FLAAR Reports

Roland SJ-1000
Site-Visit Case Study

Contents

Roland SJ-1000
Evaluation & Review

This interview was conducted with the printer operator who has experience with a diverse range of printers within this thriving sign shop. They have at least four Infiniti solvent ink printers, 3 Challenger (also Chinese made solvent printers) and an Infiniti UV printer (on which we have a separate FLAAR Reports in UV Series).

This company also has a Mimaki CG-75FX vinyl cutter (which they said had software issues). They have a CO2 Epilog laser cutter for wood, glass, acrylics, and other plastics.

Ten years ago we did our evaluations ourselves, in our own facilities at the university. But there is no university that has ventilation for a solvent ink printer (not even for eco-solvent), so we do our evaluations of all solvent and all UV-cured inkjet printers either at site-visits (at a sign printing shop), or at the demo room or factory. For Mutoh we spent and entire week at their European headquarters in Oostende. Four reports resulted (one on eco-solvent, one on mild-solvent (and the differences) and two general reports.

Since no university these days has funding it is traditional to have corporate sponsors. RIT has the most (for its excellent printing programs). The other leading universities also have comparable sponsorship. BGSU itself has none that we are aware of. Since FLAAR already has a sponsorship program, we simply continue this. But when an evaluation has no sponsorship and no project funding, it takes a longer time to complete the project. But even without funding for this evaluation, we felt the site-visit was worth our efforts because there is not really any other outside information available on these printers. And certainly nothing systematic and from an independent resource. To keep our evaluations even-keeled we utilize the same FAQs format with each.

We prefer to have two separate reports on a printer: an evaluation-review based on our general overall scrutiny of a printer, and then a separate site-visit case study. But because there is no specific funding for this report, we wanted to move it along quickly so it would be available. Thus it is a combination of our own evaluation coupled with several interviews with the owner/manager and printer operators. Our most recent inspect of this Roland SJ-1000 was in mid-May, 2007.

1. Name of the printshop?
Perfect Art, Guatemala City, in a strip mall in a busy commercial part of the city on a main street near the turnoff to the airport. Perfect Art also has a second location in the city. This is a busy and successful print shop.

The interview was conducted in Spanish, but I took notes in English.

2. When founded?
This company was founded in 2002 and is thriving today.

3. Objectives of this print shop?
General signage, everything from small billboards, through vehicle wrap to POP. Perfect Art also has an Infiniti UV printer (see separate FLAAR site-visit on that UV machine). They also print with their UV printer on wood, melamine, Formica, PVC, acrylics, glass, banner material, adhesive vinyl, etc.

4. Why did you buy this brand instead of another?
"We already have four Infiniti Chinese solvent printers but we needed something with better print quality. The Infiniti printers are okay for general signage, but some clients want higher image quality. So we bought this printer for its speed and quality of impression."

This sign shop already had previous experience with Roland printers, at least one water-based Roland printer.

5. What are you most happy about?
The print quality. "Yes, plenty content, speed, easy to load (you must load the Infiniti from behind). The text quality with the Roland is better than on the Infiniti." But he acknowledged that the output from the Infiniti was less cost and that for some clients that was more important than the higher quality of the Roland.

6. What was the biggest disappointment?

"Only minimal details were a disappointment, such as different hoses did not hold up to the pressure of the ink."

7. What do you now wish the printer had, that is missing?

"When tensing, it is hard to get the material tense; it is hard to align the material due to the double dancer bar system."

THE BASICS

1. Brand name, model?

Roland SJ-1000.

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

Roland designs and manufacturers their own printers. The headquarters of Roland is in Japan. Roland also makes vinyl cutters, engravers, and musical instruments.

3. What other printers are the same or similar chassis from this manufacturer or distributor?

The chassis looks similar to the stretch models of the Roland Pro II V-series printers.

4. Is this same printer available elsewhere under a different name?

Unless you consider the stretch models with Epson heads as the same printer with a different name, this particular model (in the USA) is not available under a different name. Other models of Roland are retrofitted by SolventJet in the US. Do not confuse this with SolventJet in Europe. In Europe Roland chasses are the most common printer that is retrofitted to make solvent flatbeds, textile printers, and a host of other kinds of retrofitted inkjet printers. But it is almost always the 64" or 7?" Rolands, not the 100" stretch version

5. When and where was this model first introduced?

I first saw this Roland printer at the Dubai Mideast sign show, early 2006.

6. Is this mature, or still in alpha-stage, beta-stage?

Currently (2007) this could be considered out of beta stage. This printer arrived in Guatemala during June-July 2006. I inspected it during January 2007 after having noticed it when doing a site-visit of the Infiniti UV printer in the same print shop during December 2006.

7. List price?

"This particular model was at a trade show in the US in the booth of Tubelight. The printer came to Guatemala and because it was a trade show demo unit, the price was very good."

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

There is an optional Mesh Printing Unit. Naturally the ink goes through the naturally occurring holes in mesh if not backed with a liner. Unlined mesh is lower cost.

Roland SJ-1000 AdvancedJet at Dubai trade show, 2006

Roland SJ-1000 at Perfect Art Guatemala, Central America.

9. Does a complete set of full-sized ink cartridges come with the new printer, or merely a "starter set" that is not as full as a regular set?

You have to pay for the ink separately; no ink comes with the printer.

10. Do you eventually need or wish to buy an auxiliary heater?

Based on comments by the experienced operator of this printer, the ink does not always dry adequately with the heating system that comes with the printer.

11. Is an air suction system needed to be installed as a separate item, or is all the vacuum table or other vacuum requirements already included in the printer itself?

A slight vacuum is generated by fans under the platen, so no outside air compressor is required.

12. Is it recommended, or required, to buy a spare parts kit? Or extra printheads?

The particular company we inspected does not keep any major spare parts on hand. New ones are flown in from Miami when needed.

A Suction fan holds media flat through these area of holes.

STRUCTURE OF THE PRINTER

13. If there is a vacuum function? In how many sections?
A suction fan creates a slight vacuum through holes in the platen.

14. Are their edge guards (media clamps)? At left, or at right, or both?
Yes, there are edge guards at both the left and right to hold down the edge of the substrate so that there are fewer head strikes.

15. Can you move the left guard, or the right guard, or both?
Yes, they are moveable and detachable too.

16. Can duplex (double-sided) printing be accomplished? If so, how difficult is it really?
"I have not yet tried to do double-sided printing."

The best system for double-sided printing that I have seen is the camera-eye system of Gandinnovations. It is so impressive it's worth trying to find it installed at a trade show.

17. Does the printer have leveling supports? How many, and how strong?
Yes, there are leveling supports.

18. Does the printer have wheels? Are they robust?
Yes, the printer has wheels.

Edge guards

The printer is provided with wheels.

ROLL-FED

19. How is roll media fed? Pinch roller against grit roller?
This is a traditional printer: the grit roller moves the material that is pressed down by the pinch roller.

20. Are the pinch rollers same size as grit rollers, or smaller?
Rather small pinch rollers on top of equally small grit rollers.

21. How are the pinch rollers raised as a unit?
There is a lever at the front right.

Pinch Rollers

22. Do the pinch rollers leave a path mark on the media? If so, on all media, or only some media?
The pinch rollers mainly leave a mark when parked on the substrate for several hours (without having the pinch rollers raised). You mainly notice it on glossy materials.

But, "the rollers almost never leave a path, a mark of their path as the media keeps feeding through."

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

24. How is the roll media handled at feeding position? For example, is there a dancer bar?
Yes, there is a dancer bar.

25. At the back, is there an extra roller bar(s) near the platen? 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, there is a "guide roller" actually a pair: one is at the approximate level of the platen.

26. At the front, is there an extra roller bar(s) near the platen? 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).
No extra rollers at the level of the platen at the front.

27. Is there any guide bar or guide line to help align media as it is fed from the back into the printer (under the pinch rollers)?
The operator instructions are meticulous about how to guide (and how not to guide) the media through the complex system or rollers. Roland provides a media gauge to assist one aspect of this.

Spindle

28. How is the roll media handled at take-up position? For example, is there a dancer bar?
Yes, there is both a take-up dancer roller and a feeding dancer roller.

29. Is there a cutter? Is it manual or automatic.
No, there is no on-board cutter, not even a straight edge. Considering that Roland is known for its cutter-plotters, this is clearly not in that tradition.

30. Is there a "knife guide," a slot where you can draw your knife down and across the width of the substrate?
Yes, but like all knife guide slots it is along the front edge of the platen. But this operator has said, so far, the detritus has not affected the printheads that he can notice. But users of Epson printers comment that leftovers from that machine's automatic on-board cutter does include cause head clogging.

Dancer Bar

"Knife guide slot"

HEATERS & DRYER

31. What about heater or dryer? Is there a pre-heater, platen heater and post-heater all three, or just one, or two? How many heaters does this printer have?
At first there only appeared to be a pre-heater and main heater.

As a result, the print shop owner says of his Roland, "At times the ink, especially heavy black, does not dry. It depends also on the material. When the print touches anything, then the ink sticks and the print is ruined (actually both prints).

But reading the spec sheet it lists three heaters:
  • Pre-heater (which almost all solvent printers have)
  • Print heater (which almost all printers have)
  • Dryer (which most have but not all; this is essential)

The Mimaki JV5 has three heaters: pre, main, post.

32. Where are the heaters located? Is heater on top of, or under, the media?
The heaters are all under the substrate, which is the usual position. The fans are over the material.

33. Can you turn them on and off?
Yes.

34. Can you vary their temperature?
Yes, you can vary the temperature of the heaters independently of each other.

35. What about fans?
No fans are evident on the outside but when you get your hands on the operator's manual you see that there is a row of blower fans on top of the media and a drying heater underneath.

There are surely pros and cons of this system. Other printers have no fans but have one additional heater. Fans may blow dust onto the wet ink if your printshop is dusty.

36. Is an auxiliary heater or fan offered, or needed?
"None was offered us." But the operator also said, "Some Chinese material simply does not want to dry."

37. Heat concerns: what heat settings are needed for special substrates?
You need to experiment with heat. Heat, and materials, also vary by ink load. Obviously too much ink is not easy to dry.

UPGRADES, Future Improvements?

38. What firmware upgrades have been made available?
The operator said that no firmware upgrades whatsoever have been offered to him. I am surprised there have been no firmware upgrades available to him.

OPERATING THE PRINTER

39. What is the level of ease of use? Can anyone use this printer or do they have to be trained and certified? What about daily and periodical routine maintenance?
"We got only a ½ day of instruction (on the day of installation). But it's easy to run; everything is automatic."

I would definitely not want anyone to try to load the media who did not have extreme patience. This is not a kind of printer to allow to be run by a person who simply does not care. I am not sure this is a good printer to use if you need to change media often, since loading and aligning the substrate is not exactly easy.

The operators at the inspection site-visit printshop are conscientious and do have to dedicate attention to feeding the substrate properly at the start. Once it's aligned properly, there are not many issues with skew.

40. In the main area for operation, is the machine software based (touch screen), or with physical control buttons? Or both?
Instead of being software operated, many of the functions are based on buttons, such as cleaning cycle. Newer printers tend to have more through the software, but this requires a larger LCD monitor. Larger production computers, such as those of Gandinnovations, have their own computer and keyboard and everything is via the user interface on the monitor (via the keyboard).

41. Do you get an LCD screen in the printer or a real computer monitor? How big is the screen or monitor?
The display screen is miniscule.
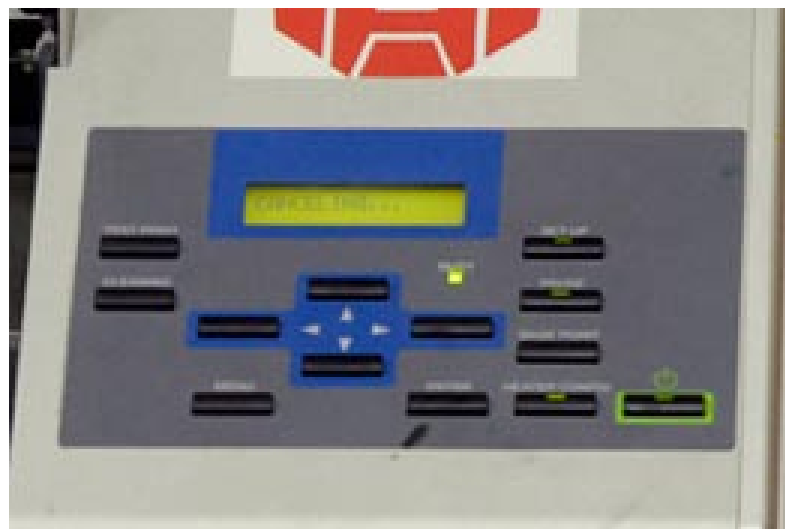
The main control area is located at the far right.

42. Is the position of the LCD screen or monitor user-adaptable?
No.

43. Can you do unattended printing? For how long? How about overnight?
Yes, we occasionally print all night. Sometimes unattended, some other times a person stays to keep an eye on things. If there is a problem it's generally with the material, not with the printer itself."

This Roland model is relatively easy to use. However it requires patience and attention because loading media is not exactly easy.

44. Is there a minimum size for sheet feeding?
There is a minimum size for rolls: 48 inches.

45. How many operators or operator assistants does this printer require?
One person can handle everything except perhaps loading a really heavy roll of substrate.

46. Where does the operator stand or sit?
The LCD screen is at the front far right.

47. What aspects of the printer can you operate from behind (usually the loading area)?
The printer has been intelligently designed so that all key features that require operator interaction are at the front. The main obvious things that are at the back are the
  • Ethernet connection,
  • the place to plug in the electrical cord,
  • the main Off/On switch.
  • Changing the ink to add new ink
You might consider that the waste ink bottle was at the back, but it is also reachable from the side.

But, when we spoke with the operator, he said that you do indeed need to go to the back. You have to go around to the back after you load the roll from the front in order to feed the paper through under the pinch rollers.

48. Is a foot pedal included (for operating aspects of the printer)?
No foot pedal is in evidence anywhere.

The Mutoh printers have two pedals.

CONSTRUCTION (BUILD QUALITY)

49. What is the solid-ness of the construction of the outer body? Is it plastic? Metal? Heavy gauge?
"Good construction quality, except for the front roller that sticks out in front. It has a big dent in it."

50. Is there both a front hood and a back hood?
There is only one hood, at the front.

51. The hood, is it strong, or cheap plastic?
Most hoods allow you total vision to see what is being printed. But this Roland has three thin plastic windows, so you can't easily see inside. The hood is otherwise metal, so relatively strong, especially considering the 100+ inch width of the machine.

52. Does the hood have a frame?
Yes, the printer's hood does have a frame; indeed the hood is more frame than window.

53. Is the frame plastic or metal?
The frame is metal.

54. How would you describe the overall workmanship of visible parts? Clean (Swiss made), or flimsy and uneven (several Chinese-made printers)?
The printer appears cleaner in sense of cutting edges, bolts, screws (assembly) and fitting of parts than most Chinese printers. Korean printers (IP&I and Dilli are the ones we have inspected the most) are much cleaner and better engineered and constructed than Chinese printer. The Roland is Japanese-designed and correspondingly well done.

55. Does the printer wobble back and forth when printing?
"Stable, only a little vibration."

56. After you have used the printer for a while, do screws begin to shake free?
Not significantly; not as bad as a Chinese-made printer. But, "the back dancer-bar did become loose."

With the hood open you can finally see inside; note that the hood itself does not have large windows. But when you look inside, the printer and its parts look well made.

AESTHETICS

57. How would you describe the design of the printer?
It's not designed in Italy but it looks acceptable. It's not an ugly or totally industrial design.

58. Can you easily tell which is the "front" and which is the "back'?
Yes, you can easily tell which is the front and which is the back.

SET-UP OF THE PRINTER: PRACTICAL CONSIDERATIONS

59. What are the electrical requirements of this printer? This means, will the building have to be rewired?
AC 200-240V 50/60 Hz, 10A for both the printer and the dryer.

The printer is 1600 W, the dryer is 2300 W.

60. What kind of exhaust system is either required, or if not required, what would common sense dictate? What system of ventilation is used? Is it adequate to clear the work area of gasses and fumes?
The printer itself does not come with any external ventilation or comparable safety system for VOCs and fumes. This particular printshop only has ceiling vents. Lack of ventilation inside the printshop is typical in Latin America, Asia, and areas without strict laws and with lax enforcement in any event.

61. Are there any special temperature or humidity requirements or preferences of this printing system?
Ideally temperature should be from 41 to 104 degrees F (ouch, that's hot), and relative humidity of 20 to 80%.

"There have been no problems when humidity rose in the tropical rainy season" (summer through autumn in this part of Central America).

62. What is the connectivity? Network, SCSI, FireWire, USB 2, or other?
Ethernet.

Ethernet connection. AC 200-240 voltage is required

63. Does the printer come in one piece? Does this mean you have to remove a wall to get the printer this size into your office?
The printer comes already assembled; a forklift truck was necessary however.

INSTALLATION OF THE PRINTER

64. Can you install this printer yourself?
Installation took only half a day; instruction was the other half of this day. Though in theory you could probably install the printer yourself this would not be advisable.

65. How many manuals are available?
The User's Guide that was kindly sent by Roland (USA) in Spring 2007 is 128 pages long. It is a PDF. But the text is not easily legible on a 15" monitor (yes, naturally we have bigger ones, but this monitor is one way we test if a manual is legible).

66. Which manuals are hard-copy? Which manuals are only on CD?
The User Manual came in English, in hard copy, and is 107 pages long. This must be the version for last year, since the one I received as a PDF in 2007 is a bit longer.

67. What is the rating of usefulness of the User's Manual and other associated materials?
The User's Manual is good. However it lacks any index.

68. Is there a glossary in the User's Manual?
Six terms (jargon) are identified and pointed to on the printer. This is actually more glossary assistance than most other manuals.

User´s Manual

69. What is the native language of these guides? Is the translation acceptable?
The manual does not have the appearance of being "translated" even though it would be natural to assume that Japanese is the original language. The translation, or whoever wrote this, did it well.

The manual is better than those for other Japanese manufacturers, although the manuals for many Mutoh printers is actually made in Europe, so at least the English is not partially Japanese.

70. What kind of cut-away drawings or other drawings exist that show the various parts of the printer?
The user's manual has basic line drawings of the front and back of the printer, but none of either end. But 3D line drawings are frequently used to show where things are located. The graphic design is acceptably done.

TRAINING

71. Is training included in the purchase price? If so, what kind of training is offered?
Since Roland printers are installed by local or regional dealers, or in foreign countries by distributors, training will vary considerably. The amount of training requested by the end-user will also vary: for example, this company, PerfectArt, already has experience with at least four other solvent printers and at least one other Roland printer. So they received a half-day training.

Half a day would be minimalist and for a totally new minimum-wage employee with no prior experience in a solvent printer would be probably not enough. In the US Roland also offers factory training; see further down.

72. Is factory training available?
Roland USA offers training in their demo room, the "Roland University." This is not factory training but close to it.

PRINTHEAD TECHNOLOGY

73. What printheads are used? Xaar, Spectra, Epson, Konica, Seiko or other?
Seiko printheads.

74. What model of the printhead is used?
Since there is no information whatsoever on what brand of head is used, there is even less documentation on what model of mysterious printhead is used.

75. If an Epson head, is it modified from the heads used in Epson water-based printers? If modified, what are the modifications?
This is Roland's first printer without Epson printheads. There are several reasons for Roland wishing to use other heads: first, Epson itself now wants to take over the solvent ink market by marketing its own Epson branded solvent ink printer. Epson must do this to survive, since HP and Canon are obliterating Epson market share in the photo and giclee market of water-based printers.

Second, Epson heads were never really made to handle solvent inks of any kind. This deficiency caused everyone headaches during 2002-2004 until the heads were improved, but still they are slow and still primarily good for water-based inks (even after the improvements).
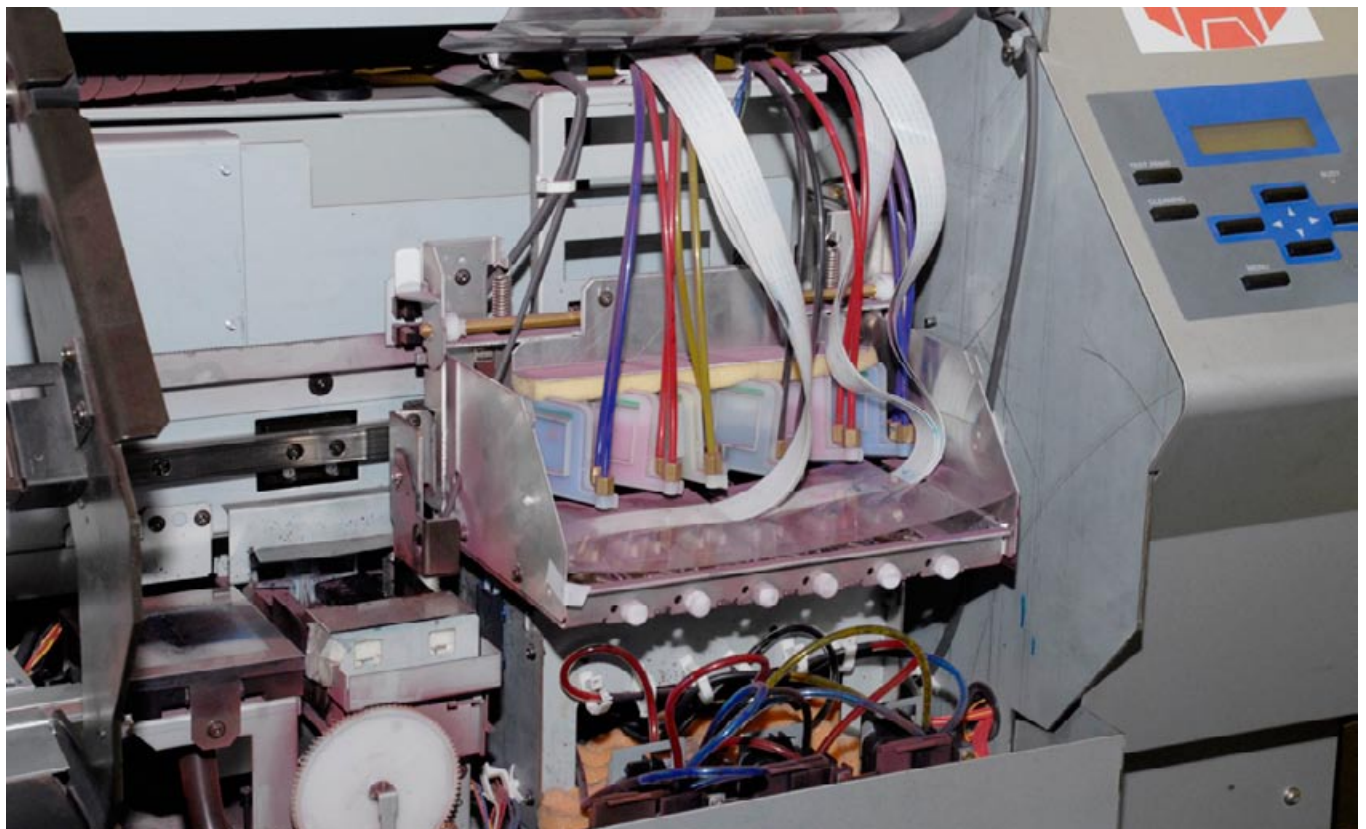
Roland SJ-1000 printhead carrange in capping station (which is the parking area, since it must always be capped when parked)

76. Is the printhead identified in the spec sheet brochure by brand or also by model, or not at all?
When I first saw the printer in Dubai, the pleasant people at Roland there did not want to identify what printhead was being used. So it took me a bit of networking and I got the answer: Seiko.

Otherwise, this head is rarely used, in part because earlier versions were distinctly poor quality (circa 2000-2003). Indeed Seiko itself did not use their own head in their ColorPainter 64S: Seiko uses a Konica printhead. But today's new improved Seiko heads look just fine. Vutek uses Seiko printheads for its newest QS2000 and QS3200 UV printers.

The brand of the printhead is specifically not listed in the spec sheet.

77. Explain the pros and cons of Xaar, Spectra, Epson, Konica, Seiko or other heads relative to their ability to handle solvent inks. If Xaar heads define how long they last compared with Epson or Spectra heads.
The printer operator being interviewed with this Roland SJ-1000 has experience with four Infiniti printers (using Xaar heads) and three Challenger printers. He said about the Seiko heads: "very good, much better than the others. They don't clog, in part because they are better protected."

78. How many printheads per color?
Yellow and Black each have two heads; Magenta and Cyan each have four heads; there are 12 heads all together. The printer operator said there are six "units" each divided into two heads.

PRINTHEAD Positioning

79. Are printheads in a single row, or staggered?
The heads are in a single row.

80. How complex is it to align the printheads? Can the end-user align the heads without tech support?
"To align the printheads we call the service technician, about every three months, depending on usage."

Printheads are in a single row; you can see this in the positions of the capping stations

PRINTHEAD DPI & Print Quality

81. 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?
Advertised dpi is 720 but as with all other printers there is no explanation of whether this is true dpi or not.

82. Do you print at 4 passes, 8 passes?
"Normally print at 4 passes."

"If the client wants better quality, and is willing to pay for it, we print at 8 passes."

"There are a few clients that want us to print at 12 or 16 passes, and they are willing to pay for it."

83. What are the expectations of the various clients that would consider this printer?
Perfect Art bought this Roland SJ-1000 specifically so they could achieve better quality than that available from their four or five Chinese-made Infiniti printers. They like the cheap ink and cheap prices for these Chinese machines, but some clients ask for better print quality and are willing to pay for it.

84. Is the sequence of ink color laydown the same coming and going? (rare). Or is the sequence of colors bi-directionally a different sequence than uni-directional? (the usual way).
Sequence of colors is different; you get sequence the same only on printers that cost multiple times more than this model.

85. Is there a left-right alignment compensation procedure?
You can indeed do a bi-directional printing misalignment calibration.

86. Do you print bi-directional or uni-directional?
You can print either way.

PRINTHEAD Banding Issues

87. Is there banding in areas of solid black?
"There is not much banding in solid black; banding is mainly in solid blues, greens and Corinthian color.

88. How can banding be avoided?
One kind of banding (feeding error banding) can be corrected.

Mutoh has the most sophisticated system to eliminate banding that I have yet seen: Intelligent Interweaving. We have a new FLAAR Report on that innovative technology.

89. Can you vary the material feed rate?
The printer operator was unaware that this was feasible to reduce banding, in general and whether it was feasible on this Roland printer.

Intelligent Interweaving is a new technology to avoid banding issues. This report is already availble at **www.wide-format-printers.net**

PRINTHEAD Life Expectancy

90. 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 Roland user manual states clearly that the printhead is a consumable item, but offers no estimated time for such needed replacement.

91. Do you raise the heads manually, with click stops, or motorized?
Motorized.

92. Does excessive cleaning of the printheads hasten their demise?
Yes, the instruction manual states clearly that using the full-powered cleaning cycle will indeed cause premature head failure.

CLEANING & MAINTENANCE NEEDS

93. How easy is it to access the area where you have to clean the heads?

Rather than simply lifting up, you have to unscrew two screws, take off the screws, take off the cover. It's the same on both sides. Then you have to figure out where to put the cover in a crowded printshop.

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

The printer uses a pump to suck ink out the nozzles. So it's a pull system, not a push system. This happens at the right of the printer.

95. To initiate a purge, where is the control or button? Is it software generated or do you have to press a button? Is the button on the outside of the printer, or inside on the carriage?

This printer automatically cleans its own heads. But to wipe you pour solvent onto a wipe cloth.

Otherwise you initiate a cleaning cycle by pressing the cleaning key (a button on the operation panel area).

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

There are two levels of cleaning the heads: "*normal*" and "*more forceful powerful cleaning*". But if you use the powerful cleaning too often, it causes the heads to wear out prematurely.
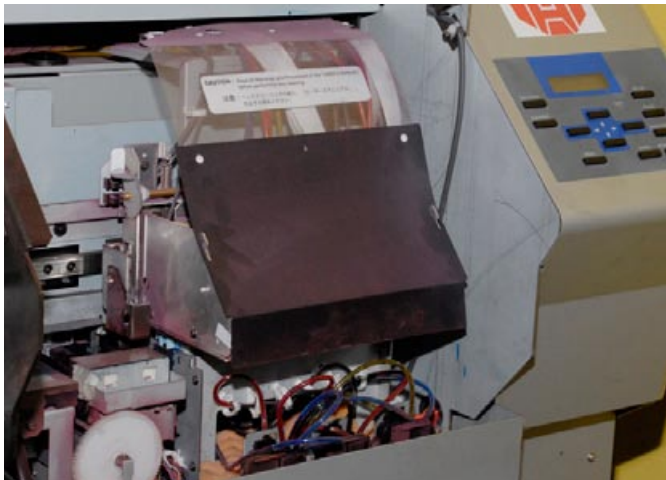
The printhead cleaning area is easily accessible once you remove the hood. But to remove the hood (not shown here) requires taking off two screws.
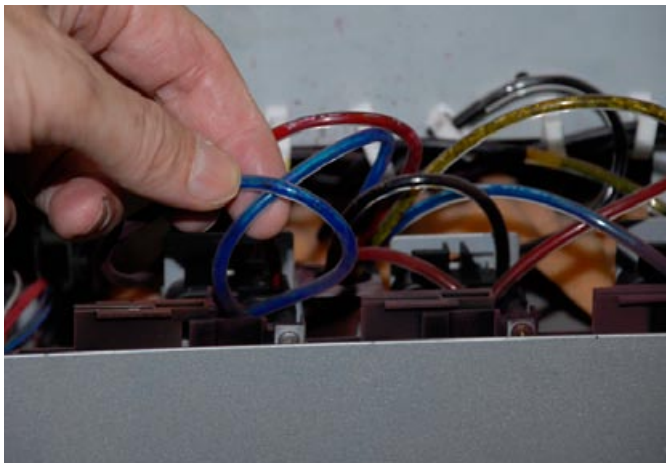
If you don't use the printer for a while, then you need to use your fingers to knead the ink tubes so that you work out (with your fingers) any clogs in the ink lines.

The spitting gutter is the white pad that receives the ink the printhead spits and leads it through a tube into a waste bottle.

97. Does the machine automatically periodically purge itself?

Yes.

98. Is there a capping station?

Yes, at the right.

99. Where is the service area? At the left, or at the right?

At the right; behind a cover. The heads get sucked and wiped here. The spitting gutter (actually it's a white pad) is to the immediate left of the wiping area. The sucking is at the far right.

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

No, the printer parks over the capping station, so that the heads don't dry out.

101. Is there a dip-station that is separate from the parking or maintenance station? Is there an off-printer dip or soaking station for the printheads?

There is a separate "cleaning kit" but this is not an off-printer dip station, it is a set of swabs.

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

Yes, it spits into a flat sponge-like or cloth-covered area. Under this is a drain tube leading to the waste ink collection bottle.

103. Is a liquid flush cleaning solvent available as a separate on-board system? Do you have to manually open and close a valve to let solution flow through a printhead? Is it individual for each printhead?

There is no cleaning fluid delivery system via separate lines, or a manner of splicing any cleaning liquid into the lines (and hence into the heads themselves). Instead there is a "maintenance liquid cartridge" that slips under the service area. You need to occasionally replace this.

104. What cleaning materials are recommended? What is not recommended?

Do not use anything with lint; do not use paper (has fibers).

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

You need to "wipe away grime" from the pinch rollers. You need to brush off the grit rollers. You need to keep the platen very clean.

Do not use alcohol, thinner, etc because the heater will cause the material to catch on fire, or at least to heat up and give off noxious gasses.

You will need to occasionally replace the wiper blades (within the service area).

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

The motors for moving the media don't work; you have to do it manually. Not yet repaired. Otherwise, so far, no other major problems of breakdown.

SLEEP MODE & STORAGE

107. Should the machine ever be turned off? Does not entail having a UPS unit to guarantee it is on all the time?

The printer should never be turned completely off. If completely off the ink will dry in the printheads, causing head failure. So yes, having a UPS unit is a good idea. Even the electricity in Ohio goes off, most recently last month: for over 3 hours.

108. When you go to wake your printer up after several days not using it, what do you need to do that's special?

"Since the ink may begin to dry up inside the ink lines, take your fingers and gently roll the ink lines to get any kinks out of the ink."

SAFETY CONCERNS

109. How much odor is emitted by the ink?
The odor of EcoXtreme is what you would expect of an ink named Xtreme.

110. Is the machine enclosed, or exposed?
The printer is enclosed but has no visible ventilation ducts. Besides, most of the out-gassing comes from the front of the print; not just from inside the printer. So in-machine ventilation only gets rid of part of the odor.

111. What system of ventilation or exhaust system is built into the printer? Or if not required, what would common sense dictate? Is it adequate to clear the work area of gasses and fumes?
Not a peep in the manual about ventilation.

112. Do the printer specs list the noise level?
Yes, this is one aspect of the Roland spec sheet that is a plus and has no excessive claims with fluffy adjectives: they simply state the acoustic noise level 70dB(A) printing, 40dB(A) in standby.

113. How easy is it to access the MSDS of the ink?
It is rare that the MSDS of the ink is easy to obtain. If the MSDS is an auto-download from the company website, this is how it should be. But most companies do not wish the end user to know which brand of ink is being used, so hiding the MSDS is not necessarily an attempt to hide the dangers, but may be to hide the source of the ink.

INKS

114. How many kinds of ink are available?
If you are speaking of official ink provided by Roland, only one kind of ink is available and it would be a challenge to classify because there is no adequate information provided. The MSDS sheets are not included in the user manual. The ink is simply called "Exclusive EcoXtreme ink."

115. Is this a full-solvent, mild or lite-solvent or eco-solvent?
The ink for this printer in the US is labeled an eco-solvent ink but because this is a third generation ink it had to be made much stronger than the first two generations which were too weak. So now some people would classify it as a lite-solvent. A lite-solvent is more or less the same as a mild-solvent. But since no information is provided on the chemistry, and as there is no glossary for the ink, it will take a while to sort this out.

116. Does the manufacturer provide a glossary to help you understand what ink(s) they offer?
The only printer manufacturer that assists you to understand the differences between eco-solvent and mild-solvent inks is Mutoh. That's because they offer both: eco-solvent on the Rockhopper 3 Extreme, and mild-solvent on the Spitfire Extreme. We have both printers.

117. What company makes the inks? Choices include DuPont, Sericol, Sun, Triangle, KonicaMinolta, Tetenal, Toyo, and several others.
The company that brews the inks provided is seldom listed. Since this ink is going through Seiko printheads it does not have to come from the Epson division of Seiko, does not have to be the identical eco-solvent ink as used by Roland, Mutoh, and Mimaki.

Several inks are available: Bordeaux is one. The name on the bottle is Tech Ink, listed as a solvent ink, at about $120 a bottle, which is the price imported into Guatemala.

In the US, the official Roland ink is called Eco-Extreme and costs $199.99 a liter.

Each bottle contains 1 litre of ink

118. How many colors?
This print shop has CMYK installed for slightly more speed. Four colors uses slightly less ink than six colors. But you can opt for six colors if you prefer.

119. Is white ink available? What is the shelf life? Does the white ink need special attention? (Titanium dioxide may settle out if it sits too long). What company provides the white ink?
No white ink is available for this printer, though for a while circa 2005 Roland was showing a white ink, as was Mimaki. But most white solvent ink was not opaque enough.

INK Cost

120. Does ink come in cartridges or bulk?
Ink comes in 1 liter bottles. This is "high capacity" compared to the Epson-type rectangular cartridges but is not high capacity compared with the ink systems on a Gandinnovations or comparable production printer.

121. How do you add the new ink?
Use a funnel to pour the new ink.

122. Where do you add the ink? Front or back of the printer?
You add the ink at the front right if you are using the official Roland cartridge slots. Since this printer does not use Epson print-heads, I don't see the reason for using Epson-type ink cartridges other than that clearly the engineers are used to designing a printer using this style cartridge (so this aspect of the printer is cheaper).

But a true production printer will not use cartridges: look at Gandinnovations, NUR, and all the others. Plus, if you are selling on price, end-users want to use bulk ink.

123. Can you hot-swap ink?

Yes and no, though this encourages you to swap ink before the cartridge is really totally empty. Because if you wait, you get an imperfection in the print where the printer was stopped.

124. How do you see the ink levels?

The operator said "There is no manner to tell when the ink is out. And when it goes out without you knowing in advance, it sucks air into the system."

One cause of this problem is because there is no convenient ink level gauge. You have to manually check for remaining ink, and then press more buttons to get the LCD screen back to its original position. You should expect something more sophisticated on a professional production machine.

Furthermore, the manual honestly indicates "The display shows an approximate guide to the amount of remaining ink, which may differ somewhat from the actual amount remaining."

125. What ink-out alarm system exists?

Yes, there is an ink-out alarm. Traditionally they start beeping far in advance, to encourage you to put new ink in before the old cartridge is really empty. Epson was sued with a class-action lawsuit. This is one of several reasons why we don't recommend Epson-style ink cartridges. Besides, a 100-inch printer should have bulk-ink tanks.

126. What if one purge does not work? How many purges does it take? How does this affect total cost of ownership.

If at first a purge fails to remedy the situation, then purge again. If a normal purge fails, do a powerful purge. If that fails, use the cleaning kit.

127. Where is the waist ink container situated?

When you are standing at the front, the waste container (the "drain bottle") is at the far right, low down on a ledge.

128. How often does the waste container need to be emptied?

"In one entire year have not yet needed to empty the waste container."

129. How do you know when the waste container is full?

When the bottle needs to be drained it puts a message onto the LCD, but, you have to go look for it. Sample problem as with the ink levels. Too much manual clicking on buttons. The status should either pop up or otherwise be accessible at any time without having to go down three levels.

INK: Longevity

130. What about solvents such as cleaning solvents? Do they mar, dull, or wash away the ink or change the surface quality, especially on vehicle wrap?

- Ammonia (in Windex and comparable cleaning liquids)
- Acetone
- Cleaning alcohol
- Gasoline
- Soap and water with sponge
- Soap and water with a broom (frequently used to clean vehicle wraps in Latin America, for example)
- Scotch-tape pull-off test

Nicholas takes notes of ink specifications

SUBSTRATES

131. What sizes of material can be printed on?
The media can be from 48 to 104 inches (2.641 meters).

132. Is width enough for target applications?
Yes, it prints large and small jobs.

133. What is print width relative to roll width? Can you do borderless printing?
Print width is 102 and a third inches; the media itself can be 104 inches wide. So there is no borderless printing at full width.

134. What core diameter(s) will this printer accept?
3" cores are standard for this size printer.

135. How about maximum roll diameter or weight?
Maximum roll diameter is 9.8 inches and maximum weight 100 kg (220 lbs).

136. Front loading, back loading?
Although the machine's design attempts to make the material front-loading, in reality you still have to go around to the back.

137. What is the paper path?
It's a somewhat unusual path since the loading is from the front. But this involves getting a heavy roll fairly far inside the bottom area (the attempt is to avoid having to walk around the back in a print shop that has no available space for rear access to the machines).

Material goes up diagonally and down under (these two are the dancer bar system) then up to the level of the platen (around an auxiliary roller immediately before the platen. Then down around through the dancer bar and onto the take-up roller.

But, you still have to go around to the back to do this (to fit the material onto the back of the platen).

138. What thickness can this printer handle?
1 mm, which is 39 mil.

Media is fed from bottom up into the printer

SUBSTRATES: Issues

139. What materials does the manufacturer recommend to use this printer for?
PVC and FF.

140. Is there a reliable counter of media length remaining?
If you set up the media length at the beginning, there is a rough estimate of media remaining, but it's only an approximate figure.

Image Quality Issues Relative to Applications

141. What about solvents such as cleaning solvents? Do they mar, dull, or wash away the ink or change the surface quality?
A problem with earlier weak solvent inks was that they did not hold up to being washed with alcohol. The new generation inks hold up better to alcohol.

- Windex – Ammonia
- Acetone
- Cleaning alcohol
- Gasoline
- Soap and water
- Scotch-tape pull-off test

142. Is text sharp or fuzzy? What is the smallest text that you can easily read? What about ink splatter, either where a dark color adjoins a lighter area, or with black text against a lighter background?
24 pt text is a bit "shadowy" and not very crisp. With UV-cured printers nowadays you can get 8 pt type crisp and sometimes down to 6 pt type. I have seen 4 pt type on UV printers that is actually rather good. So the quality of UV-cured inkjet printers has caught up quickly.

Applications can be considered high-quality if they don´t involve small text (below 30pt)

143. Is misting observable?

The way you can tell whether your printer has an issue with misting is to put a white napkin inside the printer. See if it turns colors from ink mist landing on it.

Or, look under the media edge guard. If the area to the right (where mist can land) has a faint barely perceptible gray or other light color, that is misting ink that has landed there.

"The second test is what reveals faint misting inside this printer. It is the most observable on glossy vinyl with black ink."
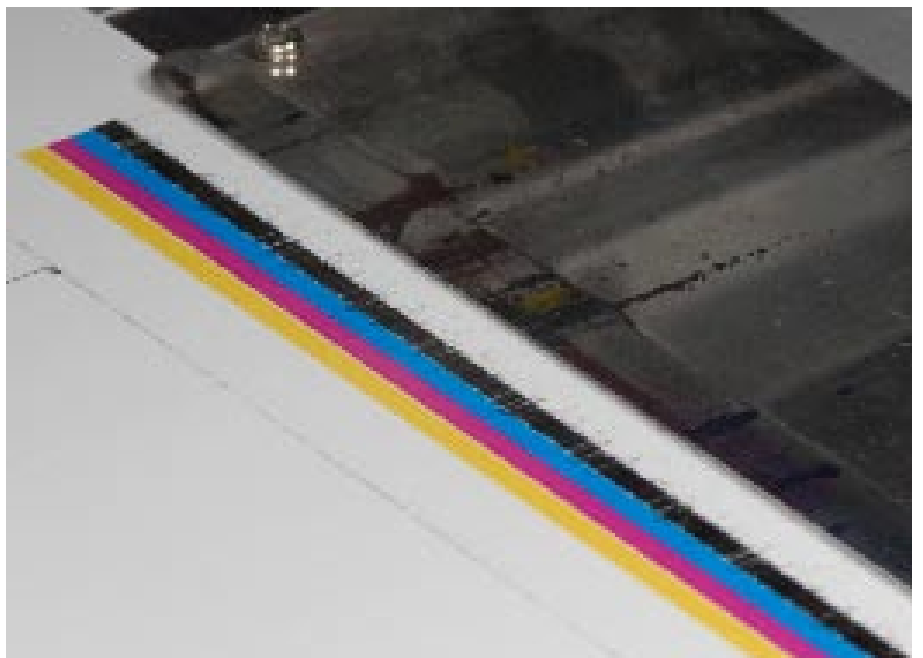
144. What is the longevity outdoors? What about in the full sun in direct sunlight?

The claimed longevity outdoors is 3 years. Real-life testing in full sun, however, is not really available for any of the inks.
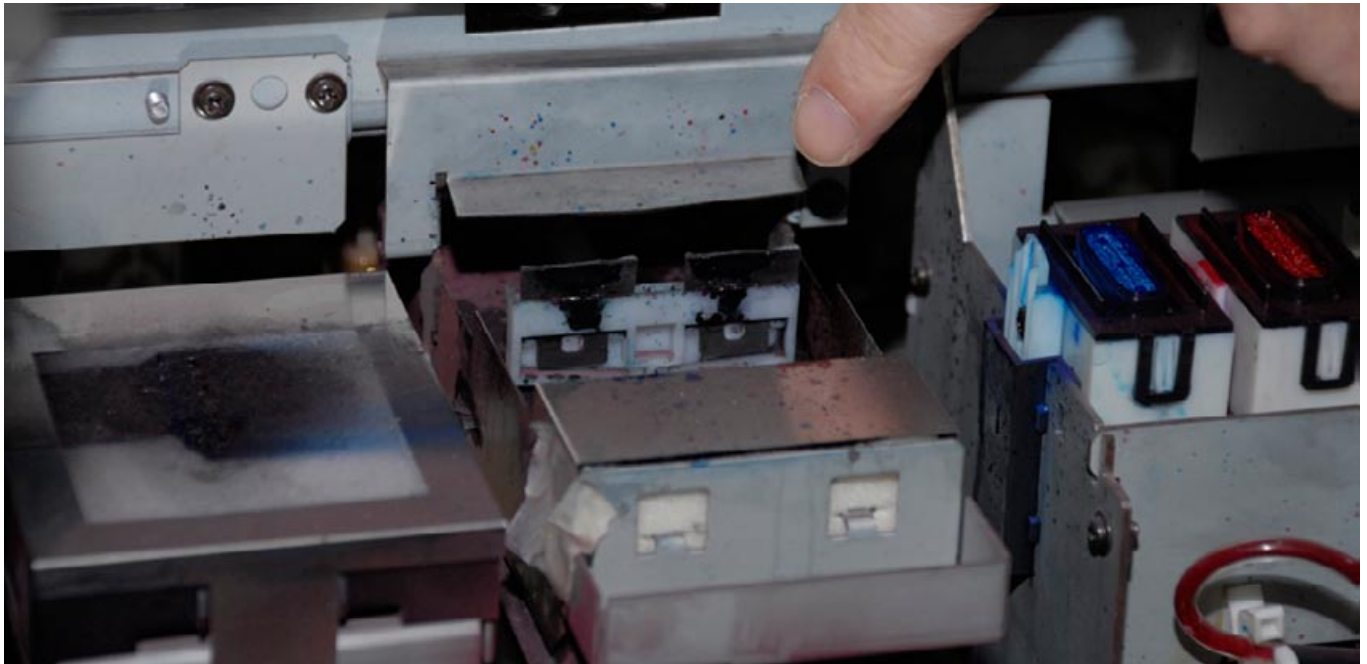
The white area at the left is where the printer spits; there is a tube underneath which leads to the waste bottle

Misting is an issue that has to be taken care of.

PRODUCTIVITY & ROI (Return on Investment)

145. Can this printer hold up to two or three shifts per day all week?

Yes, in the site-visit the operator said that frequently the printer is used from 9 in the morning to 6 or 7 in the night. That two or three times a month he has to run it in night shifts—all night. This requires a tech support visit, however, to grease the rails and really clean the inside of the printer.

146. Does this printer have to be turned off to rest between shifts?

The printer must be kept turned on at all times, but this question asks whether it should be idle or sleep for a while to keep from wearing out. Most Chinese UV printers wear out if you try to keep them printing 8 hours a day each day all week.

ADVERTISING CLAIMS: Anything Misleading? Any Hype? Slight Exaggeration?

147. Please look at the ad claims for this printer in magazines and on the internet.
What aspects of these ads will a buyer of that model soon find out are perhaps slightly exaggerated?
In some ads it seems to be the goal to list as outstanding features precisely where the printer is weak.

It's a nice printer so there is no need to exaggerate with words such as "blinding" as in "blinding speed." I have yet to be blinded by the print speed of any printer other than an offset press. The only time you can speak of blinding speed is with a page-array system of printheads, the kind experimented with on an Agfa :Dotrix and a Sun FastJet.

If you compare the advertisements of Roland with the advertisements for Mimaki printers, there is a notable difference. Just look at each, and you can reach your own conclusions. End-users more and more comment on the exaggeration of some ads.

COMPARISONS WITH OTHER PRINTERS

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

In Latin America the choices may be limited to what is available from local dealers or distributors. In the US and Europe the main competition would be a Mimaki JV5 or even the stretch model of the Mimaki JV3.

Roland and Mimaki seem more popular than Mutoh, in part due to their brand recognition.

CONCLUSIONS

Pros

• Better print quality than a Chinese-made printer such as Infiniti. They then bought three Challengers which had slightly better quality than the Infiniti. Now they bought the Roland to have quality better than the Challenger brand. But they still keep the 3 Challengers and 4 Infiniti printers busy. Each client pays for the quality level that they need.

• "Easy to run, everything is automatic."

• This spitting and cleaning functions do not waste large amounts of ink. This is the most sparse spitting/cleaning ink usage that I know of. The operator has not had to empty the waste container in an entire year.

• The designers have attempted to create a printer that can be handled from the front, since most sign shops in strip malls don't have enough space to allow getting at the back. This installation in Guatemala is in a typical strip mall, and there is not much space for getting behind.

• The user manual has the basics and is in fully understandable English: no Chinese and no Japanese errors of the kind that make other manuals either unintelligible or humorous.

Downsides

• Ink does not always dry.

• The substrate feeding and handling system does not work as easily as might be expected. We heard the same complaint about other users with this issue at FESPA '07 trade show.

• In general the SJ-1000 is a nice printer, but if you compare it's advertising claims with the more moderate statements in a Mimaki or Mutoh ad, you see why the these ads win points for fairness in comparison. The Roland SJ-1000 should be advertised for what it can do; it does not need the exaggerations that creep in to the wording in the ad claims. A printer that is okay (such as this Roland) should rely on its strong points and not use excessive adjectives.

• The operator says there is no ink-out warning system (at least none that is effective in a busy sign shop). As a result, when the ink runs out, it sucks air into the system. From my experience with an Encad printer, getting air out of the system is a real headache. We also heard about the lack of an ink-status information system from other users. It's almost as though someone simply forgot to add this feature to the printer's design.

• Speed claims are unrealistic: "even in its fastest mode" can hopefully produce billboard signage viewed at 100 meters, but not POP quality in a mall. That's why, in Korea for example, the majority of the POP advertisements in the malls are done with a Durst Lambda or an Oce LightJet.

What would we recommend to improve the next generation printer?

FLAAR suggests
• Making the display panel significantly larger, especially so you can see the ink level status at any time that you wish.

Conclusions

"Infiniti solvent printer is cheaper, but the Roland output quality is better."

The owner said that he might consider buying a Roland printer with a cutter, though for the Latin American market, eco-solvent ink itself, and media that accepts eco-solvent ink, may be rather expensive for price conscious clients.

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