



## Nicholas Hellmuth's Helpful Guide to Buying, Using & Maintaining an Eco-Solvent Printer

### FAQs & Secrets





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Caption for cover page:  
 Roland SOL JET Pro IIV eco-solvent  
 printer.

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## Introduction

You can describe this crucial FLAAR Report in one easy sentence. It provides, for the first time, all the Questions that you ought to Frequently Ask When Shopping for an Eco-Solvent Inkjet Printer.

Learning to ask the right question is as important as having an answer. If you don't know what questions to ask of a printer spec sheet, it is all too easy to be misled by clever advertising claims.

The questions here are those that we ask at trade shows and in site-visit case studies. So in effect we are revealing the core of our process in learning the truth about the pros and cons of each printer.

It is nice to have a test print done, but a test print won't reveal what it will be like to have this printer inside your sign shop several months later.

We have included the questions that we felt are most pertinent. However please add your own questions (and answers). Do not rely only on our questions. Your clients may have other needs; your workers may have other experience (or lack thereof). Some media that you use may cause problems we never considered.

Please be sure that you understand basic color management. If you are not yet doing customized ICC profiles in your own print shop, at least learn the jargon. FLAAR offers a complete introductory Series on color management to help you learn the basics of ICC color profiles and color management. You can find all our publications on [www.wide-format-printers.NET](http://www.wide-format-printers.NET).



Mutoh Toucan LT eco-solvent printer.



Mutoh Falcon II Outdoor eco-solvent printer.

## Questions that you ought to Frequently Ask When Shopping for an Eco-Solvent Inkjet Printer

### THE BASICS

1. Brand name, model?
2. What is the nature of the company behind the brand name? Is this company the manufacturer, distributor, or rebranding?
3. What other printers are the same or similar chassis?
4. When was this model first introduced?
5. Is this printer mature technology or still in alpha-stage or beta-stage?



6. How does this model compare with comparable previous printers?
7. List price? What comes with the printer: stand, network connection already installed, take-up reel?
8. What accessories are extra charge? Are these same or similar accessories included with other printers at no extra cost? What other costs are involved?
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?
10. What other equipment is needed to operate this printer? For example, does this printer include its own power line conditioner? Do you need an uninterruptible power supply (UPS)?
11. What is the immediate competition?

### **SPECIFICATIONS: Size, shape, technology, mechanical, construction (build quality)**

12. Is this printer made originally as a solvent ink printer, or is it retrofitted with solvent ink? If retrofitted, what was the original brand?

13. Is width enough for target applications?

14. How is media held flat? Vacuum table? Pressure rollers? Pinch rollers?

15. What are the electrical requirements of this printer? This means, will the building have to be rewired.

16. What heat and humidity limits should be noted?

17. What are the specifications for the supports? Are the supports included or are they optional accessories?

18. 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?

19. Connectivity? Parallel, serial, SCSI, USB, FireWire?

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

21. What is the solid-ness of the construction of the outer body? Is it plastic? Metal? Heavy gauge?

22. 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?).

23. What features are being added, or changed in the next month or so?



Mutoh Falcon II Outdoor eco-solvent printer.



24. What features are being added, or changed, further out in time?
25. Are upgrades modular, or are you stuck buying a completely separate new printer?

## HEATER, DRYER(S)

26. When is heating required?
27. What about heater or dryer? Is there a pre-heater and post-heater both, or just one? How many heaters does this printer have?
28. Where are the heaters located? Is heater on top of, or under, the media?
29. Can you turn them on and off? Can you vary their temperature? What is average monthly electric bill?
30. What about fans?
31. Will you need to buy an auxiliary heater or fan system?

## OPERATING THE PRINTER

32. Can the operator manage print jobs via the Internet with this printer?
33. 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?
34. Can you do unattended printing? For how long? How about overnight?
35. How do you handle feeding objects of irregular size, or small size?

## INSTALLATION OF THE PRINTER

36. What air pressure is required to be provided to the printer? Is this for a vacuum table, or other purposes (such as ventilation)?
37. Realistically, how much surrounding and support space will the equipment need in addition to the machine's own footprint. What space is needed to accommodate not only the printer but everything else to make the printer fit into your workflow?
38. 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?
39. Is installation included in the purchase price?
40. Is training included in the purchase price? If so, what kind of training is offered? What about follow-up training after you have had the printer a month and know enough to ask better questions?
41. What is setup of the printer like? How many people are required for setup? Does the purchase price include sending a manufacture representative to set it up?
42. What is the rating of the usefulness of the Setup Instructions?
43. What is the rating of usefulness of the User's Manual and other associated materials?



44. What other guides, white papers, or other useful publications come with the printer?

## PRINTHEAD TECHNOLOGY

45. What printheads are used? Xaar, Spectra, Epson, or other? Explain the pros and cons of Epson, Spectra, or Xaar heads relative to their ability to handle solvent inks.

46. Is the brand and model of printhead clearly identified in the published specifications?

Printer spec sheets rarely provide the facts about what printhead is used. This is like selling a car but not explaining what kind of engine it has.

47. What other printers use the identical printheads or a model very similar?

48. Do you have to maintain negative pressure on the printhead?

49. How many printheads per color?

50. How many nozzles per printhead?

51. How many nozzles per color?

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

53. What is the true dpi of this printhead? How is this dpi calculated? No tricks or jargon. No interpolation, no software maneuvers. What is the actual base dpi of your printhead, period.

Note to readers: there is no such thing as a 2880 dpi printhead; there is not even a 1440 dpi printhead either. There are also no 2400 dpi or even 1200 dpi printheads either, though we would need to check on that.

54. How do you calculate perceived or apparent dpi instead of true dpi?

55. How many passes can this printer achieve?

56. What is the quality like at one pass? Taking the various speeds that your printer advertises, please explain the quality or defects of the output of your fastest speed? What does the output really look like and is this sellable quality? Is the output at fastest speed junk or throw away, or would a Fortune 500 client actually pay for it and be pleased.

57. What is rated speed at

- One pass
- Two passes
- 4 passes

58. Do you print at 4 passes, 8 passes?

59. Do you print bi-directionally or uni-directionally?

60. How does this company describe photo-realistic? Air-brush photos from a LAC printer are not photo-realistic.

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



62. Okay, taking the various speeds that your printer advertises, please explain the quality or defects of the output of your fastest speed? What does the output really look like and is this sellable quality? Can you please provide references for any company who actually prints at your fastest claimed speed and is satisfied with that output? No fair hiding behind jargon. Is the output at fastest speed junk or throw away, or would a Fortune 500 client actually pay for it and be pleased.
63. For top photo quality mode, is your printer faster or slower than competing printers? How long does it take to print an image 42 or 44 inches wide by six feet long, at your absolute highest dpi and top photo quality setting?
64. What does a normal mortal have to do to accomplish the same high quality output as touted in your ads or at your tradeshow booth? The manner in which a printer's output is highlighted at a tradeshow is not by any means reliable insurance that you too can achieve the same output. Most printer manufacturers tweak the images they show you at tradeshows. Clients bring in images that are only average. So the question is whether the printer can make an average image look great.
65. How much will ink usage and cost rise when you select the higher dpi? Please provide, in writing, the ink usage figures for printing at economy mode (300 or 360 dpi) regular mode (600 or 720 dpi), high quality mode (1200, 1440) and what is the cost increase in ink usage printing at 2880 dpi? I do not mean for "5% coverage," but what are the actual ink costs for 100% of the surface covered with ink at full ink load.
66. 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.
67. If piezo heads fail, who is responsible for paying for replacement heads? If thermal heads, who replaces the heads if they fail before their rated lifespan?
68. What does each printhead cost to replace? Distinguish price for the printhead and also price for the service technician to come and do the installation if it is not user-replaceable?
69. How often can you expect head strikes? What causes them? Who will replace the printheads and at whose cost? Is the failure of a printhead from a head strike covered by the warranty?

## MAINTENANCE NEEDS

70. How is head cleaning accomplished? Spray, vacuum, manual, other? What if one purge does not work? How many purges does it take? If your printer cleans its heads with liquid money (in other words if it uses costly ink to push impurities through the heads), how does this affect total cost of ownership.
71. What daily maintenance is required at start up in the morning? How long does this take? How messy is it?
72. What daily maintenance is required at night?
73. What daily maintenance is required?
74. What other maintenance is required by the operator?
75. What cleaning materials are recommended? What is not recommended?
76. What self-maintenance does the printer do on its own? How often does printer automatically do its own head purge to keep ink from clogging? How much ink is used per month?



77. How much hands-on work is required to set up the ink system? Is hand priming or sucking the ink down the tubes required of the operator? Is head priming automatic, or operator initiated?
78. How much time, media, and ink are used during regular cleaning, calibration, and maintenance?
79. How hard is it to cap the system and turn it off, for overnight, over weekend, while you go on vacation?
80. How long can this printer sit unused without the heads clogging?
81. Does this printer stay on the entire time once it is turned on? Is there a sleep mode? Should the machine ever be turned off? Does not entail having a UPS unit to guarantee it is on all the time?
82. What happens if the heads clog due to lack of maintenance, say over a 3-day weekend or a holiday period?

## TECH SUPPORT

83. Is training necessary? Is classroom training available? Is factory training available?
84. What on-line training is available?
85. What sort of technical assistance is offered by the manufacturer? We mean serious technical assistance. Do your tech support people who answer the phone read from a script and only get a real technician later on? Most manufacturers are cutting back on tech support and/or have people answering the phones who do not themselves actually use or know the equipment first-hand. They just attempt to read from a script.
86. What training does my tech support person have? Is he factory trained? In what language? How many tech support people are available to cover the US (or Canada...)?
87. What tech support is available and for how long? What is the wait time on the phone... truthfully?
88. What is the native language of the tech support person?
89. How do you intend to satisfy a company whose clients need a wide range of true color matching? Can tech support talk users through how to achieve the color of a corporate logo? Or do we have to take an expensive course to learn ICC profiles and color management?
90. What is the original warranty period? What is covered by the warranty? What is NOT covered?
91. What does an extended hardware warranty cost?
92. Who provides the service? The Dealer or the manufacturer?
93. Where are spare parts warehoused?
94. How far does tech support person have to travel to reach my printer?
95. Are dealers national (most companies) or regional (Roland allows a dealer to operate only within a limited regional area)? Do I have any choice in dealers? (How many dealers actually exist in my country?)



96. Who does the repairs? Do spare parts come from a foreign country? If so, what is the wait time for such parts?

## INK

97. What kind(s) of ink does this printer accept? How many kinds of ink are available? Is this a lite-solvent or eco-solvent?

98. What is the chemical composition of the ink? How readily available is the MSDS for this ink?

99. What environmental restrictions exist on this printer's ink in Europe? In California?

100. What other printers use similar or identical ink? If the ink is unique the downside is that few media will be available. Because so few printers use unique inks, not many media companies bother to make a low-cost paper for such a small market. So if you buy a printer with unique ink your media (and ink) costs may be substantially higher over the total cost of ownership.

101. How many colors?

102. Does ink come in cartridges or bulk? How large are the ink containers? What is ink cost per liter (not just per cartridge, but per liter)?

103. What kind of protective devices are on the ink system to keep you from using after-market ink?

104. How much ink is used up during installation of the printer? If a piezo printer, does that mean I have to buy a complete set of ink within a few days of paying off the cost of my printer?



GraphTEC DuoJet eco-solvent flatbed printere.

105. What is ink consumption at full coverage (no unrealistic 5% coverage)?

106. Which color of ink is used up the quickest?

107. Is there any ink color or kind which gives a problem that you don't get with the other color inks?

108. What colors can you achieve easily and nicely?

109. What colors are hard to achieve?

110. Can your printhead technology achieve a solid black black?

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

112. What about printing on backlit? Is your printer as good as, better than, or not quite up to par with, other major printers? Is backlit saturated enough with one print, or do you have to print two and mount them together?



113. Is output splotchy?
114. What about banding? What causes the banding?
115. How long does the ink take to dry before it no longer smudges?
116. At what point can you laminate the material?
117. Can you hot-swap ink?
118. What ink-out alarm system exists?
119. Can you please show me, in writing, the total cost of ownership of your printer. If your company has no total cost of ownership, why not? Surely all the technical people in your company must have figured out what it takes to run your printer?
120. Some printers now have “counters” which report how much ink has been expended for each print. Most printer manufacturers admit that these counters are generic estimates: they do not really count how much ink is actually squirted out the heads. So how about your printer? Does it even have a counter and if so, what is it really counting?
121. Do you need to have a band of printable colors along the edge, outside the main printed area, to keep all printheads and their colored inks fresh and ready to print (so as not to dry out when not be used by the colors in the design)?
122. What is the longevity rating?

## SAFETY CONCERNS

123. Should VOCs (Volatile Organic Compounds) be of concern?
124. What claims does the manufacturer have for health or ventilation? Is the printer enclosed? How is the enclosure vented?
125. 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?
- Note that even trade magazines comment, “Venting—Flatbeds, both solvent and UV-curable, may require the addition of equipment for venting fumes, odors, and particulates.” (Nov/Dec 2004, p. 38, The BIGPICTURE Magazine).
126. What about outgassing of the material after it leaves the printer?
127. Are any other safety or health issues involved? Does the operator need to be concerned with any other safety precautions?
128. How easy is it to access the MSDS of the ink?

## MEDIA

129. What width material does the printer hold?
130. Is borderless printing possible?
131. Is there a minimum printing size?



132. What core diameter(s) of media will this printer accept?
133. What weight rolls of material will this printer accept?
134. What thickness media is accepted?
135. Is printhead height adjustment available? Is it manual, automatic, how much?
136. Can you manually sheet-feed media? Does it feed easily?
137. Is there self-detection of media width?
138. Can the machine handle two different rolls of media side by side at the same time?
139. Does your printing system require nano-porous (micro-porous) media to achieve its rated printing speed (as was the case for the Kodak 5260)?
140. Does material have to be coated?
141. What media will not work well with your printer? What media will not work at all with your printer?
142. What about aftermarket media (brands other than the printer name brand)? HP, Encad, ColorSpan, and Canon can use about any and all media available. Some printers can print on newsprint for proofing) and Kraft paper for artistic effect. What about your printer? Ignore the claim "it prints on a wide range of media." That is just a smokescreen. The real question is, "Can Printer X print on as many media as can Printer Y?" Printer Y is the one that can actually truthfully print on almost everything.
143. Is water-resistant media available both for your inks?
144. How can the cost of media be lowered?
145. Do you have media length-remaining sensors on your printer? Is it manually set or automatic?
146. Front loading, back loading? Paper path?
147. Some printers advertise "two rolls of media" but in fact it is only one roll that can actually be feed. The other bar is merely a storage device. Yet a few printers can switch media from one roll to another with the touch of a button. What does your printer offer?
148. Do you get roller marks or any marks from media feeding on some media? Which media? How bad are the marks?
149. Can the media feed without skew?
150. What about the take-up reel? Does it work unattended? Does media skew when it is wound up?
151. Why might it not be a good idea to let your printer run unattended overnight? What surprises might I encounter if I try to let your printer run unattended overnight?
152. Can your printer detect when one ink chamber is empty? Or will your printer continue to print indefinitely overnight even if one color is empty?
153. What kinds of material ought to be laminated? How often must you laminate?



- 154. How long does the ink take to dry before you can laminate it?
- 155. How much acclimatization time is needed for the media?
- 156. Can duplex (double-sized) printing be accomplished? If so, how difficult is it really?
- 157. Is 3M warranty available? Is Avery warranty available? What are the full added costs in ink, media, and lamination for such a warranty?

## APPLICATIONS

- 158. What applications are claimed by the manufacturer in ads or spec sheets?
- 159. Can you print fine art photos, giclee, or décor?
- 160. Can you print signage?
- 161. Can you print on textiles or fabrics?
- 162. What other kinds of applications can you print?
- 163. What kinds of applications are not something you should try?
- 164. What are preferred applications to print with this machine?
- 165. What applications are possible but mediocre?
- 166. What applications would be better printed on another type of ink, media, or machine?

## PRINTER DRIVERS & RIP SOFTWARE

- 167. Does the price of your printer include a RIP? If a RIP is included or part of a package, is it a lite RIP or a full-featured RIP? Can this RIP be updated or run any other printer?
- 168. Is this RIP fine tuned for solvent ink in general?
- 169. Is this RIP fine tuned for this printer in particular?
- 170. Who makes this RIP?
- 171. If a RIP is included, does it include a computer and monitor?
- 172. If no RIP is bundled with the printer, how many and which RIP brands can work with this printer? What is your rating of these various RIPs?
- 173. If a RIP is bundled with the printer, why might I later wish to add an after-market RIP to be fully satisfied?
- 174. If I might wish to add an after-market RIP to be fully satisfied, then why should I wait? Would it be best to skip the official bundled RIP and go straight to the more fully featured after-market RIP?
- 175. Can your printer function realistically with no RIP whatsoever? If so, what features are missing or slow down without the use of RIP? Is the driver just for PC? What about using this printer with a Mac?

176. Is your printer and/or RIP Pantone certified?
177. Can the RIP perform nesting of various sized files across the full width of the media?
178. If image has to be tiled, can this printer produce accurate sizes that can indeed be tiled flawlessly? Can it reproduce these accurate sizes and proportions all the time, every time?
179. Can the RIP do rotating of any and all files in any and all software? This implies ability to rotate TIF files from Photoshop as well as files from QuarkXpress, PageMaker, or InDesign.
180. Please list the things that a full-featured RIP is expected to do as compared with the RIP that is included with your printer? It would be helpful to know this in advance rather than find it out in practice or note it in some review.
181. Does your RIP form black from K or from CMY? Can the user select which to use or is it permanently locked into one mode in the RIP?
182. If your printer makes black from CMY, is that because your K won't stick to glossy media? This may happen with pigmented inks.
183. What other printers can this same RIP software? Or is this RIP restricted solely to this one printer?
184. Can this RIP be upgraded to run my next printer? If not, why not?
185. How many other RIPs work with this model of printer?
186. Please make a list of those features your RIP does not provide that your competition does provide (irrespective of the price difference).
187. Can your printer function without a RIP with a Macintosh or only with a PC? In other words, are your drivers for PC only or for Mac and PC? Do you get full functionality with a Mac driver compared to a PC driver?
188. Although we tend to use PCs, is your printer equally Mac friendly?

## COLOR MANAGEMENT FEATURES

189. What color management sensors or measuring tools are on-board?

## IMAGE QUALITY CONSIDERATIONS

190. What about type (letters), especially small letters? Can your printer do a nice job: good sharp crisp alphanumeric and line designs? Do you get fuzzy edges even with dye ink, or crisp edges?
191. What about grayscale prints (in easier to understand language, what about black-and-white prints)? Do B&W prints turn out properly grayscale, or greenish or reddish instead of neutral gray?
192. What is the situation with gloss differential?
193. What is the situation with metamerism?
194. Can a glossy finish be achieved? With pigmented ink?



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

196. Can you please explain banding and list five potential causes of horizontal banding? If you need to telephone your tech people please do that now.

197. To what degree does an overheated printhead cause ghosting or parasitic suppression? (This is mainly a problem with thermal printheads after they warm up from printing for a long continuous time. This problem is openly discussed in the Xerox operator's manual.)

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

198. 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 that are perhaps slightly exaggerated? In some ads it seems to be the goal to list the places where the printer is weak as outstanding features. After all, once we buy your printer, we are going to find out about these discrepancies relatively quickly: metamerism on some models; slowness on most models; banding defects; inability to print on after-market media; small ink cartridges combined with high cost of consumables, etc.

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

200. Are any systematic mechanical problems documented? For example, consistent complaints. If you asked outside industry experts would they reply, "Ah, yes, Printer XYZ is known for potential XYZ glitches."

201. What surveys have been done of user satisfaction of your printer? Have these surveys turned up information that a buyer of your printer ought to know about? Copies of pertinent surveys should please be provided. No fair hiding behind NDA.

202. Have there been any recalls of your printer or any hardware or software features that had to be replaced on a notable number of your printers? For HP5000 this would be the yellow sensor; now long ago resolved; for HP 2000-3000 series this would be star-wheel, and so on. For Encad 600 series this would be head failure, for Encad 700 series it would be the skewing problem, and so on. We cover the inherent, systematic problems of printers with piezo-electric heads in the series on Survival.

203. Please indicate the problems in the initial introduction of your printer, between the first ads and/or first showing of the printer at tradeshows? To what degree were early buyers also beta testers?

204. Are there any problems serious enough to have caused either individual or class-action lawsuits to either resellers or the manufacturer relative to color management, mechanical aspects, printheads, banding defects, skewing of media, incompatibility with inks or media or other aspects that could be deemed pertinent? If there were no lawsuits filed, are there any claims or complaints that came close to lawsuits?

**ADDITIONAL QUESTIONS THAT YOU MAY WANT TO CONSIDER**

205. How many of your printer of this model are in use in your country? Not how many are in dealer showrooms, not how many have been "sold" on paper, but how many are functioning in actual use printing signs, posters, banners, textiles, or whatever in commercial establishments.

206. What kinds of companies have bought over your printer models in the last two years? We are not interested in whether Kwik Kopy is on your preferred buyer price list, but rather, how many of Kwik Kopy's x-hundred outlets actually bought your printers in the last two years? Of these, how many were of the model that we are interested in?

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

208. What will the resale value of your printer be in three to five years? Will either the brand name or model specifications cause a knowing buyer three years from now to shy away from your printer or cause a knowing buyer to only want to pay a very low price as compared to the other printers our company is considering? A company which is no longer in business may cause printers of that brand to lose value in the used market. Or is there some major technological breakthrough in your brand that will result in less value for your current model?

209. Are you satisfied with this printer to the point that you would recommend it to someone else?

210. If so, why would you recommend that others buy it?

**Please add your own suggestions**

If you know of any questions we overlooked, please let us know by fax, 419 372 8283

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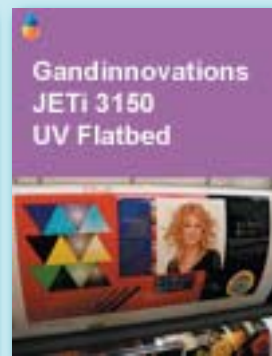
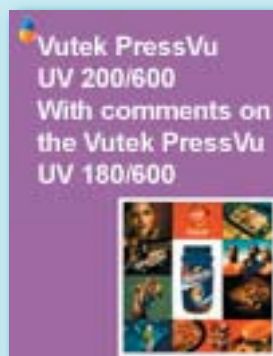
## Top of The Line Production Machines



## True, Dedicated Flatbeds



## Serious Production Machines



## Miscellaneous UV Evaluations

