FLAAR Reports

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Wide-Format Inkjet Printer for Textiles
Yuhan-Kimberly UJET MC2

Front cover photograph: Sample printed by Yuhan Kimberly.

Contents

Introduction

Every time I go to VISCOM Italy trade show in Milan, I see lots of special printers for textiles. They come in every size, shape, and color.

At FESPA in Europe and SGIA in the US, many textile printers are exhibited, especially by Mimaki, as well as many retrofitted Roland machines. Because there are so many brands and models, and because digital printing of inkjet textiles is a world of its own, I have always taken notes and snapshots of the textile printers that I have noticed at these trade shows.

At SGIA 2007 I happened to meet two textile experts from Yuhan-Kimberly. One thing led to another and I spent an educational day of initial exposure to their printer in their main demo room in southern Seoul.

It usually takes about a month to write up the notes from such a study project, but I wanted to get this preliminary photo-essay version into our system now.

If you return later in 2008, the updated version of this report will have captions and documentation. But we did not want to wait; I prefer to let our readers know that for 2008 they can look forward to more assistance in learning about wide format inkjet printers for textiles.

THE BASIC QUESTIONS to start with:

1. *Brand name, model?*
UJET MC2 is on the printer; MC2-P is the official name.

2. *What is the nature of the company behind the brand name? Is this company the manufacturer, distributor, or rebranding?*
Yuhan-Kimberly is the Korean branch of Kimberly-Clark, a Fortune 500 company. Yuhan-Kimberly handles the design, manufacturing, and marketing of their textile printer. The chassis of the printer is made by Mutoh in Japan, but virtually the entire insides are stripped out and replaced by a significantly better system for feeding the fabrics.

UJET MC2, Digital Textile Printer

3. *Does the machine manufacture also manufacturer inks for textiles?*
Yes, Yuhan-Kimberly designs and brews some of their own inks and has enjoy knowledge and experience with textile inks to have their other kinds of inks contract manufactured to specs.

4. *Does the machine manufacturer also make textiles to print on with this machine?*
Yuhan-Kimberly makes textile inks and wide-format printers, but not fabrics.

5. *What other printers are the same or similar chassis?*
Several other textile printers are based on the same or similar Mutoh frame, but what is distinctive about the Yuhan-Kimberly printer is that it is designed to handle thin and stretchable fabrics. Some of the other textile printers can handle only paper-backed fabrics or fabrics that are stiff and thick. The UJET MC2 can handle all of these, and even thick pile carpets (thick enough to be door mats or bathroom floor mats).

The original chassis is the Mutoh Japan Falcon II RJ 8000, with Epson printheads, comparable to the Epson printheads used by Mimaki textile printers, Roland textile printers, and Mutoh's own textile printers. But what counts is the ink and the ability to handle thin and flexible fabrics. The ink of Yuhan-Kimberly gives a better color than I have seen with most other inks.

6. *When and where was this model first introduced?*
This printer was introduced in Korea, at PID show, Daegu, March 2005.

7. *Is this printer mature technology or still in alpha-stage or beta-stage?*
This is a sophisticated printer from a company with abundant experience in textile inks and printing on all kinds of fabrics for multiple applications.

8. *Is there enough new on this printer to make it worthwhile buying it if I already have another recent model?*
Most "other" wide-format printers can't handle the stretch and thin-ness of fabrics well. These other printers need the textiles to be affixed to stiff paper (this is how you feed textiles through an HP Designjet printer). Some of the other manufacturers are honest and state clearly that their printers are not equipped to handle flexible materials (or really thick fabrics or really thin textiles).

The UJET MC2 is designed to handle, within reason, a diverse range of textile materials.

9. *List price?*
$50,000.

10. *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?*
This printer can use four different kinds of textile ink. So you buy which of the four that you wish to use as your primary ink.

11. *Do you need a coating machine, steamer, washer, calendering machine?*
As with any other textile printer under a quarter of a million dollars, you need your own steamer, washer, and if you prefer to pre-coat your own fabrics, this you need to do separately (as with any other printer).

PURCHASING

12. *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).
The first years this printer was available primarily in Korea; then India, and now in the US. This printer will be available worldwide during 2008.

SET-UP OF THE PRINTER: PRACTICAL CONSIDERATIONS

13. *What are the electrical requirements of this printer?*
220-230V, single phase, 50-60 Hz. Without heater it draws 3A; with heater it draws 15A.

14. *Are there any special temperature or humidity requirements or preferences of this printing system?*
18 to 30 degrees C., 35-80% RH, for operation. For storage the allowance is more lenient. It is confusing to understand the difference between "operational conditions" and "printing conditions." The latter I can understand, but "operational" implies printing?? There is a better translation in the Product Specifications list, where it calls the 18-30 degree range "printing precision assurance range." In other words, you can operate within 10-35 degrees C at 20 to 80% humidity but there is more assurance of quality at the narrower range. This kind of detail helps the end-user.

Some fabrics require specific humidity: the user manual states that silk chiffon works best at 60% humidity, to reduce ink misting (page 19, user manual).

15. *What is the connectivity?* Network, SCSI, FireWire, USB, Ethernet, or other?
Ethernet. Included are tools and a tester.

16. *What is the size and weight of the printer?*
1.29 m high, 3.069 m wide, .9 m deep, weighing 390 kg.

INSTALATION OF THE PRINTER

17. *How many people come for the installation?*
In Korea one installer and one trainer come.

INSTALATION OF THE PRINTER: INSTURTIONS & MANUALS

18. *Which manuals are hard-copy? Which manuals are only on CD?*
The UJET Manual and the RipMaster Manual are both in hard copy. These are actual books, not just cheaply reproduced and informally "bound."

19. *What is the rating of usefulness of the User's Manual and other associated materials?*
The user manual from Yuhan-Kimberly (UJET Manual) is 211 pages and in general better than most Mimaki manuals that I have seen (which tend to be in stilted English and are written by engineers, not informal enough for the average end-user in many countries). Mimaki manuals are okay, but have translation errors (too literal) and are too formal.

Yuhan-Kimberly, being an ink developer, manufacturer, and tester, also has information on textile preparation and post-treatment fixation (steaming) washing, etc.

Too many other companies just want to sell a printer; take the profit and disappear. These other companies don't always want to hold your hand to teach you how to handle textiles (they just make hardware; they are not really textile companies).

Yuhan-Kimberly is an actual textile, fabric, ink, and printing company; they do a lot more than just make printers.

20. *How difficult is it to obtain the manuals BEFORE you buy the printer?*
I asked for the manuals and was given all manuals that I asked for within about 30 minutes (the time it took to find them, and to print them. I was provided hard-copy (professionally bound) as well as electronic copies).

21. *What schematics does the printer literature provide?*
Basic front ¾ view and back frontal elevation view are provided in the user manual. The cut-away drawing that pictures the path of the fabric through the printer is on page 36 of the manual and is excellent.

22. *What is the native language of these guides?* Is the translation acceptable?
The original language of the guide is Korean. The translation is acceptable but it is noticeable that it is a translation rather than native English.

23. *Is the Service Guide available to the end-user, or only to the service tech engineer?*
Inside what I would call the User's Guide is a relatively complete service manual. Indeed the entire publication is called the *UJET Maintenance Manual*. These are the best manuals I have seen so far.

24. *Is factory training available?*
"Yes, we encourage factory training." I found the team helpful, informative, and keenly interested in fabrics, textile ink, and all aspects of printing.

25. *What on-line training is available?*
There is a training manual but no specific on-line training.

26. *What about follow-up training after you have had the printer a month and know enough to ask better questions?*
Yes, here, another advantage of a Korean company. Between 3 to 6 months after installation training, they recommend follow-up training at a more advanced level. FLAAR definitely supports this philosophy.

27. *What is the original warranty period?*
6 months material and workmanship; this is rather short; industry standard is one year.

28. *Does it include parts, labor, printheads?*
Yes.

29. *What happens if the tech support from your local distributor is uninspired or inadequate? Can you telephone the manufacturer directly? If so, will be manufacturer actively assist you, or only begrudgingly?*
The manufacturer is available as a back-up tech support resource; indeed your questions can go all the way into R&D to potentially work out a new solution to your situation.

30. *What is the native language of the tech support person?*
The original tech support people are Korean. But the resellers will have their own local support staff.

31. *Can you provide an extended hardware warranty?*
Price depends on local reseller, but 10% of purchase price is the industry standard for an extended warranty.

32. *How long are spare parts maintained for discontinued printers?*
Spare parts are maintained for 5 years, and ink is kept available for five years also.

CONSTRUCTION: BUILD QUALITY

33. *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?
- Cover sensor
- Lever sensor
- Edge sensor
- Rear sensor
- HD slide sensor
- Thermistor sensor
- Ink ID sensor
- Ink not present sensor
- Ink out sensor

34. Can you easily tell which is the “front” and which is the “back”?
Yes, the front is where the LCD is, and where the finished print comes out.

CONSTRUCTION: BUILD QUALITY

35. *Is there a front hood and also a back hood?*
There is a modest front hood; there is no back hood on this kind of Mutoh printer.

36. *The front hood, is it strong, or cheap plastic?*
Since the front hood is not very large, and has no windows, it's strength is acceptable.

37. *How many wheels? How many leveling devices? Is the wheel and leveling device the same unit, or separate?*
The four wheels and leveling device are separate but are encased in the same covering.

38. *Does the printer have (carpenters) bubble levels built into the structure of the printer?*
Most printers do not include bubble-levels built into their structure.

39. When designed, what is the life-span that each part is tested for?
The original Mutoh print engine comes with whatever testing that Mutoh Japan undertakes. I know only Mutoh Europe (Oostende), and they test parts thoroughly, so it would be expected that Mutoh Japan does also.

For the parts that Yuhan-Kimberly designs and builds in Korea the life expectancy is five years, which is the statistical life span of most wide-format inkjet printers.

FEATURES: MEDIA: Heaters

40. *How many heaters are used?*
Two heaters: one blows hot air for drying the back side so that ink that has passed through the weave is not an issue to stain the fabric when the fabric is rolled up on the take-up reel. The second heater is an IR heater out in front (on top of the material) for drying the fabric.

The instructions indicate whether to use the air heater, or not. This depends on how thick or thin the material is. Also, trial and error can provide additional experience, though be careful that the printhead does not suffer.

41. *If there is more than one heater, can they be operated independently?*
Each heater can be operated independently. The controls are on the rectangular cabinet that is below the ink cartridge area on the main printer at the front right.

42. *Are the heaters before printing, after printing?*
Both are for after heating.

STRUCTURE OF THE a Transport Mechanism & Media Path

43. *Was this printer made originally as a textile ink printer, or is it retrofitted for textiles?* If retrofitted, what was the original brand or model?
Most printers under $100,000 are retrofitted to accommodate handling fabrics to one degree or another. This printer is one of the better retrofitted models because the people who design it know fabrics and know textile inks. They are not simply a machine manufacturer, they are an inkjet textile company.

44. *Is there a moving transport belt or a stationary platen?*
Some very expensive textile printers have a moving transport belt; but most textile printers in the $50,000 range have a fixed platen.

45. *Are their edge guards at each side (end) of the platen? At left, or at right, or both?*
Yes, there are "fabric guards, retainers" at each side of the platen.

46. *Can you move the left guard, or the right guard, or both?*
Yes, you can slide each edge retainer.

FEATURES: MEDIA: Roll-to-roll feeding

47. *How is roll media fed? Pinch roller against grit roller?*
Although there is a substantial pinch roller/grit roller system, in actuality the fabric is transported by three drive rollers: not just one grit roller. The Mutoh chassis is used only for the printheads, the metal holding the chassis together; the rail for the carriage. Most of everything else is thrown away and has been replaced by specially designed and specifically designed features that can better handle fabrics.

48. *What size? What positions are the rollers relative to each other?*
Instead of a multitude of tiny individual pinch rollers they have found that one single larger roller works best. It is made of NBR rubber.

Most cheaper textile printers try to make do with the original sets of tiny pinch rollers; Yuha

49. *Describe the overall path of the media through the system?*
A cross-section drawing of the printer, on page 36, clearly shows the media path.

50. *How is the roll media handled at the take-up side of the printer? For example, is there a dancer bar?*
Yes, there is a dancer bar for the take-up area.

51. *If the objects you are printing are not as wide as the full width of the printer, does the printing carriage still have to cross the entire space, or can the printing assembly hover just over the area of what has to be printed (and thereby be a bit faster?).*
The minimum over which this printer can hover is 20 cm. It is unlikely you would print something smaller anyway.

UJET MC2 Digital Textile Printer, Roll feed

UJET MC2 Digital Textile Printer, Roll media

UPGRADES, Future Improvements?

52. *What features have been added, or changed since the printer first appeared?*
It is probably fair to say that this printer is being upgraded on a periodical basis. This is not a stagnant model.

OPERATING THE PRINTER

53. *In the main area for operation, is the machine software based (touch screen), or with physical control buttons? Or Both?*
There is no actual computer monitor; there is only a control panel with a simple LCD to allow you to see the options and see the results of your actions (of pressing the control buttons). A small LCD strip is the standard accessory for Mutoh, Mimaki, and Roland, so also for all manufacturers who retrofit these printers with fabric feeding and roll-up systems.

54. *How many operators or operator assistants does this printer require?*
One operator should be enough. When I visited a printshop that had a DuPont Artistri, they said that two operators were needed for that larger printer, to control the fabric feeding at one side and winding up at the other side. In other words, the Yuhan-Kimberly machine is not as complex and handles the material well enough so that you don't have to be simultaneously at both sides of the printer. Of course the size of the Mutoh chassis is a lot easier to walk around than the extensive size of the DuPont Artistri.

55. *Is the position of the LCD screen or monitor user adaptable?*
No.

56. *Can you do unattended printing? For how long? How about overnight?*
Yes, you can print unattended but it's not a good idea to try to print overnight unattended.

57. *Where does the operator stand or sit?*
The controls are at the front right.

58. *What aspects of the printer can you operate from behind (the loading area)?*
The Ethernet cable goes into the back left, just above where the electrical cable is plugged.

59. *What controls are at either end of the printer?*
There is a crank at the left end which is used for set-up.

60. *Is a foot pedal included (for operating aspects of the printer)?*
There is no foot pedal.

61. *Is there a pole with beacon lights?*
Dilli was among the first to use a vertical pole with beacon lights. Most other printers do not have such a beacon. Presence of a beacon is not a major plus point; absence of a beacon is not a significant minus point. Most textile printers do not have a pole with beacon lights.

SAFETY & HEALTH CONCERNS

62. *How many emergency stop buttons are there?* Where are they located?
There is one emergency stop button at the top right.

PRINTHEAD DPI & FEATURES

63. *Is printing bi-directional or uni-directional? What are the different results in speed; in quality?*
Yes, you can select bi-directional or uni-directional printing.

64. *What is the advertised DPI, and is it true dpi or "apparent" dpi?* How is dpi presented (with what adjectives)? How is this dpi calculated? What is the true dpi of this printhead? If the spec sheet uses the concept of "perceived dpi" or "apparent dpi" how they calculate perceived dpi instead of true dpi?
This version of the Epson printhead has two rows of 180 nozzles per head.

PRINTHEAD LIFE EXPECTANCY

65. *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.

The Yuhan-Kimberly data manuals are among the more honest in describing the longevity of an Epson printhead. During 1999-2004, 99% of the booth personnel in Epson and all companies featuring these heads said "Epson piezo heads are permanent, as compared with thermal heads of HP which wear out and have to be replaced." Of course this claim for Epson heads is nonsense: they wear out just like any mechanical object, just that they are made to last longer than a thermal head (but they cost a lot more to replace).

An Epson printhead will last about 20 billion droplets, which is about 10,500 Super B0 pages at 720/360 dpi, bi-directional.

Yuhan-Kimberly is also more ethical and honest in listing clearly the factors that will cause a head to wear out:

- Dust
- Contaminants
- Voltage fluctuation
- Temperature
- humidity

Owners and operators of giclee ateliers report that for a regular Epson printhead in a regular Epson printer (for giclee, photos, proofing), a main cause of deterioration of the heads is purging for cleaning them.

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

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

67. *How complex is the procedure to align the printheads?*

The firmware has a procedure to align the printheads precisely.

CLEANING & MAINTENANCE

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

Head cleaning is by sucking, then having the in-place wipers do a wipe. Both sucking and wiping are automatic after you press the Cleaning button.

69. *Is there a capping station?*
Yes, there is a complete capping station.

70. *Can you purge an individual printhead, or do you need to purge all at once?*
You can select an individual head to purge if you wish.

71. *Where is the service station?*
Printheads are cleaned at the far left of the front of the printer. You remove front/top cover to access this area.

72. *Does this printer spit, or "weep" at regular intervals?*
Yes, the printer is set to spit each time it passes over the sponge.

73. *How long can the printer sit unused? How should a printer be prepared for sitting unused for a long time?*
It is best to use all printers at least one a week to keep their printheads from clogging.

CLEANING & MAINTENANCE: ROUTINE MAINTENANCE

74. *What other periodic maintenance is required by the operator?*
- Clean the wipers (for the printheads)
- Generally keep the printer clean, inside and out.

CLEANING & MAINTENANCE: WASTE

75. *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?*
There is a special area with a "cleaning pump." In other words, cleaning the heads is more sophisticated than on a normal printer with Epson printheads.

76. *Where is the waste ink bottle located?*
The waste ink bottle is easy to find, attached to the top of one of the supports above one of the four corners.

77. *How do you dispose of waste ink?*
There is a firmware procedure to assist in changing the waste liquid tank.

UJET MC2 Digital Textile Printer, Ink

INK

78. *How many different kinds of ink are available?*
Four different kinds of ink are available:
- Reactive dye
- Acid dye
- Disperse dye (dye sublimation)
- Nano-pigment textile ink

79. *If there are several kinds of ink available, can you switch from one to another?*
Yes, there is a "wash cycle" so you can replace one ink with a new kind of ink. Naturally you don't want to do this every hour. But if you are printing on diverse kinds of fabrics, you should either buy two printers (one for each kind of ink), or switch ink every few days.

80. *What company makes the inks? Choices include DuPont, Jetrion (Flint), Sericol, Sun, Triangle, KonicaMinolta, Tetenal and several others.*

Yuhan-Kimberly makes some of the ink themselves, such as the nanoColorant.

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

Cartridges insert into the front right. Bulk ink would tend to be placed in the back.

82. *How is air removed from the ink delivery system and/or removed from the printhead?*

There is a damper system to keep air out of the printheads.

INK: COST

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

Ink for most printers using Epson printheads tends to come in an Epson-type cartridge. In the case of this model of printer the cartridges are 220 ml and not the super 440 ml size. But for some inks a bulk ink system is available.

84. *What core diameter(s) of media will this printer accept?*

1, 2, and 3" cores.

85. *What thickness media is accepted?*

The original model can handle media up to about 2.2 mmm but with an option, you can achieve up to 1.2 cm in total height.

Dr. Hellmuth in the headquarters of Yuhan-Kimberly in Seoul, Korea

86. *What widths can be printed?*
Up to 1.651 meters wide.

87. *Can the printer print edge-to-edge?*
There is a 5 mm margin on all sides. The reason for this is because the fabric edge-retainers cover about 5 mm of each side. But, if you set “edge printing” you can print wider than the fabric edge, into the gutter (then simply remove the edge covers).

88. *What length of roll is accepted?*
50 meters is print length.

89. *What is the maximum roll diameter?*
30 cm.

90. *Can you manually sheet-feed media? Does it feed easily?*
There is an option for sheet-fed media but the question (on any brand of printer) is that unless the front end is affixed to the take-up roller, there is not the same amount of tension as if you merely feed it through the pinch roller system.

91. *Is printhead height adjustment available? Is it manual, automatic, how much?*
Printhead height is controlled manually with a large rotary crank.

92. *Is there a cutter on-board? Is it manual or automatic?*
No cutter is present.

93. *Is there an edge or slot for a hand held X-acto blade or knife to cut printed media off the printer?*
There is no knife-guide slot.

94. *What about thin or stretchable fabrics?*
Most printers for textiles are not made to handle thin or stretchable fabrics.

The UJET MC2 can handle thin and stretchable fabrics because it is designed by a textile ink company. They have an interest in facilitating your ability to print on as many diverse fabrics as is reasonably possible.

95. *What about rugs and comparable thick materials?*
Yes, you can print on thick materials and materials with pile.

96. *Is there a trough to catch the ink that goes through the weave of the fabric?*
Yes, an ink trough is essential.

IMAGE QUALITY ISSUES

97. *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.

These are some samples printed with UJET MC2 at Yuhan Kimberly

Here is Nicholas Hellmuth holding the textile sample printed at Yuhan Kimberly headquaters.

PROs

If a manufacturer simply makes hardware, they lack experience working with textiles. If a manufacturer is a textile ink company, and thus knows all fabrics inside out, they are more likely to create a successful printer. So the main advantage of this printer is that the design team is associated with people who know fabrics, and inks. The result is a more sophisticated feeding system than you find on simple textile printers that are not much more than a water-based or a solvent printer with textile ink instead of solvent ink.

- Manuals, in hard cover, are more professionally produced than of most other printers.

- Manuals are better than anything I have seen from China and are on par with printers produced in the US or Europe (as you would expect from a company such as Kimberly Clark).

Many printer manufacturers refuse to provide their manuals, for fear that I will see lists of things their printers won't do. Yuhan-Kimberly provided me every manual I asked for (got them about half an hour later).

One of my tests for the sincerity of a printer manufacturer is to ask them questions point blank. The managers of Yuhan-Kimberly did not flinch. Many other manufacturers request me to stop asking such delicate questions. Several other manufacturers simply refused to answer questions at all. In distinction, for hour after hour the fabric and ink managers of Yuhan-Kimberly answered my questions one by one.

This printer is what you would expect of a purist; someone who absolutely wants to build a good printer and does not attempt to go low-bid. For example, there are self-diagnostic functions that cover many aspects of the printer. This is what I have learned during three visits to Korea: printers in this country are one step above printers built elsewhere in Asia and light-years ahead of anything built in Mainland China.

When you buy a printer you not only get hardware and software, you get a "family" behind the printer. This is why FLAAR makes the effort to visit as many factories and corporate headquarters as is possible. The week I was visiting Korea I had appointments for the weekdays with Dilli Precision and D.G.I,, and then had to fly to Guatemala to test a 22-megapixel camera for Phase One in Denmark. I had to be in Taiwan the week before, inspecting GCC's UV-curable printers. So the only days that I could visit Yuhan-Kimberly were Saturday and Sunday.

The entire management team was present all Saturday afternoon and many of them stayed well into the night for a lengthy business dinner afterwards. Clearly this company, and it's key people, are interested in end-users and in helping people learn about the results of their years of R&D in textile inks and how best to move fabrics through an inkjet printer.

CONs

Even a good printer has a few weak points. A consistent weak point of any printer using an Epson printhead is the cartridge system for holding ink. A bulk ink system would tend to be better, as well as more economical. Epson has many reasons for forcing people to use their own cartridges.

Warranty is only six months; industry standard should be 1 year.

For more information you can contac via Yuhan-Kimberly Clark tmccraw@kcc.com

Most recently update
January 2008.

Samples made in Yuhan Kimberly

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

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

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

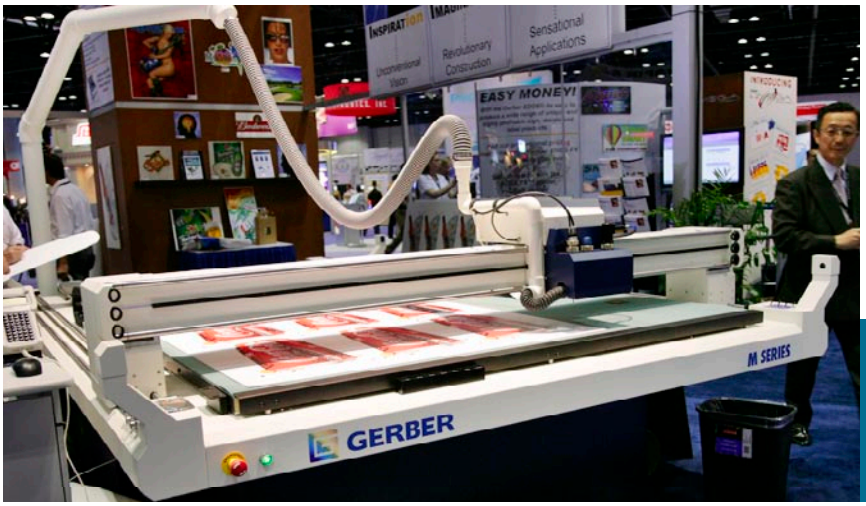
The person we suggest is **Mike Lind** because his company, **Reprographic Designs**, handles all leading brands: KeenCut, Neolt, Meteor Metoschnitt, RotaTrim, etc. You can contact him at 1 281 492 2714 or malind@msn.com.

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

XY Cutter Options

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

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



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

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

DYSS X7 cutter at VISCOM Italy 2008.

DYSS is a thriving company that has exhibited its UV printers and XY cutter both in Europe (FESPA, VISCOM, etc) and in the US (SGIA and ISA). Since mid-2007 FLAAR has evaluated XY cutters and CNC routers at trade shows and by visiting factories such as Zund in Europe and Multi-Cam in the US.

On our next trip to Korea we hope to visit the factory of DYSS. On previous trips to Korea I have already inspected the factory of D.G.I. (twice), IP&I, Dilli, Keundo, and Yuhan-Kimberly (the Korean branch of Kimberly-Clark; Yuhan-Kimberly develops inkjet inks for textiles as well as wide-format inkjet printers). During these inspections I have learned that the quality of machinery made in Korea is equal to, and in some cases better than, UV printers made in Japan and the US).

Planet Digital is the Master Distributor for DYSS XY flatbed cutters and DYSS UV-curable inkjet printers. So in a single source you can learn about both the production stage of the workflow and the finishing stage of the workflow.

Bryan Stringer, CEO, Planet Digital,
Email: Info@Planetdigital.eu
TEL : +44 (0)1963 220900 FAX : +44 (0)1963 220861

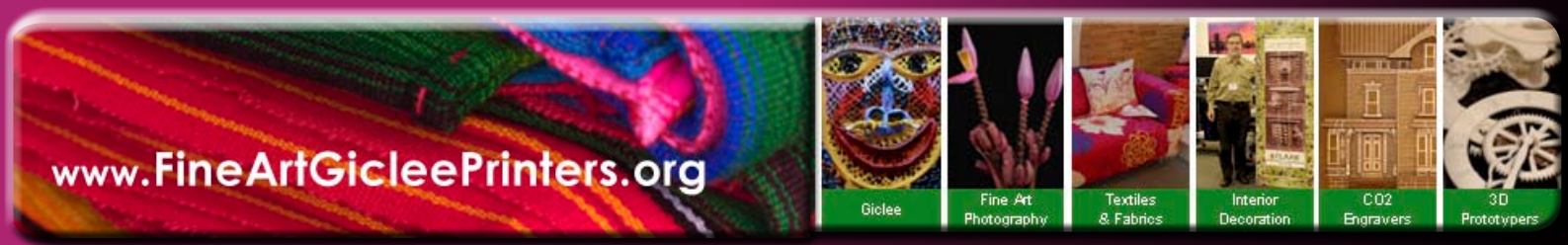
This contact information telephone and fax number is for all of Europe, Middle East, and Africa. If you are in the US, you should utilize the e-mail address for contact.

Enjoy visiting other

FLAAR network web sites

Water-based Inkjet: photo, indoor signage, advertising, proofing, CAD, GIS, , including textile printers

www.wide-format-printers.org



Printing Fine Art Giclee

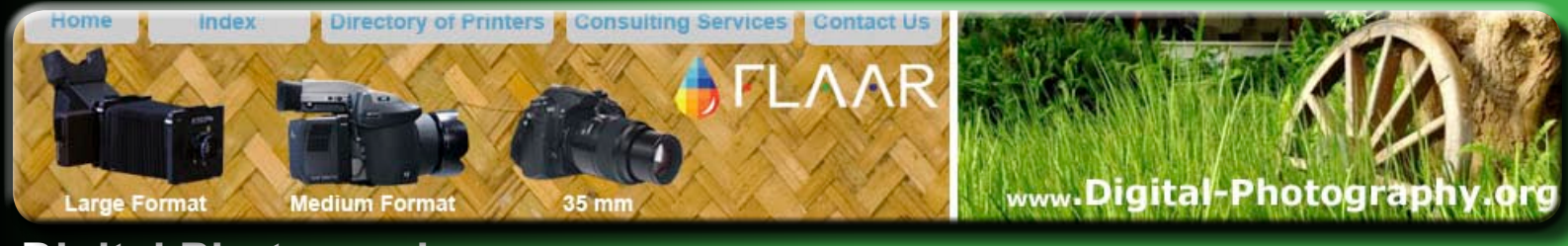
www.fineartgicleeprinters.org

Printing for outdoor use: UV-cured, solvent, eco-solvent, etc.

www.large-format-printers.org

Scanning

www.flatbed-scanner-review.org



Digital Photography

www.digital-photography.org

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.

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Update Policy

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

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

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

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

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

Please Note

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

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

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

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

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

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

Citing and Crediting

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

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

The material in this report is not only copyright, it is also based on years of research. Therefore if you cite or quote a pertinent section, please provide a proper credit, which would be minimally "Nicholas Hellmuth, year, www.FLAAR.org." If the quote is more than a few words then academic tradition would expect that a footnote or entry in your bibliography would reference the complete title. Publisher would be www.FLAAR.org.

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

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Legal notice

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

Advisory

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

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

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

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

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 lifed by cranes and run over a rough pot-holed highway or kept in smeltering heat or freezing cold during shipment.

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

Availability of spare parts may be a significant issue

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

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

Lack of Tech Support Personnel is increasing

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

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

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

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

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

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

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

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

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

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

Be sure to check all FLAAR resources

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

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

Acknowledgements

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

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

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

Besides, it does not take any money to see which printers and RIPs function as advertised and which don't. We saw one hyped printer grind to a halt, malfunction, or otherwise publicly display its incapabilities at several trade shows in a row. At each of those same trade shows another brand had over 30 of their printers in booths in virtually every hall, each one producing museum quality exhibits. Not our fault when we report what we see over and over and over again. One of our readers wrote us recently, "Nicholas, last month you recommended the …… as one of several possible printers for our needs; we bought this. It was the best capital expenditure we have made in the last several years. Just wanted to tell you how much we appreciate your evaluations…."
FLAAR is a non-profit educational and research organization dedicated for over 36 years to professional photography in the arts, tropical flora and fauna, architectural history, and landscape panorama photography.

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

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

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

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

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

We thank MacDermid ColorSpan (now part of HP), Hewlett-Packard, Parrot Digigraphic, Color DNA, Canon, Gandinnovations, and other companies for providing funding for technology training for the FLAAR staff and our colleagues at Bowling Green State University in past years and for funds to allow us to attend all major international trade shows, which are ideal locations for us to gather information. We thank Sun LLC, Caldera, Raster Printers (Rastek), DEC LexJet, DigiFab, Barbieri electronic, 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 Heweltt-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, Mutoh, and Mimaki). This is because piezo has definite advantage for some applications; thermal printheads have advantages in different applications. Our reviews have universal appeal precisely because we feature all competing printhead technologies. Every printer, RIPs, inks, or media we have reviewed have good points in addition to weaknesses. Both X-Rite and competitor GretagMacbeth provided spectrophotometers. Again, when all sides assist this program there is no incentive to favor one by trashing the other. Printer manufacturer ad campaigns are their own worst enemy. If a printer did not make false and misleading claims, then we would have nothing to fill our reviews with refuting the utter nonsense that is foisted on the buying public.

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

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

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

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

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

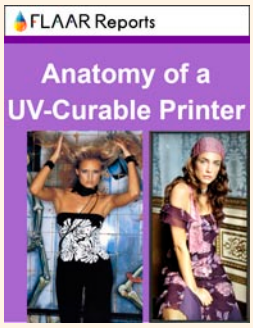
A modest portion of our income comes from our readers who purchase the FLAAR series. All income helps continue our tradition of independent evaluations and reviews of inkjet printers, RIPs, media, and inks.

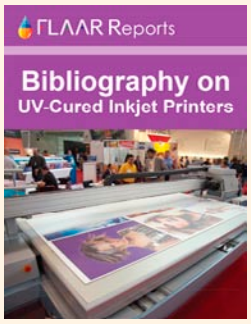
These are some of the most

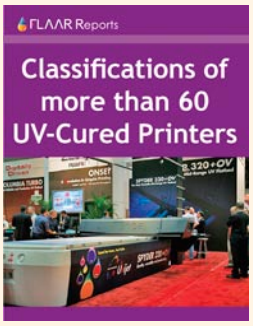
Recent FLAAR Reports (2007-2009)

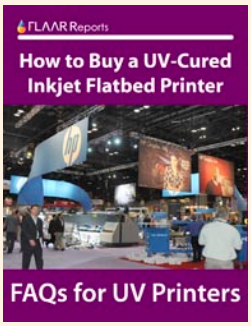
You can find these and more reports at: www.wide-format-printers.NET

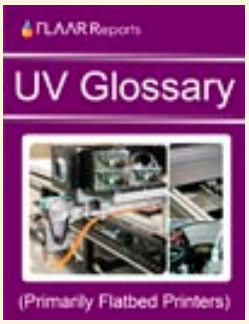
Introduction to UV Curable Inkjet Flatbed Printers

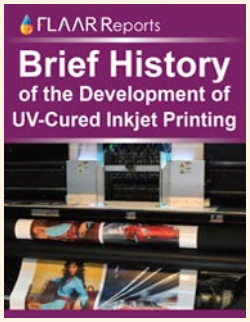


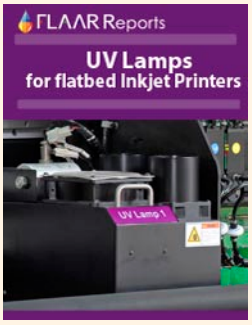


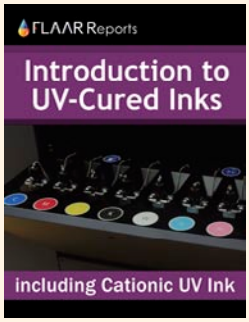












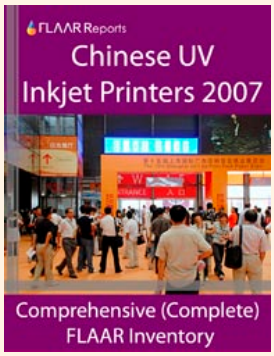
Comments on UV Inkjet Printers at Major Trade Shows 2007-2009

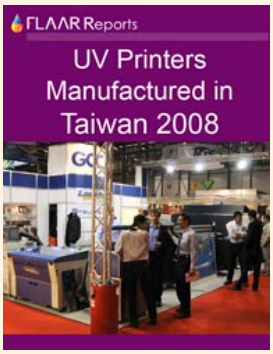
These are some of the most

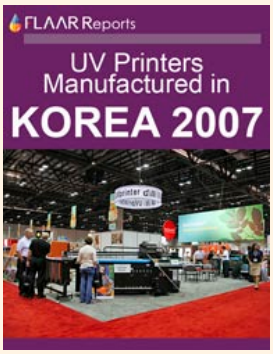
Recent FLAAR Reports (2007-2009)

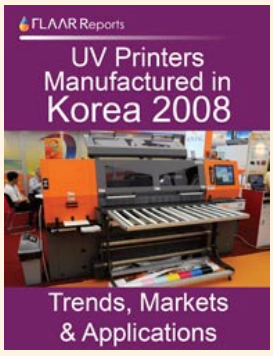
You can find these and more reports at: www.wide-format-printers.NET

UV Printers Manufactured in China, Korea and Taiwan









Most recent UV Printers