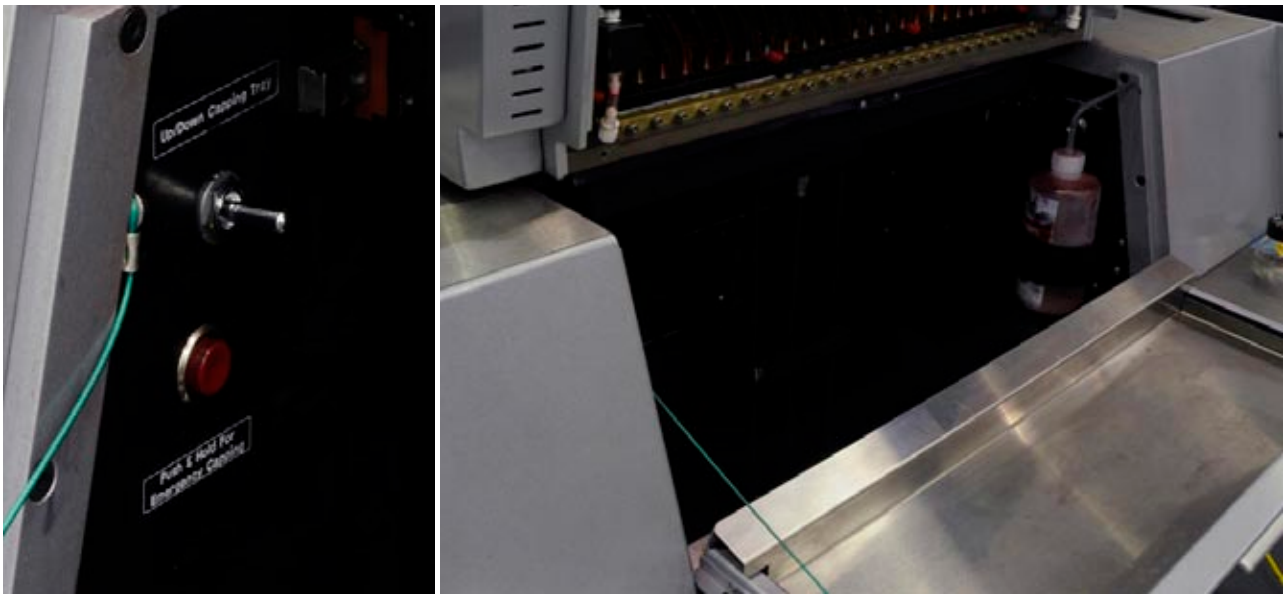
CLEANING & MAINTENANCE

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

Cleaning is done by purging. Gandinnovations literature calls it priming.

111. How complex is it to align the printheads?

Vertical alignment of printheads should be performed every time one or all of the printheads have been removed or if the carriage has crashed against any obstruction. Although you should follow 14 steps to align the heads, it is not complicated.



At the left in the service station you will find a switch to move the capping tray up and down.

112. Is there a capping station?

Yes, and use a layer sarin wrap.

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

Two:

- Quick prime
- Regular prime

114. Can you purge an individual printhead, or do you need to purge all at once?

Yes, you can select what individual printhead to purge, and you can vary length of the purge from ½ to 4 sec.

115. Where is the service station?

Left

116. Is the service area the same as the parking area?

Left

117. Does the manufacturer provide any special cleaning tools?

Yes, in spare parts kit.

118. Does this printer spit, or "weep" at regular intervals?

Not while printing, but yes while in idle

119. Is there a sleep mode? Should the machine ever be turned completely off? Does not entail having a UPS unit to guarantee it is on all the time?

Should cap; after 15 minutes of no use and the machine will cap itself.

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

Up to a week if capped.

The parking station and the cleaning station are at the left.

CLEANING & MAINTENANCE: ROUTINE MAINTENANCE

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

- Check and clean the encoder reader optical sensor
- Clean the encoder strip
- Clean the machine (removing ink and dust)
- Empty the waste tank
- Check for ink in the low vacuum overflow reservoir
- Clean print plate and rollers.
- Perform the Jet Out Test to check nozzle status
- Empty residual oil collection pan
- Drain exhaust unit tap into oil collector pan
- Check and empty the infrared heater exhaust unit hoses

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

The following procedures need to be performed on a weekly basis:

- Clean the nyla (cable/ink line carrier) track and check for leaking ink lines and fittings.
- Perform Test 4 and check the heads vertical alignment.
- Clean exhaust unit air filters.

Twice a month:

- Clean and grease the capping tray rails
- Clean and grease the lead screw of the bucket motor

Once a month:

- Clean all the fans and the cabinets with compressed air to remove dust and dirt
- Grease the four lubrication points on the carriage bearing runner blocks
- Check the air regulator for oil and water

Once every six months:

- Replace ink filters

Once a year:

- Grease the ten roller bearings
- Replace exhaust unit air filters

CLEANING & MAINTENANCE: WASTE

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

The printer does not use solvent flush, it uses water-based cleaning fluid. You flush this out with ink.

124. 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 software generated.

125. Can you select which ink lines/printheads to purge, or can you only purge in clusters or all or nothing?

Yes. You can select which ink lines to prime and/or flush

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

The ink first goes into a waste drain, then to a 4 liter waste tank.

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

The purge bucket is depressed towards the center so that the ink won't accumulate. It drives the ink to the waste tank, which should be checked and emptied once a day.

Also, below the platen, there is a receptacle with a hole in the center, to drive ink to the waste tank.

The rollers should be cleaned as well. The printing area has a trough to capture ink. Waste tank should be replaced daily, but this depends on the use.

128. How often do filters have to be Checked? Cleaned? Changed?
Not as often as on solvent or UV ink, otherwise no changes needed.

129. Is a liquid flush cleaning solvent available as a separate on-board system?
There is no solvent flush anymore because wastes time.

PRINTER DRIVERS & RIP SOFTWARE: FEATURES

130. Can the RIP perform nesting of various sized files across the full width of the media?
The operator at the demo room loaded several images to be printed at the same time.

PRINTER DRIVERS & RIP SOFTWARE: WHAT SHIPS WITH THE PRINTER

131. 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?
Yes. The price of the printer includes a full-strength RIP. Specifically for textiles.

132. If a RIP is bundled with the printer, why might I later wish to add an after-market RIP to be fully satisfied?
The printer originally comes with your choice from Wasatch SoftRip, Onyx or Caldera. These are full-featured industrial RIPs. It is not very likely that you will need an after-market RIP. Recently Gandy switched to rebranding another RIP on their UV-cured printers, but since there was no Gandy booth at the recent VISCOM Germany trade show, I was not able to check on which RIP this printer uses now (November).

INK

133. How many different kinds of ink are available?
Just one; water-based dye-sub. But in the future you can expect a second kind of ink.

134. If there are several kinds of ink available, can you switch from one to another?
In the future there will be another kind of ink.

135. How long does it take to switch from one ink to another?
Eric Huchla, R&D tech, says the changing of one ink to another can be the most tedious task in the Jeti printers. Of course, you should check whether there is another kind of ink for this specialized printer.

136. Does the printer itself have a means to keep track of ink usage? Is this a guestimate, or an actual count of droplets fired?
Are working on more accurate manner, currently is based on pump count.

137. Howmuchinkisusedtoprintasquare unit?
Depends on the fabric and on the profile. 1.20 to 2.4 per square meter.

138. Wherearetheprinter'sinkcontainers located? Front, back, or sides?
Back left.

The Jeti 3324 AquaJet uses water-based dye sublimation inks.

139. Whatistheinkusagecomparedwithasolvent printer?
It varies depending on the kind of fabric you´re printing with.

140. How much ink does the ink container in the printer hold?
One liter.

141. How is new ink added? Pouring into the on-board container? Switching the container to the new ink container?
Pouring. At ISA 08, we could see the operator refilling the printer's ink containers. You pour ink directly on the ink tanks. Since you open the cap of the tank, dust could potentially get into the ink system, that´s why the ink filter is crucial.


New ink is poured into the printer containers, located at the back of the operation area.

142. 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 lite-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 printheads are used in ColorSpan and Western Graphtec printers too. This means that lots of economical media is available for these thermal printhead machines.

Gandinnovations has its own dye sub inks, and you are sheltered by warranty only if you use Gandinnovations ink. However, the brochure states that the printer handles on a wide range of polyester fabrics or a blend of polyester.

143. What kind of protective devices are on the ink system to keep you from using after-market ink?
There are no protective devices at all.

144. 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?
On the monitor. There are 12 reservoir capacity sensors found in each one of the secondary reservoirs on the head carriage. The sensors provide feedback information to the software and monitor the ink levels in each one of the secondary ink reservoirs.

145. Is there an issue with "Ink Starvation"?
Have seen at 2 pass, any rare.

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

147. What color shift do your dye inks go through during their drying cycle?
" You can wash fabric 30 times and may have no color shift". This was mentioned by a customer. This will depend on ink laydown.

148. What filters are on the ink system to trap particles?
The Jeti AquaJet printer uses ink filters that serve as an important safeguard against the potential plugging of secondary ink reservoirs. Properly maintained ink filtration ensures uniform ink characteristics.

149. How often does the filter need to be replaced?
The ink filter should be replaced every 1000 hours (6 months at 40 hours of operation/week) or when ink is not freely flowing.

INK: COST

150. Does ink come in cartridges or bulk? How large are the ink containers for replacement ink?
Ink comes in 4-liter containers.

INK: LONGEVITY

151. What is the longevity of your dye ink outside in the sun? No lamination, no glass.
Depends on weather. It may last 1 to 2 years if coated for outdoors.

INK: COLOR GAMUT

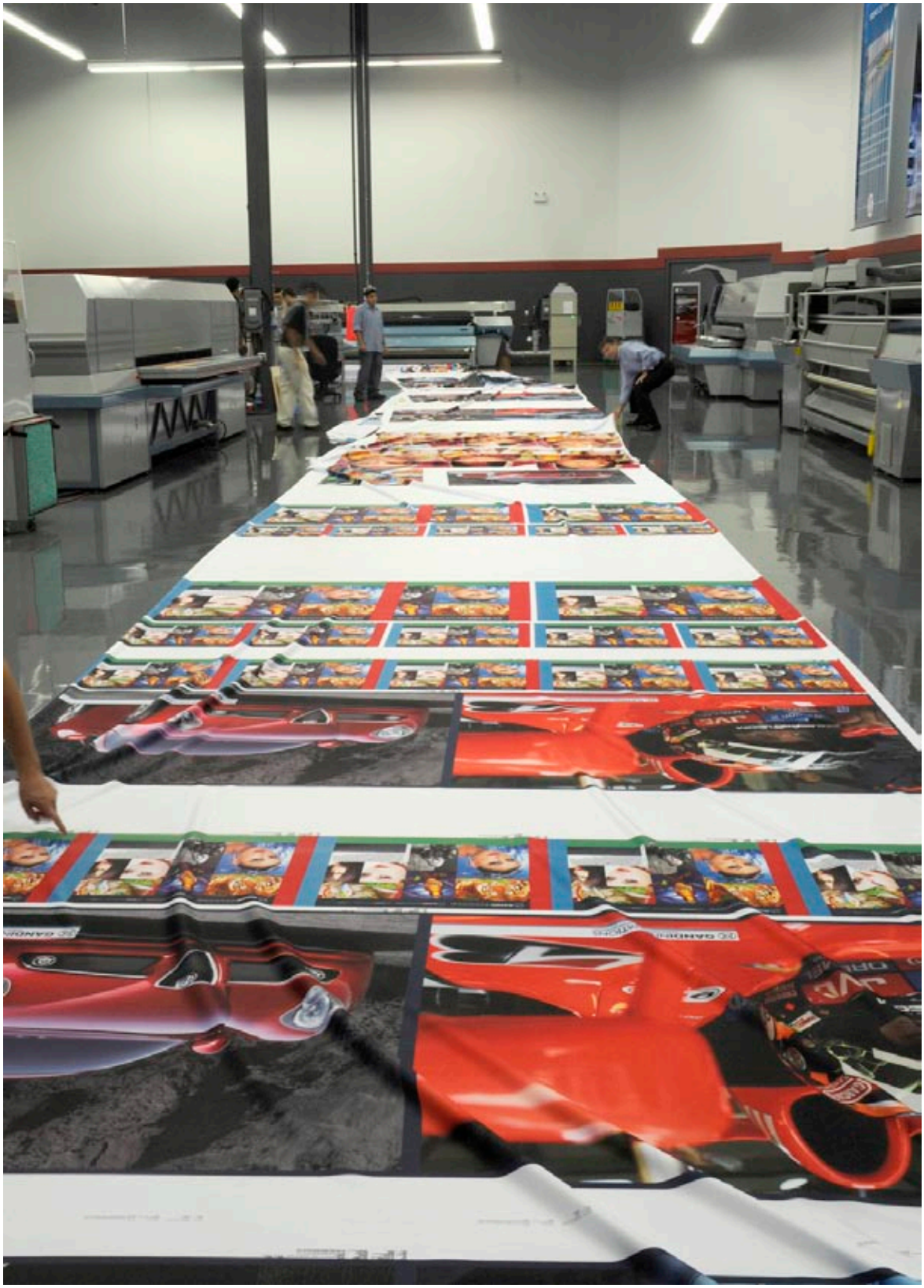
152. How many colors are used in the ink-set being evaluated here?
6 colors. CMYK + lc, lm

153. What claims does your printer make for color gamut in your advertisements?
The brochure talks about the properties of the ink being capable of achieving vibrant colors that are brilliant. We could witness this is true.

154. What colors work best?
Yellow lemon perfect, blues very good, black and white good, yellow duck outstanding, orange duck beak outstanding, salmon fish outstanding, leaf green outstanding, deep tomato red outstanding. But if image is poor, colors are poor too; so if reds are off to begin with, will be off printed image.

The inks and the cleaner liquid come in 4-liter containers. Considering this is an industrial printer, having a second or third kit of inks at hand is a must.

The best colors displayed by the AquaJet at FESPA México 08 were pink, some reds, skin colors, hair, some oranges, green grass, but otherwise most greens are too yellow. And many yellows are too green. But colors on textiles are not the same as using solvent inks.



The reds were another beautiful color. Skin color was also excellent.

All the samples were characterized for the vibrant colors.

MEDIA

155. What core diameter(s) of media will this printer accept?
3". Bracket could be used for a larger diameter. You could borrow a roller from another printer.

156. What thickness media is accepted?
You can raise carriage height to some degree.

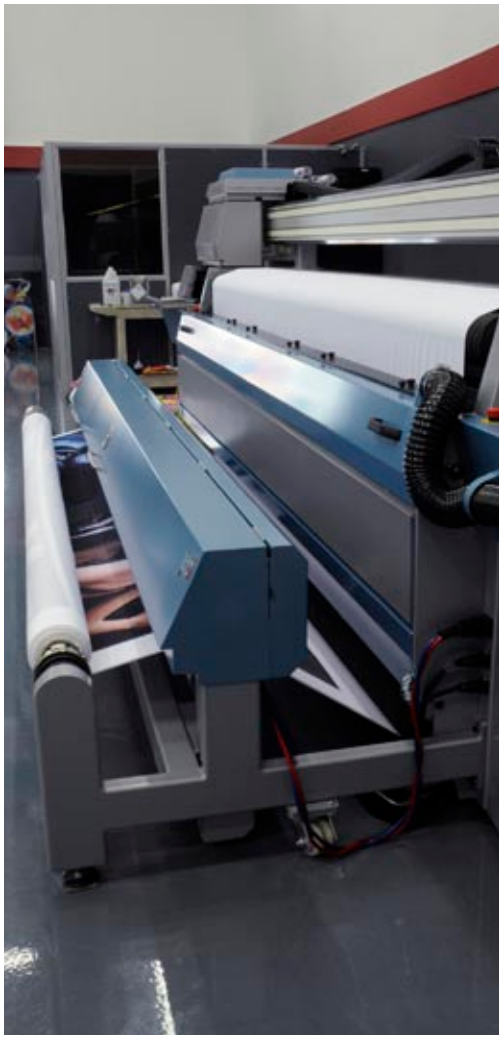
157. What widths can be printed?
3 meters (rollers are 3,2 m)

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

159. What length of roll is accepted?
Depends on thickness, but susally 100 feet.

160. What is the maximum roll diameter?
10"

The Jeti AquaJet handles rolls up to 3 meters wide.



This is the slitting unit that works with heated knives.

161. Can the machine handle two different rolls of media side by side at the same time?
Yes, two, do not need to be identical length

162. Is printhead height adjustment available? Is it manual, automatic, how much?
Software, in gui, you can specify.

163. Is there a cutter on-board? Is it manual or automatic?
Temperature is adjustable, no residue if heat is enough.

The Gandinnovations Jeti 3324 AquaJet prints on most polyester-based fabrics.

164. What textiles does the manufacturer list?
The media used must be pure polyester, or if a blend, then at least 85% polyester.

165. What fabrics are best not to try at all?
Must be able to handle heat, so be wary of 100% cotton.

166. What about thin or stretchable fabrics?
Stretchable fabrics can be tricky, flag material is okay, vary ink load depending on fabric.

167. What about rugs and comparable thick materials?
Have no tested rugs; Marco in Portugal is testing fabrics.

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

169. How does this printer handle ink that goes through the weave but gets stuck as droplets on the back of the weave? How does it keep these ink drops from getting on the rollers or soiling another part of the fabric when it reaches the wind-up reel?
After media is printed, it goes into the heating unit, which will dry any ink remaining.

MEDIA: ISSUES

170. 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?
You can feed various rolls simultaneously on the same supply roller. You can set the software to print in multi-roll function. There is an automated registration feature that will determine the number of rolls loaded, roll width and the position of the rolls relative to the print platen.

171. Can the media feed without skew?
If fed in straight to begin with this helps, media will shrink if it hasn´t been pre-shrunk.

IMAGE QUALITY ISSUES

172. What sort of things causes image quality issues?
Dust in all printers. Bits of the cut media (that is cut by the auto-cutter) is such a problem on the Epson that most professional users don't or can't use the auto-cutter.

173. Can you please explain banding and list five potential causes of horizontal banding?
- Tension issues on flexible fabrics
- Nozzles not being fully open
- Lack of enough air pressure to stepper roller and dancer bar

174. Can a glossy finish be achieved?
This is a dye sublimation machine aimed to print on textiles. Glossy is not a common kind of output on polyester-based media.

175. Is there banding in areas of solid black?
I did not notice banding, but with the wave of the textiles banding would not be noticeable anyways.

176. How can banding be avoided?
- Ensure all print heads are firing, perform Color Bars Test
- Check Step adjustment
- Check tension adjustments
- Check air pressure to dancer and stepper roller cylinders
- Check dancer roller alignment
- Check Low and High Vac
- Check Vertical Head Alignment

177. How susceptible is the ink to abrasion?
Not an issue because dye is inside.

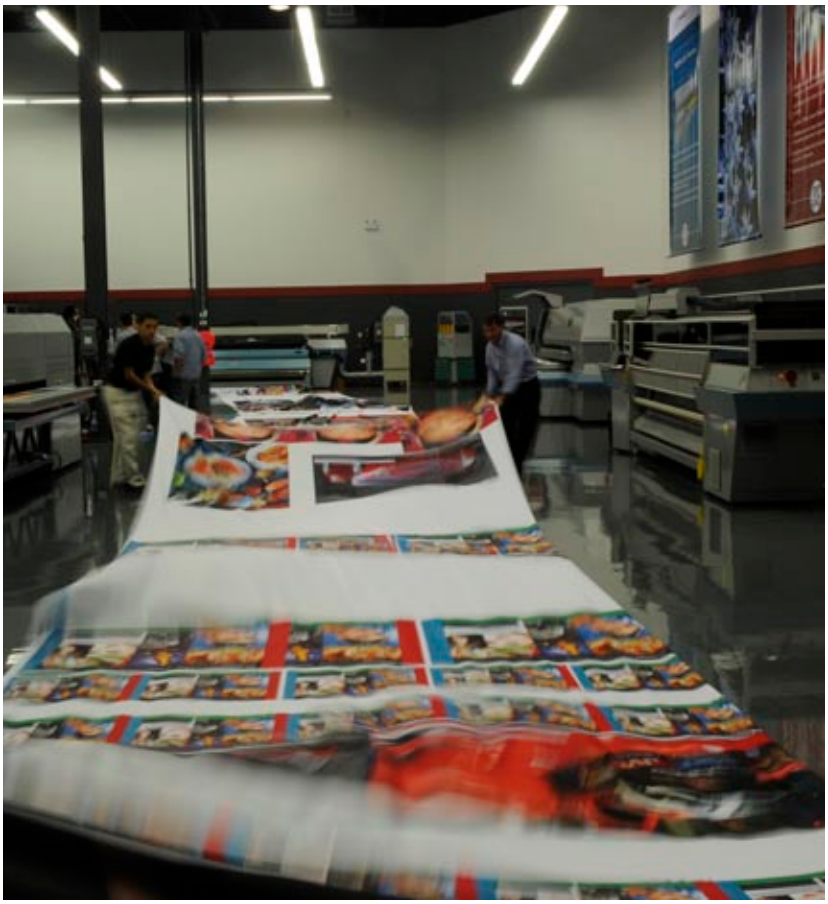
178. Is ink drying time an issue?
Once out of oven it is dry.

APPLICATIONS

179. What are the applications listed by the manufacturer?
The Jeti 3324 Aquajet that has the capability to print on flexible substrates.

Flags, Reupholstering sofas, soft signage.

Realize that the 3324 AquaJet will readily print on materials that a dye sublimation printer ca print upon. Keep in mind that the materials must be able to handle a significant amount of heat due to the sublimation curing process of the 3324 AquaJet.



It took four persons to handle the length of the media being printed on.

PRODUCTIVITY & ROI (Return on Investment)

180. What productivity claims does the printer manufacturer made?
2 pass to 24 pass, depends on many factors.

COMPARISONS WITH OTHER PRINTERS

181. When people are considering buying this printer, what other printer(s) are they also looking at?
D-Gen, VUTEk 3360 perhaps. and now Keundo.

The textile printer of L&P Virtu is not really offered any more. But the L&P Virtu HD8 has an auxiliary dye-sublimation heater inside. However this is a "lite" option and is not intended to create a full-scale dye sub printer. Nonetheles, it is the only UV printer that I am aware of that can also do at least basic dye-sublimation.

Otherwise, there are not that many industrial-sized dye-sublimation printers from manufacturers of solvent or UV printers. D-Gen is a developer exclusively of dye-sub printers. They showed a new model at VISCOM Germany 2008.

Yuhan-Kimberly launched a new production printer for textiles at SGIA, their K2 (full name Visual Ultimate VU: 1800). The difference is that the Yuhan-Kimberly and Keundo printers can handle nano-pigmented textile ink, reactive dye textile ink, or dye sub (they are not limited to dye sub).

182. What aspects of the selected printer help decide in its favor?
Gandinnovations printers are more state-of-the-art, more sophisticated; Jeti technology is better than most other brands, and Gandinnovations is more committed to dye sublimation chemistry and technology than VUTEk or HP Scitex. But Yuhan-Kimberly has an entire division dedicated to developing textile inks (DTP Link). And Keundo is now more devoted to textile printers in general, since they have not really moved forward into the UV-cured market as much.

ADVERTISING CLAIMS: realistic, exaggerated, or misleading?

186. What have been recurring maintenance issues?
You must go and clean out the gutter when using flag material. You must clean your rollers because naturally, lets ink through. So you have to clean heads, clean gutter, and clean rollers.

GENERAL CONSIDERATIONS

183. Are any systematic mechanical problems documented? For example, consistent complaints. If you asked outside industry experts would they reply, "Ah, yes, Printer XYZ is known for potential XYZ glitches."
Exhaust units originally were resulting in a terrible smell, so Gandinnovations switched to a new system.

184. Please indicate the problems in the initial introduction of your printer, between the first ads and/or first showing of the printer at tradeshows? To what degree were early buyers also beta testers?
Is a production machine but Gandinnovations is still improving system.

185. 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?
Maintain ink, otherwise, if you don't run out of ink or media, you could consider letting the printer run overnight.

Pros

Gandinnovations already had experience making an earlier generation of dye-sublimation printers, so this is the second generation.

The output is gorgeous. The entire booth at DRUPA 2008 was printed with this machine. The colors were bright and saturated, better than output of other brands.

Cons

If all you ever need is dye sublimation on polyester, that is the intended market for this printer. But if you need to print on cotton, silk and other diverse fabrics, those are not the intended applications for the AquaJet.

Although the printer is out of beta-stage, features are still being improved.

Realize that sublimation inks are a dye, not a pigment, so the finished output is not intended to be displayed outside in the bright sun for very long. Indoor the images last months longer, but in general dye sublimation ink is for seasonal banners and billboards or soft signage at a trade show. The output from dye sub printers is not intended for multiple-year exposure to sunlight coming in from windows.

Some other competitors have said that it can print only on polyester.

Gandinnovations and Agfa have now publicly announced that Agfa has purchased Gandinnovations. Obviously there has been a lot of other things going on behind the scenes, but we do not publish on those aspects. We will not re-issue any comments on the printers until we can understand how the printer manufacturers' two diverse corporate cultures will be united

Comments

This initial report is a discussion of the printer, is not in itself a recommendation (neither for or against) because a recommendation can only come when I can inspect the printer in a printshop to see how it functions in the real world.

As soon as it is possible to undertake a site-visit case study of the success of this printer in a major printshop we will update this report. Presently FLAAR is booked solid literally around the world inspecting printshops and printer factories, so there is a waiting list for getting us to printshops to do site-visit case studies. But we do intend to follow-up this factory and demo room study with a site-visit.

Water-based is ont as toxic as solvent in UV systems.

Because the AquaJet has suction with filter, head strikes are not a very common issue: fabric will not bubble-up. Once you have sections, the system can handle the same fabrics again without change.

Auto-dry function is new. Same speed as in oven printing. Currently the printer works only with synthetic polyester. If you need to use blends, they must be at least 85% polyester.

In the future, customers will have the option to purchase another ink, nano pigment. The tension system will have (need) more functions.

Mechanic and electric upgrades can be done by Gandinnovations.

Most recently updated November 2008
First issued August 2008

FLAAR Reports

Coming During 2009

Dye-Sub Calendering heat presses	Oil-Based Dye Sublimation	Solvent-Based Dye Sublimation	Water-Based Dye Sublimation	Direct to Textile Printers	Dye Sub via Transfer Paper	Transfer Papers	Textile RIP
Acid Dye Textile Ink	Reactive dye textile inks	Pigmented textile ink	Hybrid UV Textile Ink (Sensient)	UV-cured Ink for Textiles (Durst)	UV solutions via L&P Virtu	Spectro-photometer ICC profiles for textile printing	Printable fabrics, such as from 3P
Major Textile printers	DigiFab	ATP Color	Sensient	Seiko	Mimaki Textile printers	Mutoh Textile printers	Roland Textile printers
D-Gen	MS	A-Tex					
Monna Lisa	KonicaMinolta	Practika					
Zimmer	Shima Seiki	Keundo					
Ichinose	Sensient	Hollanders					
Robustelli	TexPress	Reggiani					

In 2007 it was possible to begin a long-range sponsored research project on inkjet printing of textiles. This began with a visit to Yuhan-Kimberly in winter 2007 and was followed up by a second longer visit to their DTP Link inkjet textile facilities in 2008. So now it has been possible to test all three of their printers.

The next stage is to inspect Yuhan-Kimberly MC3 Extreme printers in-situ in printshops and write site-visit case studies. This is being planned for later in 2009.

At SGIA 2008 it was possible to finalize discussions with DigiFab for a second project on inkjet textiles. I had been noticing their success in the wide-format textile world for several years and have visited their DigiFab headquarters in Los Angeles. I especially am impressed by their own in-house textile RIP, Evolution RIP.

Presently I am in discussions for possible future projects on hybrid UV curing of textile inks. These are special inks from Sensient that I first saw in action at VISCOM Italy. As soon as it is possible to visit the ink company and visit the separate company that is manufacturing the actual printers we will launch this new project.

Every several months during 2009 look for addition web pages on dye sublimation and additional FLAAR Reports on wide-format digital inkjet printing of textiles.

Printable Fabrics

About five years ago it was possible to visit the headquarters of 3P Inkjet Textiles (while I had been flown to Germany as a consultant for a large paper mill that wanted to switch from traditional paper to making media for wide-format inkjet). 3P was not far away, so I visited them.

I have also inspected the printable textiles of 3P for over seven years at trade shows around the world. A new FLAAR Report is coming out on February on this subject. Plus it was possible to meet with Thomas Poetz at a lecture I gave at a technical university outside Salzburg three years ago. So I know the company for a long time.

Here are the PDFs on textile printers that FLAAR offers so far:

In progress a future FLAAR Report on: Calendering Machines: Heat Transfer Press for Dye Sublimation.

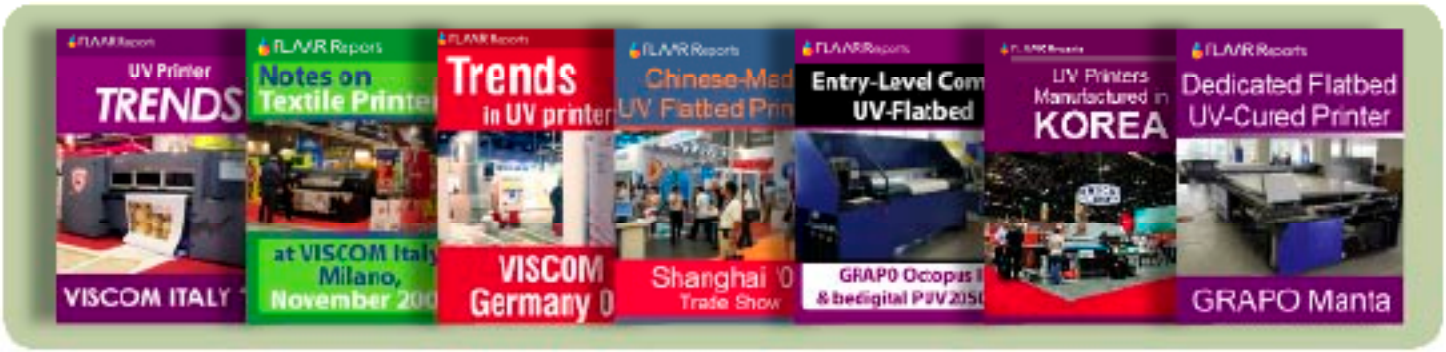
This report will be available as soon as we establish contact with the key calendering machine manufacturers so we can be trained in their company demo rooms. There is not enough time at any trade show, not even 14 days of DRUPA, to inspect all the printers, substrates, RIP software, inks, and accessories for a complete workflow (laminators, cuttters, trimmers, etc). So visiting Monti Antionio, AIT, Klieverik, DigiFab (DigiHeat), Transmatic or AIT will be necessary before the FLAAR Report on calendering machines will be issued.

IF YOU WISH TO MEET DR HELLMUTH and speak with him about textile printing, he will be at the Dubai sign and printer show in mid-February. Towards the end of February you can meet Nicholas at the WP Digital InHouse launch of a 5-meter roll to roll UV printer at the Spuhl factory in Wittenback Switzerland.

During the last two weeks of March you can meet with Dr Nicholas Hellmuth in Croatia or any of the neighboring countries. He will be there for two weeks. Contact the nearest office of IB-ProCADD to see which day in which city.

You can also make an appointment to consult with Dr Hellmuth at ISA 2009 or FESPA Digital 2009 (e-mail FrontDesk@FLAAR.org or Skype flaar_mesoamerica).

But the main advantage of coming to the Spuhl Virtu (WP Digital) InHouse event is that there is no cost, no fee to speak with him on Feb. 26 or 27, 2009.



These reports on RIP software and Color Management for serious UV printers are free downloads on all FLAAR web sites (follow the link to 'free downloads') http://www.wide-format-printers.net/reviews_reports_evaluations/free_download.php

RIP, COLOR MANAGEMENT, and ICC Color Profiles options

Once you have a serious UV-curable wide-format printer, you may prefer to have an equally serious RIP software and color management equipment.

The RIP software for simple water-based printers such as Canon, Epson, and HP may not be the same RIP software that could be most effective and productive on a UV-curable flatbed or UV-cured roll-to-roll production printer.

I first noticed Caldera RIP on Gandinnovations UV printers several years ago, then I saw Caldera being used at the Mutoh Europe factory demo room in Belgium.

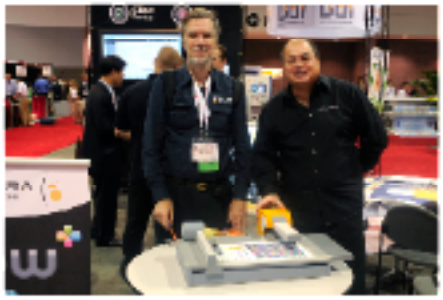
When I was visiting the Durst factories in Europe I again noticed that they were using Caldera RIP software.

So I requested access from Caldera so I could visit their world headquarters in Strasbourg, France, to spend several days learning more about their RIP. As a result there is now a FLAAR Report photo essay on this software.

Most recently I have seen Caldera RIP at the Shanghai printer trade show in China, at DRUPA in Germany, at FESPA Digital in Geneva, SGIA '08 and Viscom Italy '08.

When I visited a large printshop in Maribor, northern Slovenia, they were using Caldera RIP and the manager of technical services for this company said, "*Caldera does a good job.*" This company in Slovenia has about eight UV printers (about five of them from Durst) and an equal number of large solvent printers. They originally used a GretagMacbeth color management system but switched to BARBIERI because the BARBIERI spectrophotometer can read more efficiently and can handle textiles, backlit, wood and other materials that are either awkward or difficult on other brands of color management instruments. You can learn about the BARBIERI equipment either from their headquarters in Brixen or their distributors worldwide.

Caldera also offers a highly regarded spectrophotometer from Barbieri, the leading color management company in Italy (they are headquartered in the same city as Durst, the manufacturer of Rho UV-cured printers).



For further information on Caldera contact Joseph MERGUI
mergui@caldera.fr
If you have questions about color management, if you are in the US you can contact: ImageTech at:
www.ImageTechDigital.com
Mark Spandorf (owner and president), mark@imagetechdigital.com
or 510 238-8905.
If you are in Europe or the rest of the world you can contact **BARBIERI** directly at: BARBIERI electronic snc,
info@BARBIERIelectronic.com
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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).

Licensing Information

If you wish to distribute this report to other people within your company, please obtain a site licensing agreement for multiple copies from FLAAR by contacting ReaderService@FLAAR.org Substantial discounts are available for licensing to distribute within your company; we call this a subscription. The advantage of a subscription license is that you can opt for automatic updates. You may have noticed that FLAAR reports tend to be updated as additional information becomes available.

In some instances a license would be available to distribute outside your company, including in other languages.

To distribute this report without subscription/license violates federal copyright law. To avoid such violations for you, and your company, you can easily order additional copies from www.wide-format-printers.NET.

Update Policy

Starting in 2006, 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.

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

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

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

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

The user is advised to test products thoroughly before relying on them. We do not have any special means of analyzing chemical contents or flammability of inks, media, or laminates, nor how these need to be controlled by local laws in your community. There may well be hazardous chemicals, or outgassing that we are not aware of. Be aware that some inks have severe health hazards associated with them. Some are hazardous to breathe; others are hazardous if you get them on your skin. For example, some chemicals such as 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 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 hardware and software. This is why Nicholas Hellmuth is considered the "Johnny Appleseed" of wide format inkjet printers.

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

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

Be aware that some RIPs can only accept ICC color profiles: you quickly find out the hard way that you can't tweak these profiles nor generate new ones. So be sure to get a RIP which can handle all aspects of color management. Many RIPs come in different levels.

You may buy one level and be disappointed that the RIP won't do everything. That's because those features you may be lacking are available only in the next level higher of that RIP, often at considerable extra cost. Same thing in the progression of Chevy through Pontiac to Cadillac, or the new Suburbans. A Chevy Suburban simply does not have all the bells and whistles of the Cadillac Escalade version of this SUV.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Taking into consideration we do not know the conditions in which you may be using your hardware, software, or consumables, neither

the author nor FLAAR nor either university is liable for liability, loss or damage caused either directly or indirectly by the suggestions in this report nor by hardware, software, or techniques described herein because.

Availability of spare parts may be a significant issue

Chinese printers tend to switch suppliers for spare parts every month or so. So getting spare parts for a Chinese printer will be a challenge even if the distributor or manufacturer actually respond to your e-mails at all. Fortunately some companies to have a fair record of response; Teckwin is one (based on a case of two problematical hybrid UV printers in Guatemala). The distributor said that Teckwin sent a second printer at their own expense and sent tech support personnel at their expense also. But unfortunately both the hybrid UV printers are still abandoned in the warehouse of the distributor; they were still there in January 2009. But Teckwin has the highest rating of any Chinese company for interest in quality control and realization that it is not good PR to abandon a client or reseller or distributor all together.
Recently we have heard many reports of issues of getting parts from manufacturers in other countries (not Asia). So just because you printer is made in an industrialized country, if you are in the US and the manufacturer is X-thousand kilometers or miles away, the wait may be many days, or weeks.

Lack of Tech Support Personnel is increasing

The book of sales in the third quarter of 2008 resulted in many tech support problems.

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

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

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

Counterfeit parts are a problem with many printers made in China

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

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

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

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

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

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

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

Be sure to check all FLAAR resources

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

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

Acknowledgements

With 12 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 (EFI Rastek), DEC LexJet, DigiFab, Barbieri electronic, Seiko, Mutoh Europe, IP&I, Dilli, Yuhan-Kimberly, GCC, Grapo, Durst, and WP Digital for providing funds so that we can make more of our publications free to end-users. During 2000-2001 we had grants to cover all the costs of our publications, and all FLAAR Reports were free in those early years. As that early grant naturally expired after a few years, we had to begin charging for some of our reports to cover costs. Now (in 2009), we are seeking corporate sponsorship so we can gradually make another 20% of our publications free to our readers.

Since 2006 we do a major part of our evaluations at a factory and headquarters demo room. Since the university does not fund any of these trips, it is traditional for the manufacturer to fund a research sponsorship. In the US this is how most university projects are initiated for decades now, and it is increasing. In fact there is a university in Austria that is not an "edu" but is a "GmbH", funded by the chamber of commerce of that part of Austria. In other words, a university as an educational institution, but functioning in the real world as an actual business. This is a sensible model.

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, Gerber, Grapo, IP&I, Mimaki USA, Mutoh, Dilli, GCC, NUR, Oce, 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 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 Hewelti-Packard ColorPro printer on our list of recommended printers, but we love our HP DesignJet 5000ps so much we now have two of them, one at each university.

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

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

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

This is what you should expect from an institute which is headed by a professor.

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

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

Grant funding, sponsorship, demonstration equipment, and training are supplied from all sides of the spectrum of printer equipment and software engineering companies. Thus, there is no incentive to favor one faction over another. We receive support from three manufacturers of thermal printheads (Canon, ColorSpan and HP) and also have multiple printers from three manufacturers of piezo printers (Epson, Seiko, Mutoh, and Mimaki). This is because piezo has definite advantage for some applications; thermal printheads have advantages in different applications. Our reviews have universal appeal precisely because we feature all competing printhead technologies. Every printer, RIPs, inks, or media we have reviewed have good points in addition to weaknesses. Both X-Rite and competitor GretagMacbeth provided spectrophotometers. Again, when all sides assist this program there is no incentive to favor one by trashing the other. Printer manufacturer ad campaigns are their own worst enemy. If a printer did not make false and misleading claims, then we would have nothing to fill our reviews with refuting the utter nonsense that is foisted on the buying public.

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

An evaluation is a professional service, and at FLAAR is based on more than 11 years of experience. An evaluation of a printer, an ink, a software, laminator, cutter or whatever part of the digital printing workflow is intended to provide feedback to all sides. The manufacturers appreciate learning from FLAAR what features of their printers

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

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

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

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

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

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

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

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

These are some of the most

Recent FLAAR Reports (2007-2009)

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

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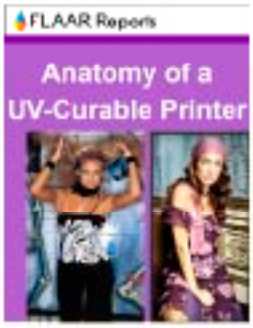

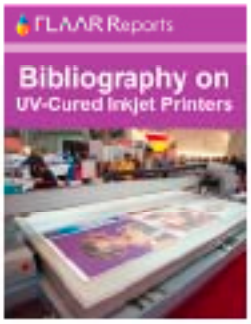

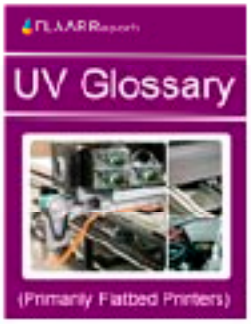

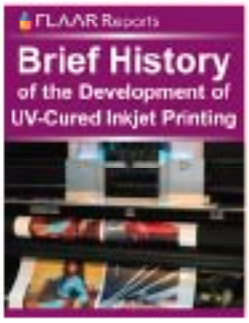

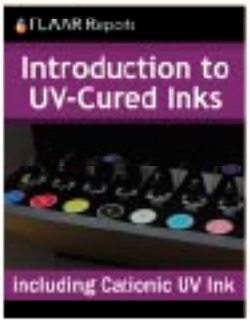

Comments on UV Inkjet Printers at Major Trade Shows 2007-2009