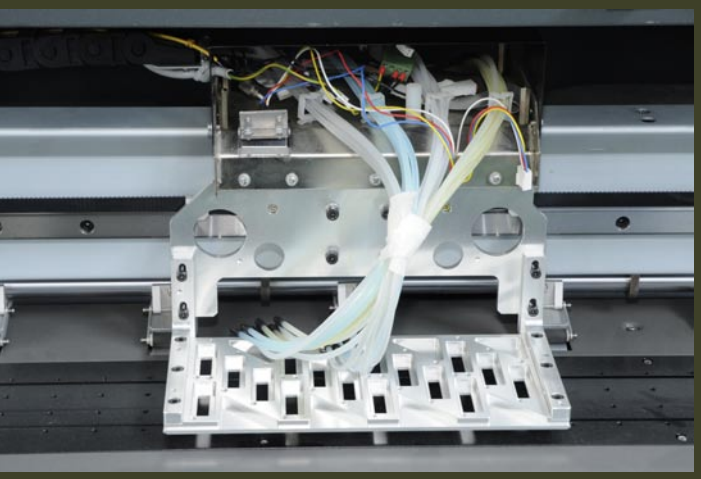
FLAAR Reports

June 2009

Mild or Lite-Solvent, Eco-Solvent, Bio-solvent Inkjet Printers From A to Z



Nicholas Hellmuth

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.

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 form end users.

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.large-format-printers.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.

Contents

True Solvent, Eco-Solvent, Lite-Solvent, Mild-Solvent and Bio-Solvent

"Solvent" Printer Glossary

Introduction

This glossary has been written in order to assist

- All those who come to a FLAAR website to seek assistance in learning
- Sign shop owners and operators, of all levels of experience
- First-time owners of solvent-ink printers
- All those who are thinking of starting a sign printing business

And an increasing category of readers of FLAAR Reports

- People in the digital imaging industry who seek training and education outside their own niche so they can better understand and communicate

Many owners of sign franchises write us asking our suggestions for which printers to select. We especially get e-mails from FastSigns, Signs Now, Sign-a-Rama, and Signs by Tomorrow, but also from other franchises, such as from the Allegra group. They ask whether to stay with solvent or switch to HP latex ink or UV-curable inks. In solvent inks, they ask what are the pros and cons of mild-solvent compared with eco-solvent. A few ask about bio-solvent but that is nowhere near as popular a topic as is latex ink, mild-, lite- and eco-solvent.

From 1996 onward FLAAR had become the de facto source for reliable trustworthy information on water-based inkjet printers such as Canon, ColorSpan, Encad, Epson, HP, etc. We now intend to expand our coverage of solvent, mild-solvent, lite-solvent, eco-solvent, and bio-solvent printers. We undertook major updates to key FLAAR Reports and have issued 10 new titles covering solvent and eco-solvent printers during summer 2004. Now, for 2009 we are commenting on HP latex ink printers such as HP Designjet L65500 and especially lite- and mild-solvent wide-format inkjet printers. A specific project on mild-solvent printers was initiated in May 2009. As part of this on-going project FLAAR staff are visiting printshop owners who have the new Seiko ColorPainter H-104s, H-74s, or newer V-64s printers. While there we are taking notes to update this glossary. So many of the illustrations and examples are based on the new Seiko mild-solvent printers.

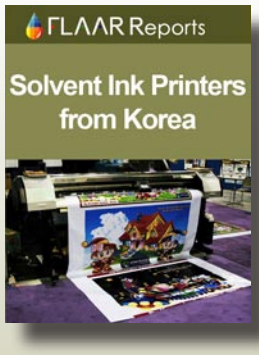
When there is time and funding for comparable projects on eco-solvent printers, we can add more illustrations from Roland, Mimaki, or Mutoh printers, or if there is a future project for bio-solvent we can add more on that hybrid flatbed printer also. FLAAR has a staff of 12 people working on these and related projects, so each program logically needs realistic funding.

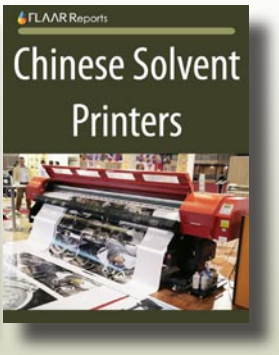
Concurrently we are also working on about a dozen evaluation projects for UV-cured flatbed, hybrid, combo, and roll-to-roll printers such as Durst, Gerber, GCC, WP Digital Virtu and other brands. A separate project started in June 2009 to evaluate the UV-cured liquid coater of Drytac. So FLAAR is expanding, not giving up just because there is a recession.

This PDF is a glossary

This particular FLAAR Report not a review or evaluation, and is not a list of solvent printers other than Mimaki, Mutoh, Roland and Seiko: the top four brands around the world. There are separate FLAAR Reports on all the Chinese solvent printers.

The evaluation of the Seiko H-104s printer will be available later this week





Click Here

To order this
FLAAR Report

To add another term

If you wish to add a term that is missing, please contact FrontDesk@FLAAR.org. If you wish to revise or improve a definition, please write the same e-mail. Documentation, White Papers, PDFs, and other material would be useful in some instances. Please understand that there are several sides to each story: a manufacturer, and an end-user each have their own perspective.

Glossary

Each author of a glossary has their own style. We prefer to not capitalize words in a glossary that are not proper nouns. So Seiko is capitalized as a word that should be, but solvent is not capitalized. So even though the glossary word is the first word in each paragraph, we deliberately do not capitalize it unless it has a reason to be capitalized (other than being the first letter of a sentence)

3M Matched Component System Warranty, If you use specified material, specified ink and printer, and in some cases specified laminate, 3M provides their "Matched Component System Warranty) which is usually 3 years outdoors without lamination, 5 years outdoors if laminated. The MCS covers color fading, loss of adhesion, peeling, cracking or shrinkage. Avery has a similar warranty program for their Avery materials. The 3M and Avery longevity warranties are the best known in the industry and the only ones that are accepted universally.

4-color, a "four-color" printer means CMYK inks. Some printers have eight ink channels so can be two-times-four, which is jargon for two times CMYK. These print almost twice as fast as a mere single-channel-per color CMYK printer. The simple printers are cheaper; the dual CMYK printers are priced a bit more because they are a serious production printer. The better dual CMYK printers can also run "8 colors", so eight different inks (better than dual CMYK for color gamut, but dual CMYK is faster). Seiko ColorPainter H-104s offers both options: dual CMYK for speed and full eight different ink lines for better color gamut.

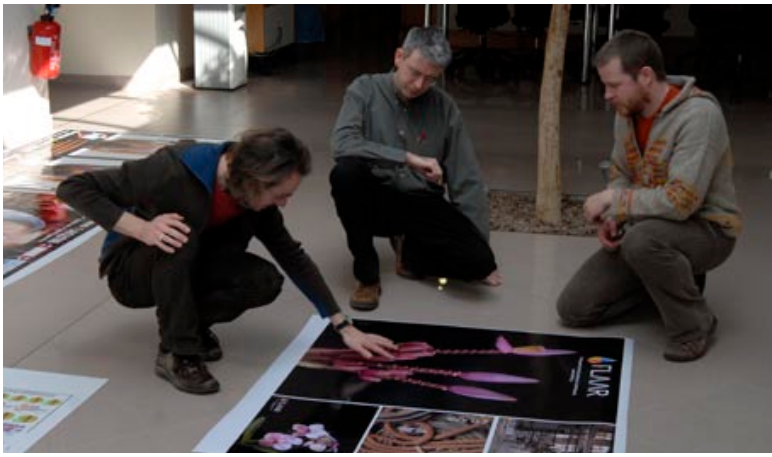
6-color, could be CMYK, light magenta, light cyan, or CMYK Red and Blue (Pentachrome). Other color combinations are also possible, or you can have light black.

7-color, Epson offered CMYK cm and light black in water-based inks several years ago; but seven colors or eight colors were not available in any eco or mild-solvent ink printer until recently. You don't need this level of quality for banners and signage that will be seen only at a distance. But for bus-shelter jobs, and for all POP displays, the more color the better.

8-color, could be dual CMYK. Another option is the fuller range for the VUTEk UltraVu 3360 is CMYK, light cyan, light magenta, light yellow, and light black. Light Yellow is not very helpful; light blacks are a lot more useful, and less cost. Roland had a slightly different version for their HiFi printers circa 2001-2002, but only in water-based inks. Seemingly that color combination was not sufficiently popular since no subsequent Roland printer offered those colors. Mutoh has eight ink lines but only six colors + two cleaning fluids, or else dual CMYK. The Seiko ColorPainter H-104s offers eight ink channels, so you get CMYK lc, lm, gray and light gray. Light blacks of this kind are the best ways to improve output quality.

A

abrasion resistance is a crucial factor in deciding whether to chose full-solvent, mild-solvent, eco-solvent, or bio-solvent. If the surface of some inks is rubbed, scratched, or otherwise abraded, some inks will either come off totally or will show damage. BEFORE you buy, you need to know which inks, which substrates, and which kinds of abrasion or cleaning materials will wipe your image off the sign. Your clients will not be amused if their signage is easily damaged. Just realize that some inks require 18 to 24 hours to reach a better abrasion resistence; in other words, when fresh many inks can be rubbed off quite easily. But in most (but not all) kinds of inks, by the next morning the inks are fine.



Abrasion resistance. Mutoh Europe factory visit 2007.

activated charcoal is the necessary material used in industrial strength air purifiers which are needed if you have a solvent printer in your print shop. There are several main brands, one made in Switzerland and two made in Canada. The SwissAir SolventMaster gas and odor filter air purifier used to be the one associated with Mimaki. But at trade shows in 2004, the most favored air purifier has been purifiers made by Island Clean Air, from Canada. For additional information contact Larry Miller, larry@IslandCleanAir.com

Nicholas at Island Clean Air booth at SGIA 2004.

actuator, a generic actuator is a mechanical device that translates an electric pulse, signal or electronic command into a movement. In the case of a piezo actuator, the PZT ceramic material is actuated by an electrical pulse. The actuation flexes the PZT material which pushes out a droplet of ink. This is the fundamental technology within a "piezo printhead." In other printhead technologies the ink is expelled by an expanding bubble. If you wish to learn about the physics involved and ink chemistry, then attend the pertinent conferences offered by IMI.

airbrush is still a successful and popular way to decorate cars and motorcycles. The website cosmicairbrush.com will reveal how alive this technology is still today. The first VUTEk printers in 1989 used computerized airbrush technology. These air pressure printers use transparent solvent inks that mix in flight before they land on the material. LAC printers still today are the last wide format printers sold in the US that attempt to use this early form of spraying paint with air under pressure. One ad for a Michelangelo airbrush printer claims "flawless continuous tone reproduction of photographs free of pixels, grain, dots, or line patterns." Yet the images I saw at the Mumbai, India sign trade show circa 2001, from a LAC airbrush printer, were the worst images I have seen since I began in 1997. Maybe the ad means that the output is so splotchy that you cannot see the pixels, grain, dots, and line patterns. Think of painting with spray paint can but with an almost endless supply of air and paint. Fortunately the current generation of LAC printers have improved their quality, but they are not acceptable for POP or for anything viewed close-up or in comparison with any Mimaki, Mutoh, Roland, or Seiko mild-solvent printer. The VUTEk 3200i offered 12 dpi! Max dpi in those years was reportedly a whopping 18! The other meaning of airbrush is the traditional airbrush that was used to retouch photographs by hand. Adobe Photoshop software offers an airbrush tool.

aggressive, a beneficial feature of true solvent ink, namely an ink chemistry that aggressively eats into the surface of vinyl. In order to insure adhesion and therefore abrasion resistance, you want the ink to attack the vinyl and bond within the structure of the vinyl. This is encouraged by pre-heating the vinyl. See also non-aggressive

announcement date, is the day on which a new product is "announced." There is also often a separate launch or launching date. But the only date that counts is the shipping date, the day on which, supposedly, the printer will ship. Of course if the product is vapor ware, or a printer that has serious deficiencies, these dates cause embarrassment for the manufacturer.

applications for solvent ink, are nicely distinguished by VUTEk.

- Flexface billboards vs pressure sensitive billboards
- Soft sided truck material vs hard sided trucks
- Transit shelter (usually translucent)
- Photo imaging vs high quality photographic (distinction unclear)
- Short run POP vs Long run POP (ramifications not specified)

But today there is no need to spend a quarter of a million dollars for vehicle wrap, transit shelters or any POP signage. When I visited GDS printing company in Illinois, they were doing vehicle wrap and point of purchase signage with the Seiko ColorPainter H-104s. FLAAR offers its own list of signage applications as Appendix A. Solvent ink would be appropriate for any applications on this list that are outside or otherwise in the sun, such as on windows.

Seiko Color Painter H-104s vehicle wrap at GDS site visti 2009.

Aprion, a company in Israel that made a unique printhead first shown at DRUPA 2000. The acronym of the technology used is called M.A.G.I.C. Aprion was bought by Scitex Vision; then HP bought Scitex Vision. One of the few printers that uses this printhead is the CORjet, made to print high quality images on corrugated cardboard packaging material. Although Aprion printheads do not use solvent ink, these grand format industrial-sized (million dollar) printers are an alternative to solvent ink printers when you need to print on cardboard. A competing ink technology for printing on packaging materials would be the FastJET by SunChemical. This printer was shown at DRUPA 2004; the FastJET uses UV-curable ink. Unfortunately this FastJET at DRUPA 2008 was stated to not really be fully finished (quote, unquote from them, not me), and costs three million dollars.

Scitex Vision CORjet, 2006.

AquaVinyl, a PR name for Encad's unique pre-heating for vinyl, using a special ink from DuPont (but not actually a mild solvent or eco-solvent). This DuPont ink required massive heating. Some ink chemists have suggested that HP latex ink is, to some degree, a further development of the Encad VinylJet concept. AquaVinyl was marketed by Encad as an aqueous based ink. Kodak worked hard to promote the Encad AquaVinyl concept in 2003, but the printer, its atypical ink, and Kodak's inability to survive in the world of wide-format printers caused the demise of the AquaVinyl DuPont ink. A few years before, 2001, Kodak introduced its ill-fated water-based 5260. That printer failed totally because of immature printheads, lack of experience within Kodak of the reality of wide-format printers. Both these Kodak/Encad printers won industry awards. Why? The Kodak 5260 was non-functional, a combination of endless mechanical and ink problems. The VinylJet was unfortunately a failure. So why do sign industry PR agencies give such inadequate printers the top awards? Hmmm.

Arlon booth at FESPA 09.

Arizona, a brand name, or really nowadays as model series of Oce. The first Arizona printers were made by Raster Graphics. Gretag Imaging bought all Raster Graphics company, so inherited the printer name Arizona. Oce then bought all Gretag Imaging printer lines, including the Arizona model designation. Arizona models go back to the 1990's, and were still available as late as 2003, such as the Arizona 30s, probably the oldest continuously manufactured printer that is still available today (or at least was still available up to 2003).

Arlon is a large well-known source for pressure sensitive vinyl graphics films

Avery is also known as Avery-Dennison, a giant corporation that makes everything from labels, inkjet photo paper, markers and highlighters to the pull-off postage stamps. Avery substrates tend to be considered as premium materials. Their Avery Dennison Graphics Division North America products includes white calendered vinyl to print on and overlaminate film. Avery has a Graphics University.

Avery booth and some media samples at ISA 08.

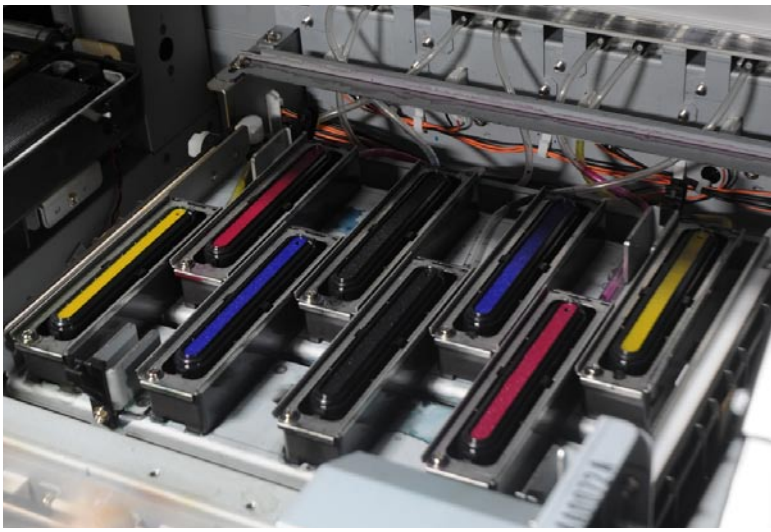
B

buddy jets are the nozzles that are used to replace a nozzle that is defective, jetting at the wrong angle, or clogged. This kind of replacement can only happen if the printhead has enough extra nozzles and/or if the software can detect the defective nozzle and utilize another nozzle to compensate. The slang buddy jet was used primarily by ColorSpan for their Ricoh printheads.

C

capping, putting a cap on a printhead to keep the ink from drying out and thereby blocking the orifice. Capping is usually done at a service station. Solvent ink printers prefer to be kept running constantly but many models can be capped for over the weekend. Mild-solvent printers tend to also include a capping station. Eco-solvent printers do not have as much problem with the ink drying out at the nozzle plate. So the stronger the ink, the more likely it is to clog the nozzles.

cartridge. Most printers that use Epson printheads are required by Epson to use ink obtained through Epson. Epson does not make the ink but sells it, in effect as part of the fee for using Epson printheads. This ink has traditionally come in rectangular cartridges of 220 ml. Since Canon, Encad, and HP have larger ink supplies, today most print shops would consider these Epson containers as far too small (and hence too expensive). So then Mimaki and Mutoh began experimenting with 440 ml cartridges. Epson wants to avoid using bulk ink systems, for fear that people will use more economical ink from competing companies. With Encad printers (that use bulk ink to begin with), “cartridge” means the Lexmark printhead and the ink feeding system that is directly connected to it. For the Encad-Lexmark printers the full term is “inkjet printhead cartridge.” You can buy them with, or without, ink. Unfortunately the cartridge system does not use all the ink inside the cartridge, so end-users pay more money than what they receive in return. I have read about one person who made lots of money collecting old Epson ink cartridges and draining and then using the left-over ink. I have visited one giclee atelier who also breaks open his cartridges and drains out the ink that otherwise would be wasted. Thus I fail to understand why Mimaki and other companies use such a potentially wasteful and definitely archaic ink delivery system. The Epson ink cartridge system is sufficiently iffy that since 2008, not even Epson uses these old-fashioned 220 or 440 ml cartridges any more in some of their newer wide-format models.



Seiko Color Painter H-104s capping station.

Seiko Color Painter H-104s ink cartridge.

cleaning station, printhead cleaning station, also called maintenance station is where the heads spit (purge) and are wiped clean. You can usually see the residue in this service station. In some cases this may be where the heads are capped but usually the capping station should be separate, often on the other side of the printer. Traditionally the service station is on the right side.

cleaning time is the amount of time you have to manually clean your printer (Arizona brochure suggests 15 minutes per day). The principal times you might wish to, or definitely need to, clean your printer would be in the morning before starting and in the evening after finishing for the day. Of course if you clean in the evening and your machine spits on its own, automatically, all night, you may be able to start up the next morning with less cleaning needed.

coated material is any substrate which has been precoated with an inkjet receptor coating. Although water-based ink requires these coatings solvent ink is supposedly, in theory, not to need coating. The coating of the materials is very very costly. But the first generation of eco-solvent inks (2001-2003) did not adhere well to raw vinyl or other materials. So buyers, who were promised cheap uncoated media by alluring ads, felt defrauded and demanded their money back. The backlash was sufficient that the ink labs and printer companies scurried around to develop a more aggressive ink. By late 2003 this new ink appeared. Although it still does not adhere as well as full solvent ink, it is good enough so as not to be a public embarrassment. See also uncoated material.

coater, as compared and contrasted with a laminator. Lamination in the past tended to be a physical layer of film, but it can also be a chemical that is released from the film (and then the physical film layer is removed). A good example of a coater would be from Drytac, their new UV-cured liquid coater. A coater gives a surface gloss, either satin or full gloss (depending on how thick you apply it, and what chemicals are in it). A coating is not the same as a lamination. Lamination may provide some protection against sunlight.

collet, the parts at the end of the spool that help hold the roll of material onto the spool. See also spindle.

color stripe, also can be thought of as a color bar: when you used old-fashioned solvent ink printers such as the early Arizona 30 and possibly the Arizona 90 and 180, your image had to have a color bar along at least one edge so that the printheads jetted out some of each color every so often. This was especially

DGI PolaJet cleaning station at SGIA 08.

DRYTAC VersaCoater-XL at GDS site visit 2009.

needed if the sign had lots of white space or just one color. Because white space means that none of the printheads will be firing. This means the ink will be drying out and clogging the nozzles. Today modern printers have an automatic spitting system: at the end of each pass every color spits at least one drop out. In the old days a comparable effect was achieved by having the printer spit directly onto the sign (off the image to one side in a CMYK color band parallel to the edge of the material). Some printers offer both spitting and the color strips. You can get the color strip to print via your RIP software. We are not talking about a spit, purge, and wipe routine (which is something else even more crucial). The color bar has to do with a pass by pass preventative maintenance system. The color bar discussed here is not to control color proofs or to use in color management. This color bar is also called a spit routing or gutter.

Here you can see an example of a color stripe produced by the Seiko ColorPainter H-104s mild-solvent printer.

compressed air, the better solvent ink printers have onboard compressed air systems.

conformable material conforms to rivets and other hard-to-cover areas for vehicle wrap. Since the last few years there is now also material from 3M that conforms to brick walls and rough concrete walls.

connectivity with an inkjet printer means what kind of cable(s) can you connect your printer and your computer or RIP server. Your options, among others, are parallel (IEEE 1284), SCSI, USB, or FireWire (IEEE 1384).

Connectivity DGI solvent printer at ISA 08.

conversion, converting a water-based printer to solvent ink. Between 2001 and especially in 2002-2003, many companies were convering water-based Roland printers to use solvent ink (eco-solvent, mild-solvent or full-solvent). It was, in many cases, a quagmire of endless issues and unresolved problems. Not too many of these conversions had a good reputation. Because you can't really fully "convert" just by adding a heater. Of course at first it appears cheaper to convert than to buy a true eco-solvent or mild-solvent printer, but it would be tough to recommend any conversion. It took Roland several years to convert their own printers and they have million-dollar resources and years of manufacturing experience (though no experience with solvent inks when they first made the transition). Today (2009) Roland eco-solvent printers offer nice quality and all the ink lines and internal parts are acceptable for the kind of solvent ink running through them.

cyclohexanone, often spelled cyclohexanon, is sometimes listed as a neurotoxin,. The best web site I have found so far on this remarkable chemical is www.jtbaker.com/msds/englishhtml/c7051.htm. They list the chemical formula as C6H10O. If you presently use a solvent ink printer, you will find this web site fascinating albeit morbid.

Cyclohexanon-free; cyclohexanon is the ingredient in solvent ink, which, if you value your health or worry about your co-workers, that you do not want in your home or office. Some mild solvent inks such as for the Seiko ColorPainter 64S are supposed to be cyclohexanon-free. Most eco-solvent inks are free of cyclohexanon.

D

dampers, seem to be a part of some brands of eco-solvent printers that get gummed up and frequently need replacing.

dancer bar is not for lap dancing or dancing up on the bar, but is a long rod (tube) that can move (hence the term dancer); can move freely to help moderate tension in feeding roll-fed media to the printer and in theory on take-up position as well.

decap a printhead, take the cap off or move the printhead carriage off the capping area, which may, or may not be, the same as the service. Decapping can be manual or automatic.

D.G.I., a Korean company that makes solvent printers. The owner of D.G.I. is the brother of the owner of Dilli.

digital screen press is moniker used in an attempt by wide format printer manufacturers to speak to screen printers, to make inkjet printers sound simultaneously like a printing press and a screen press. Of course they are not really either. Several company's ad campaigns have used the digital screen press concept, most notably Gretag, who owned Arizona before Oce. Their Arizona 30 has been called the "Arizona 30 digital screen press." Oce continues this moniker on occasion, as in "Arizona 180 Digital Screen Press." VUTEk has named several of their UV printers as digital presses.

diode, the ColorSpan 72s has a Colorimetric photo diode (and an image sensor) on board. These electronic devices are to assist in on-board color management that is coordinated through the dedicated ColorSpan RIP. No other solvent-ink printer under $150,000 has such a color management system on-board.

draft mode is the fastest that a wide-format printer can print and still produce a recognizable image. Generally draft mode = unusable output. The problem is that the manufacturers tout the draft mode as the actual printing speed. Then elsewhere in the spec sheet the manufacturer talks about the high dpi and fabu-

Seiko ColorPainter dancer bar at FESPA 09.

D.G.I. PolaJET solvent printer at Dubai 09.

lous quality the machine can produce. BUT, the manufacturer studiously neglects to tell you that you will never get the draft mode production speed together with the full dpi. So draft mode speed is, in most printer advertisements, a good example of bait and switch. See also production mode and quality mode.

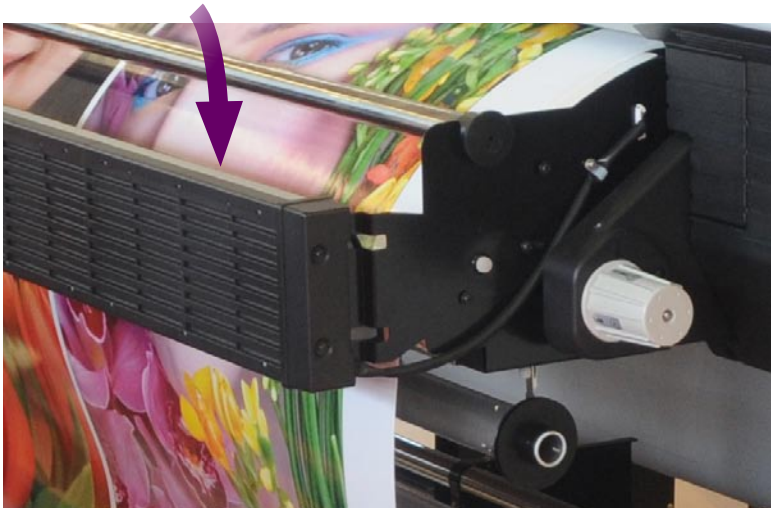
drop volume or drop size both mean the same thing, the size of the main drop which is jetted out the nozzle, measured in picoliters. See also variable drop.

drying system, may be a "post" heater or a row of fans or conceivably both.

dry to the touch means that the ink does not smear or rub off but is still easily scratchable. Plus being dry to the touch does not mean you should laminate the ink, as it is not really complete dry on or inside the substrate. In many cases you need to let the ink dry completely, either 24 hours or at least overnight.

duplex printing means printing on both sides of the material. Practically no 54-74" solvent ink printer and rarely any water-based printer can print, automatically, on both sides. But pole signs and other banners may need to be printed on both sides. Thus there are some specialized 3-meter solvent printers that can print first one side and then automatically feed the other side, to print the other side via register marks.

dye solvent ink seems a contradiction of terms. It is generally assumed that solvent ink is a pigmented ink.



Seiko H-74S drying system at Fespa 09.

Nicholas with Dr. Wang at InkWin solvent ink lab 2008.

dynamic variable drop imaging technology. Although Roland is usually credited with introducing variable drop sizes we tend to forget that the Iris 3047 proofer had variable drop sizes for years before that. Variable drop size is what gave the Iris its advantages as a giclee printer. Lexmark offers variable drop size printheads so I don't understand why Encad could not produce variable drops. HP and Canon thermal printheads are not capable of spontaneously varying the drop sizes. They can produce more than one drop size (in theory, but not yet in practice) by having different nozzle configurations on the same printhead, but chose, so far, not to do this. Mutoh and all clones of Mutoh (Agfa, Gerber, Spandex, Sign Warehouse/PrismJET, etc) call their drop sizes "dynamic variable drop." Roland and Epson have essentially the same system but use a simpler term, just "variable drop."

E

eco-solvent is a made-up name that attempts to make nasty solvent ink more socially acceptable. Eco-solvent ink (and most mild-solvent) must lack cyclohexanone to be called eco-solvent. The idea is that with no or minimal VOCs, with less offensive odor, that people will think the ink is okay for the environment and for your health. I am not sure that most people would allow eco-solvent in their home or next to their own desk. A manager might okay one of these printers for elsewhere in

the building, but having one in his or her own office printing 5 or more hours a day all week: not many. Seiko prefers to use mild-solvent ink in part because their ink is stronger, and in part because Seiko points out that these inks are not as warm and cuddly as ads try to make them out to be. Mimaki realized that the first generation of eco-solvent inks would be a disaster, so Mimaki USA essentially refused to offer the JV-2. Only since 2004, does Mimaki offer a mild-solvent, but it has not yet been used as much as the HP 9000s and all the original and subsequent Seiko ColorPainter printers. FLAAR recommends that work spaces with any form of solvent printer, whether eco-, lite-, mild-, or bio-, that they have adequate ventilation. An Island Clean Air charcoal filtered air purifier is another accessory you should consider.

Please realize that it is not our fault that early versions of eco-solvent inks and ink delivery systems did not work as advertised, and required costly coated media in those early years. Eco-solvent ink, and printers, have produced excellent quality for the past several years since then. Mild solvent ink has worked well since 2006.

But with a background in history, it is always useful to put things in perspective, since many printers from 2001-2004 are still being sold used on eBay. Our comments on these early printers are so printshops are wary about buying used printers and even more careful about upgrade kits still offered today. It is safer to consider a current model Mimaki, Mutoh, Roland or Seiko printer if you want a serious solvent machine: eco-, lite-, mild, or full-solvent.

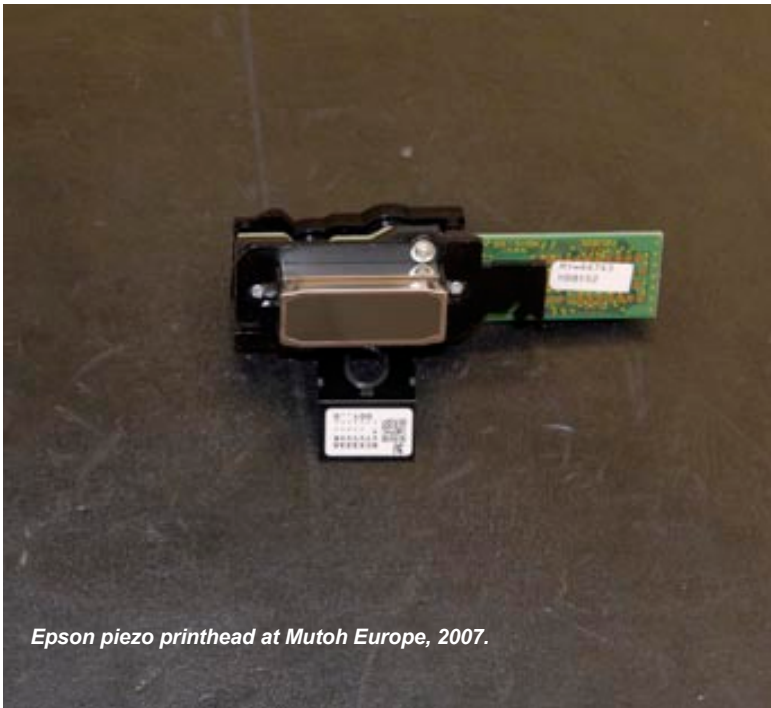
eco-solvent plus is the hurried replacement in 2003 for the first generation of eco-solvent inks (2001-2003). The first generation used by Roland and Mutoh got a quick reputation for being incapable of providing anywhere near the level of capabilities that the ads so loudly claimed. Eco-solvent ink was not judged as acceptable compared with what the ads claimed until the third generation. This and the fourth generation inks are okay, but most ad claims are still a bit too much. But the printers and ink are fine for what they are.

edge guard is a horizontal piece of metal that holds down the edge of the material being printed on, in the hopes to avoid head strikes, at least against the edge of the material.

environmentally friendly inks is a term dreamed up by clever managers and PR folks to bamboozle sign shop owners and printer operators into not looking too close at the MSDS. Any ink with dyestuff or the chemicals needed to handle pigmented color is unlikely very friendly to growing organisms. The ink used on cookies and cakes is the only ink I would eat, and only for photo opportunities.

Envision Inks evidently related to the after-market SolventJET conversions offered by Ahern & Soper, All Graphics Supplies, NIDI Technologies, and Splash of Color (TheBigPicture magazine, Jan/Feb. 2002, p. 10).

Epson piezo printheads were designed for using with water-based inks. The solvents in solvent based inks may either dissolve or corrode early models of these printheads, or dissolve or corrode connections in the ink line which will bring dissolved or corrosion remnants as minute debris to clog the heads. The degree to which mild solvents and eco-solvent ink causes comparable degradation of Epson printhead life has not been established but is less an issue today in 2009 since Epson printheads are now made knowing in advance that they will be used with eco-solvent inks.



Epson piezo printhead at Mutoh Europe, 2007.

extended gamut means more colors than a "normal" gamut. There is no accepted industry definition of extended gamut or normal gamut either. A company that claims an extended gamut is usually trying to show how their inks produce a wider range of colors than their competition.

F

feeding, media feeding system is the mechanical devices that move the substrates through the printer. Roland, Mutoh, and Mimaki use a straight-through media path, with the media loaded and fed from the rear. Encad has a comparable system. HP, in distinction, has a torturous route in order to maintain better control (less chance of skew). Encad had a reputation for media skew.

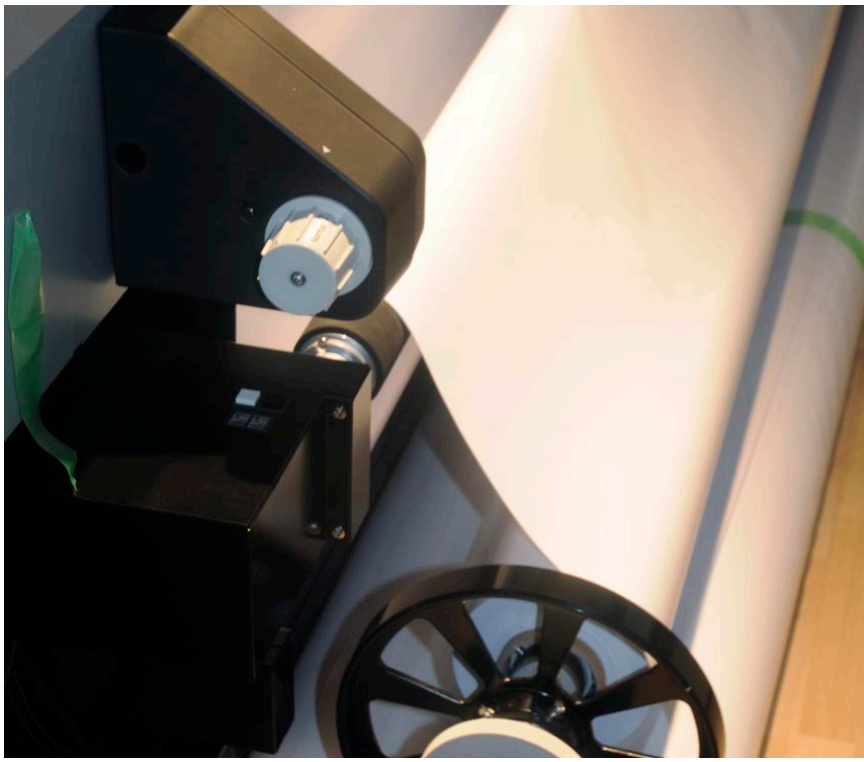
FireWire is the name trademarked by Apple for IEEE 1384 connectivity between computer peripherals. See also parallel, SCSI, and USB.

flatbed as compared to a roll-to-roll printer. A flatbed printer is usually a flat table for printing thick or rigid materials that do not handle well wound up on a roll. So if you want to print on a sheet of aluminum, or a piece of marble or wood, you can't wind that around a roll or reel.

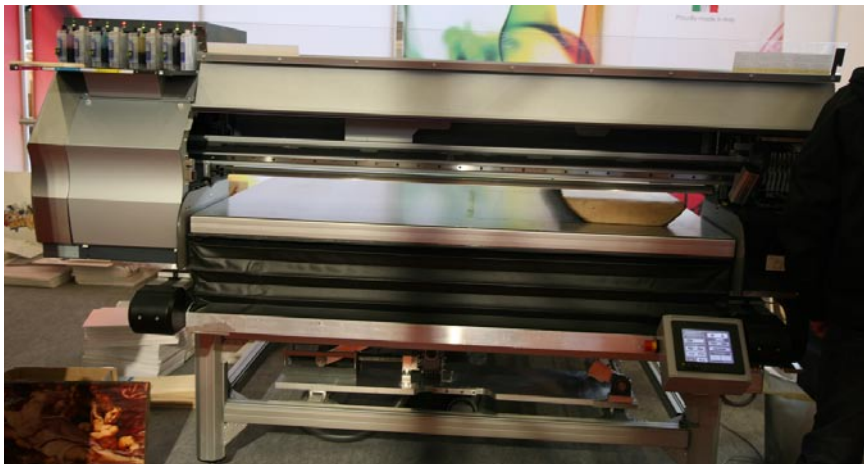
fleet graphics means signage for bus wrap, truck wrap for entire fleets rather than individual cars. Fleet graphics has a wider definition, since truckside advertising does not necessarily wrap around the truck, so is not "truck wrap" but is still vehicle graphics.

flex or flexface means flexible material as opposed to traditional signs that were on or stuck to rigid material such as foamcor. Also spelled "flex face." This material may receive strength from a layer of scrim, a pattern of mesh. Flex face may also be distinguished from material that is stuck onto a backing, since once stuck it is not flexible and gets its strength from sticking to the material. This banner material, PVC, may be referred to as flexible vinyl or flex face. May be reinforced and/or water resistant, depending on source.

flush means to use a cleaning solution to clean out either a printhead or an entire ink line. Normally you would have to flush if you wish to switch to a different kind of ink.



Seiko ColorPainter H-104s feeding system at Viscom Germany 08.



SmartColor flatbed based on a modified Mimaki at Fespa 09.

G

gallon, a unit of measure for liquids. A US gallon (as opposed to an Imperial, British, gallon) consists of 4 quarts. A gallon equals 3.785 liters. For rough comparisons one liter is slightly less than one quart. 1000 milliliters = one liter. So it takes a bit less than five Epson type cartridges of 220 ml to make one liter. So any ink that is sold in cartridges of 220 ml tends to end up as rather expensive when you calculate the price in liters.

glycol ether, a toxic solvent used in some inks. If you wish to lose your appetite, check out this toxic timeline, www.svtc.org/hu_health/get-ime.htm. You can perhaps learn more from the Lyondell website, as they make glycol ether for inkjet inks.

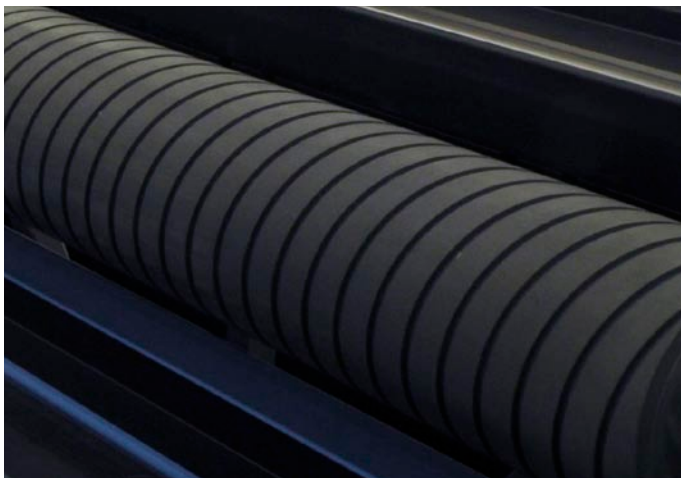
grand format means more or less the same as super-wide format. These adjectives seek to distinguish solvent ink printers that can handle a billboard image with a single sheet. There is no hard and fast rule, but certainly any printer with a printing width 100" inches or more is grand format. These printers can produce many more applications than billboards, such as truckside advertising, but that is really just a moving billboard. Wide format is generally described as 24" through 72". Printers between 72 and 104" have no formal classification; they are sort of in limbo as far as formal designation. Grand format (or super wide) has no consistent formal definition, since there are now many stretch models over 72" in width. Another way to define grand format would be a printer that uses tension bars instead of grit rollers with pressure rollers.

"Green", eco-friendly products. If your clients ask for materials that can be certified as green contact ConVerd, Milene Ribas, milene@converd.com Converd also distributes Yuhan-Kimberly textile printers.

grooved rollers are present on the better class of grand format printers, especially printers that need to handle fabrics. The groves are in a diagonal pattern that seeks to flatten out the material as it is fed and pulled through the printing system.

gutter, see color stripe (also known as a color bar or spit routing).

ConVerd booth, a green company at ISA 09.


Grooved roller.

H

HAPs means Hazardous Air Pollutants. Check out www.americansolventscouncil.org/resources/pdfs/glossaryRegTerms.pdf.

HDPE, high density polyethylene resins. We cover this in a separate glossary of signage materials.

heater and **dryer** are sometimes synonymous and sometimes not. The pre-print heater is not intended to dry anything because there is no ink at this point; the pre-print heater opens the pores of the substrate to accept the solvent ink better. Same with the heater associated with the printing surface under or near the **platen**. Then the next heater is the one to work on drying the ink-media combination. You need to have the substrate dry before it can go onto the take-up spool (or the print will smear or stick).

Hitachi piezo printheads were used in the Matan version of the Teckwin printer from China, and the ColorSpan 72s. The ColorSpan 72s is designed, engineered, and manufactured in the USA and has no relation to Teckwin or Matan. Hitachi printheads are presumably at least designed in Japan, though a main Ricoh printhead office is in the US. FLAAR covers printheads mainly in our report on printheads for UV printers. Today Ricoh continues what used to be Hitachi printheads; various models are used by ColorSpan (now HP), Matan, and Gandinnovations.

hot swap means to add ink without ruining the print. The printer will usually stop printing, but if you can get the ink in fast enough, the printer can continue without leaving a noticeable defect. Some other printers can be loaded on the fly while printing; they don't even stop printing. Of course this assumes the printer is merely low on ink and has not run out of ink totally.

hybrid flatbed means a printer with grit rollers and pinch rollers merely with a simple table added to the front and another table at the back to enable handling some thick rigid media. If a printer has a moving transport belt, this is a combo flatbed. Although there are several combo-style Chinese solvent flatbeds, there are not any European or Japense combo-style solvent printers (all combo printers tend to be with UV-cured inks, not solvent). The Mutoh ValueJet with MuBIO ink is a hybrid style.

hype, "400 x 400 dpi – yes that's 4 times more resolution!" If their previous model offered 4 times less resolution, it must have been pretty awful. This ad then goes on to claim "400 x 400 dpi, giving an appearance of well over 600 DPI." The same brochure offered "rocket speed" and "ultra high speed printing."

Mutoh ValueJet with MuBIO ink is a hybrid syle.

IEEE stands for the Institute of Electrical and Electronics Engineers, Inc. Their web site is www.IEEE.org. Among its many activities, the IEEE sets standards for some of the connectivity cables between computers and peripherals such as inkjet printers.

IEEE 1284 is the standard for parallel port connectivity between a printer and a computer. For more details see www.fapo.com/ieee1284.htm.

IEEE 1384 is the generic name for what Apple has trademarked as FireWire for Mac computers. So when used on a PC, you have to call it IEEE 1384. Irrespective of the trademark, almost everyone calls this manner of connection FireWire irrespective whether on a PC or a Mac. The word has quickly become as generic as Kleenex.

ink delivery system; in the case of solvent ink printers the solvent cleansing is part of the ink delivery system.

ink flush, to my mind an ink flush is when you want to clean out one kind of ink before you insert another kind of ink. This may involve using a flushing or cleansing solution.

inkjet receptor coating is like a primer on top of the inkjet paper or substrate. The inkjet receptor coating is filled with chemicals which interact with targeted chemicals in the ink. The best media and inks are those which are developed in tandem with each other. This is why you can't just buy Brand X material and assume it will work with your particular printer. The chemicals in your ink may have been developed to work best on some other kind of material (usually more expensive).

Intelligent Interweaving was developed by Mutoh Japan. Mutoh Europe then developed their own version based on the Japanese original. When I first heard about Intelligent Interweaving, I thought it was a marketing ploy: just jargon (like Macintosh used in the days that Dell and other PC had faster Intel chips). Encad always used mumbo-jumbo words to try to make its inefficient Lexmark printheads and issue-prone Encad ink delivery system sound almost professional. But when I spent a week at the Mutoh R&D, Mutoh factory, and tested Intelligent Interweaving day after day, I found that it actually worked. So a FLAAR Report came out on Intelligent Interweaving and was downloaded by about 40,000 people a year, so many downloads that even competing solvent printer companies noticed how market perception changed during this year as a result of the FLAAR Reports. Two years later Roland came out with Intelligent Pass Control. Today some companies license the Mutoh system but most companies have developed their own comparable equivalent.

Ink that is purged goes to the waste ink container. Seiko Color Painter H-104s, 2009.

Intelligent Pass Control is Roland's answer to the Intelligent Interweaving system of Mutoh.

interface means what kind of system is used to connect the printer with the network or with the print server (computer). May be an old parallel connection, or a newer USB or FireWire, or an Ethernet connection.

J

jet recovery is not always mentioned in spec sheets. Anything having to do with jets, blocked jets, or buddy jets, depends on the printhead brand and model, and how the printer software handles controlling the individual jets. This software is called the firmware.

K

knive guide or knive slot, is a long recessed slot across the front of the platen so that the operator can manually run a knife blade (X-acto knife or comparable) and cut the material manually. The downside of this position on some printers is that shavings and detritus from the cutting may end up on the platen and eventually on the printhead nozzle plate (causing blockage). Or the detritus may clog the holes in the platen where the suction of the vacuum is supposed to take place.

Konica printheads Konica were reportedly the printheads used by the XES oil-based printer. Konica used presumably their own heads in the ill-fated Iguazu proofing printer, shown prominently at DRUPA 2000 and Photokina 2000. Then, by 2005-2006, Konica printheads were so improved that they became well received. It would be interesting for the history books, so to speak, to learn who and what caused this dramatic improvement. The first Seiko ColorPainter 64s by 2006 used a KonicaMinolta printhead. Today I rate KonicaMinolta printheads as among the top four brands.

KT board, a kind of inkjet printable sign board material.

L

launch, as in launch date. First there is the "announcement" date, then the launch date. Rarely is a printer really finished by launch date. Finally comes the shipping date. And a few months after all this you might actually have a chance to receive your new printer. Many printer brands and models are still in beta stage at their first shipping date. The Mimaki JV5 was still being fixed, retrofitted, and improved well over a year after its first showing at an international trade show.

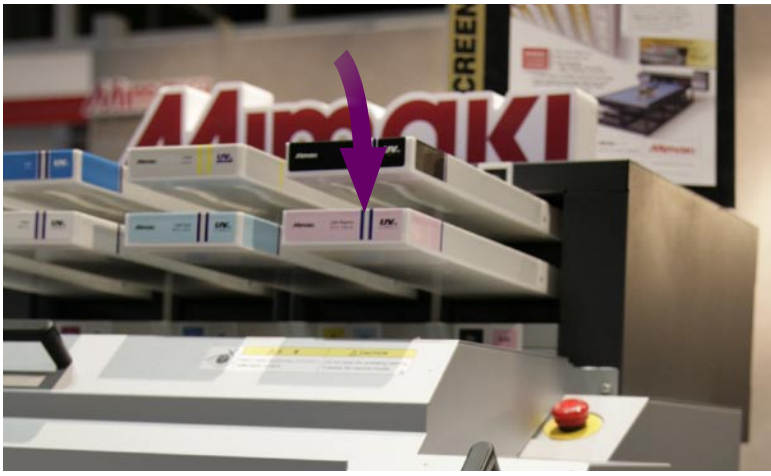
Lc is one way to abbreviate light cyan. Regular cyan is abbreviated as capital C. There are two ways to write out a 6-ink system: CMYKlclm or CMYKcm. K is black. Light cyan can also be spelled lc. I prefer the designation CMYKcm.

life, printhead life, is measured in billions of drops per nozzle. For an Epson printhead, if you change ink types, that will dramatically lower the life expectancy of your printhead, because to change ink types you need to purge out all the old ink. Even if you stay with one kind of ink, and even if you use only the official Epson ink, if you have to purge a lot, that will significantly cut down the life expectancy of your printhead. Otherwise, if you use your printer every day, have no particular purging issues, your "permanent" Epson printhead may last one or two years: and will then need to be replaced. Spectra and KonicaMinolta are more industrial class of printheads. If properly maintained, they can last for several years. Head strikes against the edge of material or a raised area in the material can shorten the life of any brand of printhead. Most printheads have a recessed nozzle plate. The Mimaki JV5 has a clever bumper that can protect against some kinds of head strike (notice that no printer is all bad; the Mimaki JV5 does not some good features).

lite-solvent. There is no official definition of lite-solvent or a distinction between lite-solvent and mild-solvent. There is no official body that has defined eco-solvent ink either.

Lm also spelled lm, light magenta

Mimaki Lc cartridge at ISA 08.



Mimaki Lm cartridge at ISA 08.

LOD inks, Lyson OutDoor or Lactate OutDoor ink. This is a kind of solvent inks developed by Lyson in England. When the ink is CMYK + Red + Blue, the full name is Lyson LOD Pentachrome solvent-based ink. Pentachrome is this batch of six inks; LOD is the kind of solvents preferred by Lyson. Lyson ink is well known but, most politely put, was always a bit different than other inks. Lyson tried to make their own printers to push sales of their own ink. Their Tiara brand printers were a marketing, sales, and ink fiasco and Tiara went bankrupt. This injured Lyson also, and their remains were bought by Nazdar. Their inks are still available today.

long-life piezo heads. In the years 1999-2003, most printer manufacturers who used Epson printheads claimed their heads were "permanent" and that thermal printheads were not. But out in the real world, long-life is a bit exaggerated and several brands of piezo printheads are not at all permanent. So calling any piezo printhead long-life is begging for a disclaimer. Moreover, Epson printheads were not long-life with solvent inks during the first generations of solvent ink experimentation. Now that Mimaki, Mutoh, Roland and even Epson itself are pumping eco-solvent ink through these heads, the current generation Epson heads have a longer life than in earlier years. Xaar heads such as their model 1001 are industrial strength and provide impressive performance. It is the cheaper Xaar 128 heads used in Chinese printers that caused their reputation to be relegated to low-end products. But this reputation has improved during the last three years. Nonetheless, most printheads are consumables; piezo last longer than thermal heads, but are not eternal.

low hazard; the developers of ink and printers hope you interpret this jargon as meaning no hazard. Low hazard supposedly means "environmental friendly solvents". Sorry, but this is a contradiction of terms.

low odor: means less obnoxious odor than regular solvent, but no low odor eco-solvent ink is without smell. The test is very easy: tell your spouse you are going to park an eco-solvent printer in your living room or bed room, and will print several hours a day for 5 days every week. See how quickly the spouse takes the children, leaves the house, and files for divorce. I defy any ink company or inkjet printer reseller whose spouse would allow one of their printers to print even 5 hours a day inside their home, in the same room as their children played or slept.

M

maintenance station can also be called cleaning station, service station, or other jargon. This is where the printheads spit, or are purged or sucked clean, to clean out the nozzles. There may or may not also be a wiper (wiper blade) like a windshield wiper to clean the nozzle plate. The capping station may be the same location as the maintenance station, or may be at the completely other end of the printer. The parking location may be one, or the other, though for overnight parking, this would tend to be at the capping station.

mapping out jets is accomplished routinely by printers using HP thermal printheads. With piezo printheads you rarely see this mentioned in specs. ColorSpan, however, offers jet replacement on the fly. If one jet is clogged the printer senses that and compensates with another jet on the next pass. This is their "buddy jet" concept. Increasingly this concept of replacing a faulty jet on the fly is being added to high-end printers of all kinds. So now even systems with piezo printheads can offer this feature.

material safety data sheet (MSDS). It is probably required by law to post this for hazardous materials that are used in

Mutoh RH3 maintenance station

the workplace as well as to educate workers about the contents of the MSDS for materials that they come into contact with.

media: when inkjet paper has an inkjet receptor coating on it, then the combination of the paper and the coating is called media. In layman's terms, media is pre-coated material of any composition that is used in inkjet printing.

MEK, methyl ethyl ketone, a highly volatile substance and probably something you, your spouse, and your children would prefer is not in the inkjet ink you are exposed to every day.

mesh kit is an optional accessory for some printers that collects the ink that passes through mesh signage material or any open weave fabrics. You do not want this ink to fall directly on the platen, and especially not to fall into the vacuum holes. So you use a mesh kit. This is generally a trough. The ink either drains out one end, or you lay down a paper or cloth to soak up the ink and throw the paper or cloth away when it is saturated.

Metamark a brand name of a kind of vinyl that produces outstanding quality with less splotchiness than regular vinyl. Metamark is evidently a British company but seemingly their material is available in the USA too.

Micro-Quad technology, is the house-brand for ColorSpan 72s and then the ColorSpan UV printers that used Ricoh printheads. A 25 picoliter drop size was okay in the era of the Gator solvent printer (ColorSpan 72s) but is not impressive today (in 2009).

mild-solvent sort of means less solvent (less cyclohexanone) than full strength solvent ink. I consider lite- or light-solvent essentially the same concept as mild-solvent. I prefer to use the term mild-solvent for all of this class. See also eco-solvent.

Mimaki is a respected Japanese engineering company that makes printers for dye-sublimation textiles, various solvent inks, and UV-cured inks. Some of their printers have been very successful (JV3 solvent printer). Others have been plagued by small but pesky issues (JV5 solvent printer and JF-1631 UV-cured printer). Today (2009) their new print-and-cut printer is nice (Mimaki CJV30 series, CJV-60, CJV-100, CJV-130, CJV-160). We do not yet have any evaluation project on these printers so are not able to issue any recommendations, on the JV33 for example (JV33-130, JV33-160, JV33-260).

Mimaki booth at ISA 08.

Mimaki JV2-160II MS, JV2-180II MS, MS=mild solvent. This was the printer introduced probably late 2002 or early 2003, but evidently quickly withdrawn. I have a simple one-page flyer on it, $19,995 for the basic version (including RIP and PC RIP Server); $22,995 for the wider model 180. I was told that this class of printer was withdrawn very quickly after the then head of Mimaki USA indicated he felt it would be misleading to advertise such a printer. His prediction was totally correct: both Roland and Mutoh evidently had serious issues with their approximately comparable first generation solvent printers (each for different albeit logically both media-ink inconsistency reasons).


MimakiJV2-160II MS at ISA 02.

modification. If the ad during 2002-2004 claimed "no modification necessary for using an Epson, Roland, Mimaki, or Mutoh printer with our solvent inks," be wary. A savvy buyer knows that you need modification. Many printers in these early years lacked **pre-heaters**, usually lack a heated **paten** too. These printers probably lack a flush system or a mechanism to keep the printheads fully functional. That was because early eco-solvent printers

"modified for solvent inks:" was sometimes wishful thinking in 2001-2003. Too many of the printers in the years 2001-2003 were not much more than jerry-rigged to try to take solvent ink or one kind or another. But when I want a 4-wheel drive vehicle, I prefer to have it factory installed, rather than modified in a local garage. 4WD usually works best with an off-road suspension system, for example. It helps to have wider tires to keep your car's tender underside from being dragged over rocks. It is the same with using solvent ink. So if you are offered an upgrade kit, a conversion kit, be realistic. It is much better to obtain a current model Mimaki, Mutoh, Roland or Seiko solvent printer (eco-, lite-, mild- or whatever) than to jerry-rig an older used printer with a conversion kit.

Mutoh Japan, Mutoh Europe, and Mutoh America are the three largest segments of this Japanese company. Mutoh Europe has its own separate factory and R&D staff. I have spent an educational week in Mutoh Europe in Belgium, so know the products that are manufactured there, primarily the Spitfire and Rockhopper. The ValueJet came afterwards and there are no FLAAR evaluations on that series. An evaluation requires a specific project with reasonable funding to cover the time and staff: Technical Writer, graphic designer, web designer, web master, computer programmer to get the report easily downloadable, plus the time to test a printer and then find a printshop to undertake a site-visit case study, etc. We no longer do reviews based only on inspecting printers at a trade show.

Mutoh booth at ISA 09.

N

non-aggressive solvents, a contradiction of terms in my mind. You need an aggressive solvent to bond with raw vinyl. So a non-aggressive solvent means a non-aggressive ink translates into less adhesion and poor abrasion resistance.

nonporous surfaces a glaze makes a ceramic surface nonporous. Any surface that is vitrified is nonporous. Surfaces such as glass, ceramic, or metal have a nonporous surface. Here solvent inks, and even water-based inks such as Staedtler Lumocolor have a problem to bond with the surface of the material.

nozzle plate is the strip of material with all the holes where each nozzle jets out ink. The nozzle plate can be damaged by being scraped across the surface of a rough material. A head strike against the raised edge of a material will also damage the nozzle plate. Most, but not all, nozzle plates are recessed to protect them.

O

organic solvent inks, SolventJet's name for their current generation inks which are Lyson Pentachrome inks.

overcoating means either top coating (with a liquid or spray) or regular lamination with a thin film. "coating" is simply a layer of transparent material to provide a surface effect: satin, glossy for example. A coating gives slight protection against scratching but is not as strong as lamination.

P

parallel (IEEE 1284), SCSI, USB, or FireWire (IEEE 1384)

parking location is where the printhead carriage rests when not printing. The parking location may be the same area as the maintenance station or the capping station, or can be elsewhere (but it is almost always at the far right end or the far left end).

platen is the flat area across the center of the printer, the entire width. The platen ends where the parking station, maintenance station, or capping station begin. The platen usually has a vacuum system (holes in the metal of the platen). The grit rollers are set into

platen heater is the heater for the moment of the printing, when the ink is hitting the substrate. Most modern solvent printers have a pre-heater, a platen heater, and a post heater or dryer.

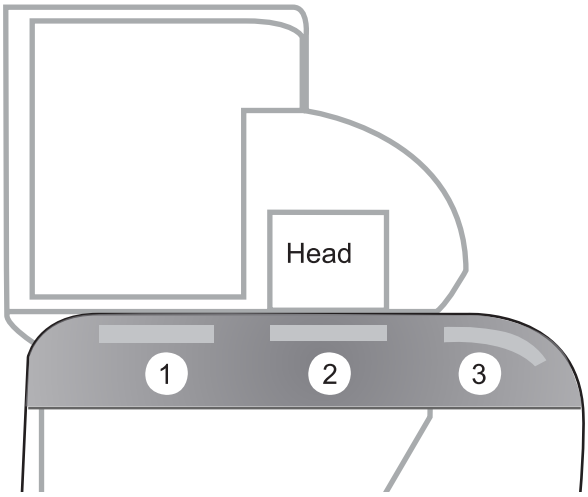
peel roller is a term I rarely hear, but is used, and pictured, in the Seiko H-104s manual, 2008, p. 2-34.

Pentachrome ink, trade mark of Lyson, CMYK Red and Blue. See also LOD ink.

photo-realistic means photo quality. Too often, in the past, splotchy, mottled, or otherwise low resolution print quality was touted in PR releases as photo-realistic. Today, in 2009, all Epson, Roland, Mutoh, Mimaki, and Seiko printers can produce photo-realistic quality at their slowest print modes.

piezo, piezo-electric printhead, a kind of printhead technology used by Brother, Epson, Hitachi, Seiko, Spectra, and Xaar. In essence a piezo printhead uses an electrical impulse to flex the piezo-ceramic actuator which, on command by the electrical impulse, changes shape and thereby pushes the ink out of a reservoir through a nozzle to form each inkjet drop. The actuator is PZT (Plumbum Zirconate Titanate, better known as Lead Xirconate Titanate). A piezoectric material is one that can expand when electricity is applied. The competing and very different kind of thermal printheads are used by Canon, HP, and Lexmark (for Encad). Thermal printheads can't handle solvent ink, so all printheads used with solvent ink are piezo technology.

Here you can see the parking location of the Vutek 3360 at Dubai 09.



#1. Rear heater that preheats media.
#2. Print heater that penetrates ink into media to fuse the ink.
#3. Front heater that Dries ink to stabilize print quality

Drawing taked from a Seiko ColorPainter H-104s.

plotter, what is the difference between a plotter and printer? A decade ago architects and engineers used "pen plotters" to print their CAD drawings. A mechanical pen, with black ink, did the drawing. Hewlett-Packard was the leader in pen plotters for CAD drawings in those years. When Encad and other companies showed how inkjet printheads could be controlled by similar

mechanisms as worked for years on pen plotters, wide format inkjet printing was born. Today old-hands at HP still refer to their machines as plotters and to the printheads as pens. But this is not the terminology you should learn. The correct word is printhead, and the proper term is printer, not plotter. Today the term plotter sometimes refers to a vinyl cutter. In the wide format printing industry, most old-timers at reprographic shops still refer to any machine that prints CAD images as a plotter, even if the machine is a normal inkjet printer to the rest of us. Using the word plotter for a wide format inkjet printer is not bad, it is just a tad dated, and not really correct in the sense of the mechanical technology employed.

post-heater is the heater after the substrate has been printed. So it is a post-printing heater, to help the solvents to evaporate off and leave just the pigmented colorants. Some printers have a post-heater, such as Mutoh and hence Agfa Grand Sherpa Universal; many other printers have just a set of fans.

pre-coat means to put an **inkjet receptor coating** on a material, such as to help mild-solvent ink interact with some materials..

preheat, Skyton claims to preheat the ink. Most systems preheat the vinyl and then heat again to dry it. I will have to do more research to compare and contrast the value of heating the ink as well as the vinyl itself.

Pre-heater is to open the pores of the media to better receive the ink. Ideally there should be three heaters: pre-heater, **platen heater**, and **post-heater.**

pre-print, "Heated media pre-print and print areas" (ColorSpan 72s) is translated in their own brochure, "maintains uniform surface temperature across printing area to control dot gain on various media."

printable area is normally less than the full width of the media. Epson is one of the few printers that offers flawless edge to edge "borderless" printing. Thus the Mutoh Rockhopper 38 (the European version of the Mutoh Junior in the US), accepts media that is only 37.55" wide and prints only 36.77 inches wide. So by the time you trim it down you really have less than 37 inches. So calling it a 38-inch printer is a slight exaggeration.

productivity, jargon for printing enough, fast enough, to be productive. If you are not productive compared to your competition you may not be able to compete.

production mode, variously defined. May be fastest mode, in which case output is probably junk which picky clients would not accept. But on some printers production mode is the bare minimum that is acceptable by clients who want low price over high quality. For Oce, draft or billboard is the fastest mode; production is middle; high quality is their best mode. It is usually the number of passes which makes the difference. Draft may be 2-pass, mid-range may be 4-pass, better quality may be 6-pass.

pseudo-solvent ink is my designation for anything but true full-strength solvent ink. Eco-solvent, mild-solvent, and lite-solvent are all pseudo-solvent in their own way.

purge, to forcefully pump lots of ink through a system to try to get rid of air or other impurities or clogging of an ink line or printhead. If you are purging the printhed you may then need to wipe it clean. This tends to be done automatically. Purging takes time and wastes a lot of very expensive ink. In worst case scenarios you may have to purge six or more times in immediate succession.

Teckwin TeckStone purging inks at dgtech site visit, 2008.

Q

Quality mode, see also Draft mode and Production mode.

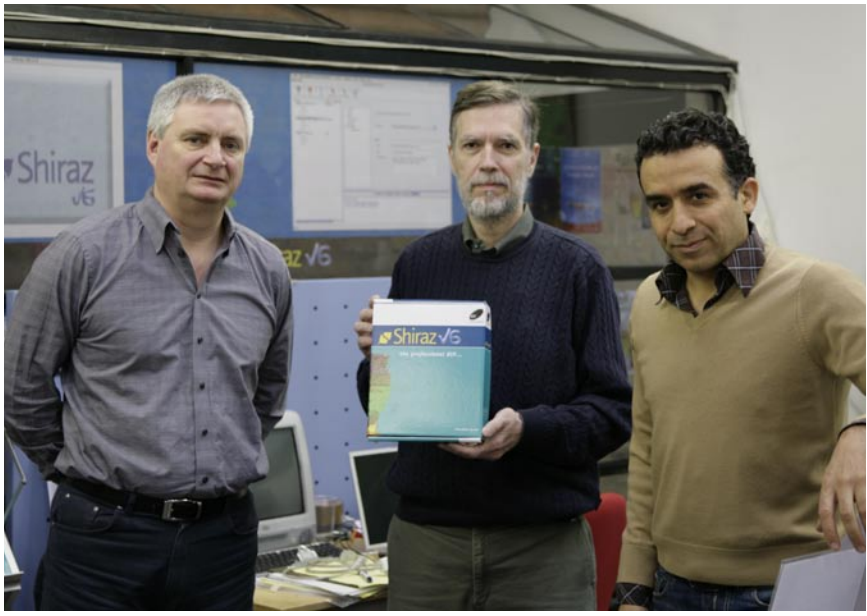
R

rewind unit is rarely found. A rewind unit allows you to wind from one core to another, or when printing on both sides.

RIP, Raster Image Processor, a kind of software that is used to run inkjet printers and other devices. We have a complete glossary on RIPs, so please see that chapter.

rocket speed, a claim by an American rebranding of a Korean solvent ink printer. A rocket would never leave Earth's atmosphere if it moved this slowly. The same brochure claims "ultra high speed" printing in 8, 4, 2, and 1 pass mode. The quality at 1 pass mode would most likely be junk. "Blazing speed," claimed by Roland, is also misleading because Roland is among the slowest of the printers (because it uses Epson piezo printheads). The reason the claims are actionable as seriously misleading is because you do not get the high quality (that the same ads claim) when you print at the machine's fastest speed. Beside, even the fastest speed of a Roland is hardly blazing. Rocket speed is even more misleading. Most printers with Epson heads, at high quality mode, can best be said to be "less slow than their own previous generation printer." None of these printers are really fast until you use dual CMYK in which instance you don't get the benefits claimed for 6-color high quality mode. So the ads verge on bait and switch. You are baited by high quality, but switched when you find out you get the worst quality the faster you attempt to print. These problems are not limited to Roland; Canon, Encad, and HP are not able to produce their best quality at their fastest speed either. But no solvent ink can pass through the Canon, Encad, or HP thermal priintheads.

Roland DGA is a large and successful manufacturer of many diverse products. Wide-format inkjet printers are only one segment. Roland originally made water-based printers that were the world standard for giclee and fine art photography. There were no Epson printers in that era that even had pigmented ink. Then, over the years, Epson came out with models that each generation were a bit better, less metamerism and less slow than



Here is Nicholas at Shiraz V6 RIP factory visit, 2006.

Roland booth at FESPA 09.

the previous two years. Finally Epson decided they wanted to take over the markets for proofing, giclee, décor, and fine art photography. So Epson said their printheads would not be available for any competing company that attempted to focus on those markets. So Mimaki, Mutoh, and Roland had to stop featuring proofing, giclee, décor and fine art photography applications. Mimaki went into textiles, dye-sublimation, and solvent. Mutoh and Roland went into eco-solvent. Today, in 2009, most Roland printers still use Epson printheads, since these are the lowest cost. Industrial printheads (Spectra, etc) tend to be too expensive since they are made for serious production all day all year. One series of Roland printers, the AdvancedJet AJ-740i and AJ-1000i, use Seiko printheads. The entry-level and mid-range Roland printers, still use Epson heads: SolJet Pro III XJ-540, XJ-640, XJ-740, Hi-Fi Jet Pro II FJ-540, etc.

roll lifter is a wheeled cart or dolly-like conveyance to allow you to lift the heavy rolls of substrate from the floor up to the printer.

roll to roll vs sheet-fed flatbed. Roll to roll (or reel to reel) means paper, substrate, material, or media which is wound around a cardboard core and delivered as a roll of material. Your printer has to have a mechanism to hold these rolls. In distinction a flatbed printer is a flat table to print on rigid and often thick materials that cannot be wound around a reel. Many printers are hybrids or otherwise take both rolls of media and flat rigid thick materials as well.

roll to sheet is an unusual method used by some Scitex Vision printers such as the TurboJet (now HP Scitex branded). A flatbed printer would tend to print sheet to sheet.

Seiko Color Painter H-104s, mild-solvent roll to roll printer at ISA 09.

S

saddle, an alternative to holding a roll of media or substrate rather than using a spindle. A saddle is formed of two roller bars near each other. You don't need to run a spindle through the roll. You don't need to fumble loading the end of the spindle into two holders (one at each end). Loading a saddle is quicker as a result. A saddle is in some aspects cheaper to manufacture than a really good spindle with its collet.

UV printers use saddle also, here you can see efi VUTEk GS5000r UV saddle at ISA 09.

SCSI, pronounced Scuzzy, is a form of connecting computer peripherals that was popular in the 1990's. SCSI is very fast but the cables have to be very short. Also, you absolutely have to turn all periphals off before you can connect a SCSI cable. If you connect a computer with a peripheral while both are turned on, you can damage both, seriously. There are many sizes and shapes of SCSI connectors.

See also parallel (IEEE 1284), USB, or FireWire (IEEE 1384)

scratch resistance is a problem with most inkjet prints but especially for eco-solvent, early formulas of bio-solvent ink, and UV-curable inks on some surfaces.

scroller is the name for a feature on the feeding and also take up spindles that make them easier to scroll the material taut. This feature is clearly indicated in the drawings of the Seiko ColorPainter H-104s.

Seiko I Infotech designs and engineers their own printers in Japan. Their mild-solvent printers are named ColorPainter. Their model 64s and 100s set sales records because of their brilliant saturated colors circa 2006. Now you can get a value-priced version with six colors in the ColorPainter V-64s. Their other new models H-104s and H-74s have even better color gamut (eight colors instead of the earlier six colors) or the option of dual speed (dual CMYK).

Seiko Color Painter H-104s printhead at site visit 2009.

Seiko printheads are used in VUTEk GS and QS printers with UV-curing, and in some Chinese-made printers. Seiko printheads, like those of Toshiba Tec and others, are licensees of Xaar. But Xaar does not make or design their heads, Seiko makes their own heads; Toshiba Tec makes their own heads, etc.

service station, is the area where the printhead will be cleaned and serviced either on the fly while in use, or where the printheads will be parked when the printer is not in use.

shipping date, is the date on which your promised printer actually is supposed to arrive. In 2001, if you ordered a Kodak 5260 printer, the shipping date kept slipping. Finally Kodak withdrew the printer without even saying why. The Oce Arizona 60UV also never met it's shipping date. It was withdrawn. The Luscher JetPrint was shipped, but the printer was not adequate and after five people in the US got stuck with this half-million dol-

lar experimental prototype, Luscher cancelled further shipments (without ever admitting why). Fortunately, most solvent printers that are launched do eventually get shipped, though the Mimaki JV5 shipping date probably slipped quite often during the first year(s). But other Mimaki solvent printers do not have serious issues and are popular.

TecStone arriving to dgtech Guatemala on shipping date 2008.

signage, generalized word to lump together all kinds of signs. A representative list of diverse kinds of signage is presented in the Appendix to this PDF.

SolaChrome is the house brand of the solvent ink from ColorSpan for their 72s printer.

solvent (noun) is defined from web sites as: The chemical component of an ink which dissolves the other components to create the final product that is jettable through a piezo printhead. Actually water is also a solvent. But solvent ink implies the colorant is carried by a vehicle, in this case "solvents." In water-based ink the vehicle is water (and lots of other chemicals). I show here the solvents that one web site happened to list; this was the first site I landed on and the list looks useful. You can acquire a full list from any MSDS. www.inkjet.com.au/Technical%20Bulletins/Techbulletin0006.ht

Solvent
Methanol (Methyl Alcohol)
MEK (Methyl Ethyl Ketone)
Ethyl Acetate (Acetic Acid Ethyl Ether)
Acetone (Methyl Ketone)
Ethanol (Ethyl Alcohol)

solvent flush is the solvent cleaning fluid that large production solvent ink printers have to use to flush out stuff that might block the ink lines or printhead nozzles. see ink flush

Smart Pass Technology is from Seiko I Infotech, so is distinct from other software/firmware control methods to minimize the visible aspects of some kinds of banding. As soon as we schedule our visit to the main demo room we will study this Smart Pass Technology in more detail.

Spectra, a brand of piezo-electric printheads. Expensive but considered as long-lasting and of a high quality . Several printer manufacturers have started out with Xaar printheads (the original Durst Rho, pre-production model of Mutoh solvent ink printers), but then switched to Spectra.

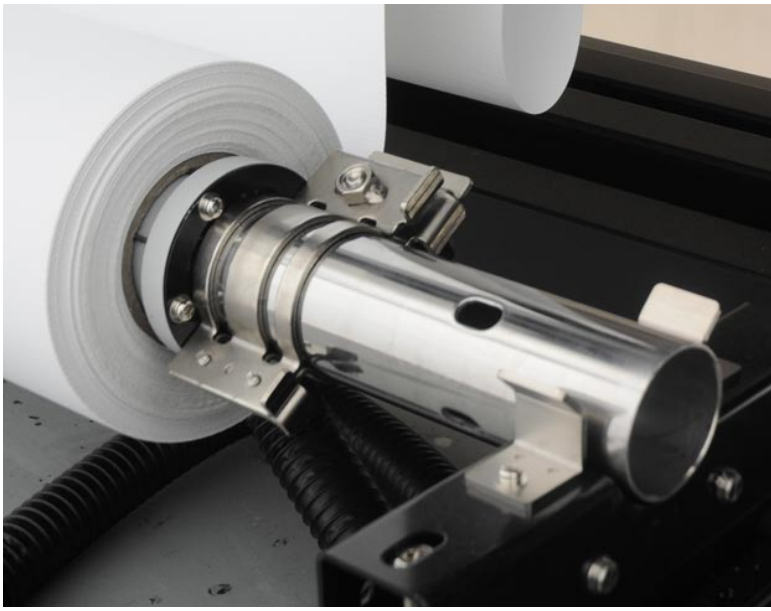
speed vs quality trade off. Every printer manufacturer and reseller list their top speed and their top quality. Most manufacturers and resellers blissfully fail to warn buyers that you can never achieve the hyped speed with the claimed quality. The truth is that the faster you print, the worse the quality becomes. The reason is because to achieve quality the printheads must go back and forth, back and forth, over the same area, micro-weaving dots to make up for defects in the first pass. A Roland must make 32 passes to achieve its top quality.

Well 32 passes in a Roland can mean a single print takes up to an hour. If you are supposed to be printing 73 copies of a job, obviously you will be heading for bankruptcy if it takes 73 hours to finish this one job. Besides, half way through the printer may start to band, or a color may drop out. Fortunately, first Mutoh, and then Roland, and now most other manufacturers offer a software that prints in a pattern so that the banding is not as ugly or as easily visible at all. So you can print fast in some

circumstances. But for the ultimate quality even with intelligent software tricks, it still helps to use 8 to 16 passes.

So there is a trade off relative to speed compared with quality: the best quality is at the slowest speed. Besides, the output at the fastest speeds looks like junk. This output is usually so poor that it wastes your ink and media. I can't imagine that sign shops use this speed even for proofing, because the appearance is so awful you can't use it to judge how the final print will appear anyway.

So if you want the truth, take the slowest speed. That is what you are stuck with. And a final comment, you can forget about 2880 dpi and 5760 dpi. Those dpi claims are pure nonsense. Most media can't hold that much ink without cockling. Most Epson printers can't print these dpi ratings anyway (again, the media will not hold that much ink). The sole purpose of these phoney numbers is to bamboozle you into thinking the printer is better than a manufacturer who either is more honest or whose printheads don't attempt to produce what you can't use anyway.



Here you can Seiko ColorPainter H-104s spindle at 2009.

spindle is a rod that holds roll-fed material by being fed through the hollow core of the roll of material. A machine engineer might consider a **mandrel** as an alternative word for some kinds of spindles in some situations. Which term you use depends to some degree on what your background is. See also **collett** and **saddle**.

Roland SolJet PROII, spitting ink area, at Perfect Art Guatemala site visit.

spit gutter, sort of a spittoon at one edge of the printable area, where the printhead automatically jets at least one drop of each color. The purpose is to keep the ink flowing in all printheads even if the design does not call for that particular color. If you had a large white field, and widely scattered letters of pure magenta, your black, cyan, and yellow inks would not be printing. As a result the K, C, and Y ink would tend to clog the nozzles as the solvent evaporated or otherwise dried out.

spitting ink is what the printhead does when it attempts to purge out air or other impurities which may be blocking the printhead. Spitting is done while at the service station.

stretch model, is a polite way of saying that a 100" or 104" printer is not much more than a 74" printer that has been stretched to a lengh of 100-inches. "Stretch" implies that the 100 or 104" version is not built from the ground up to handle heavy rolls or serious production 24/7. A reverse example would be the Seiko ColorPainter H-104s. This is built from the ground up for speed and for the roll size and weight for a printer this wide. The H-74s is also the same strong frame, but less wide. This is the best way to build a true production machine. Too many other wide models look like stretch models: yes, of course they include a few extra features to handle the extra width, but they still have the look and feel of a strech version.

substrate is the material on which you print. If a material consists of several layers, the substrate is usually the main layer. If the material has an inkjet receptor coating, that coating is the top layer. On some materials the bottom layer has a surface to facilitate it being moved forward by the rolling movement of the grit rollers.

sub-tank is a feature on some solvent ink printers such as the Infiniti FY 6250SL where the ink is pumped from main ink tank to an ink sub-tank.

suck. There are several ways to keep a solvent ink system clean: one is to force ink out the nozzles by purging. Of course this is expensive because you waste ink. The other manner is a vacuum suck, where the ink system is not pushing, but the printer service station has a vacuum cap that is sucking. I call the two systems "Vacuum / Suck" vs "Spit / purge & wipe." There may be variants, where it vacuum sucks and then wipes. We constantly add fresh facts as we return from field trips to gather documentation.

suction, head suction cleaning, sucking on the heads as opposed to pushing ink out. The purpose of both suction and purging is to get the debris, clogs, and other defects out of the nozzles so that the ink can jet properly.

supply side is the side of the printer where you load your printable material, see also **takeup side**

T

take-up side is where the printed material comes out.

Tiara Opal 43 and **Tiara Opal 63**, are retrofitted Mutoh Falcon Outdoor printers. This Mutoh is called a Rockhopper in Europe. This original Opal has been replaced by the Opal II.

Mutoh Falcon II outdor printer at Sigraph 2003 trade show.

Tiara Opal II, a retrofitted Mutoh Falcon II Outdoor. The waste tubing, pumps, and everything in the ink delivery system has been removed and replaced to withstand the ink solvents. Uses the original Epson printheads of the Mutoh. After a few years Tiara went bankrupt because converting a water-based printer was not a professional way to create a true solvent printer.

Tiara Ruby, a 43" printer, the 43" version of the 62" which is the Tiara Opal. This would conflict with the Tiara Opal 43, so we will have to ask Lyson to explain their nomenclature.

Tiara Sapphire is a printer model based on a Seiko printer that originally used oil-based inks. Tiara fixes the printer so that it takes Lyson Pentachrome 6-color inkset.

top coating means different things to different industries. Normally it implies lamination, whether by liquid spray or varnish or glazing. The other meaning is an inkjet receptor coating, since this is usually the top coating layer in inkjet media. May also be spelled topcoating, especially when it means an inkjet receptor layer. However in most contexts, top coating means a lamination-like material. Just realize that a coating is to provide gloss or satin finish; a laminate is to do that plus provide protection against sunlight.

true solvent, now that pseudo-solvent ink has been foisted on the public, the printer manufacturers that still use traditional solvent ink have to be sure they designate theirs as true solvent.

Lyson Tiara Opal II was current Tiara solvent ink printer at Sigraph 2003 trade show.

U

ultrawide, is not generally a standard term, but would mean super wide.

uncoated material would be raw vinyl or any material that has no ink receptor coating. A primer or any other pre-treatment implies a manufacturing cost, hence uncoated material is inherently less expensive than coated material. see also coated material, which should be called media.

upgrading, similar to conversion: converting your old Roland water-based printer to an eco-solvent printer. One upgrade converting manual had most of the words either not correctly spelled or in literal translation. Most American and UK firms which upgraded Roland printers in 2001-2003 had endless problems, because you can't simply change a few external parts. The entire chassis and structure, the entire ink tube delivery system, all the tubes, and every part of the printer including the old version Epson printheads were never made for any kind of solvent ink. I am always open to learning, and if I ever visit a printshop in the US or Western Europe that upgraded a water-based printer successfully to a solvent printer (of any flavor, eco-, lite-, or mild-), I will be glad to amend my observations. But I can remember the literal pain and suffering of too many the buyers of the major brands of the first generation of eco-solvent printers, when even the major manufacturers were just retro-fitting in their haste to crank out an eco-solvent printer. Thus I am skeptical that any after-market company can succeed with a mere kit where Roland and its partners were not successful their first year(s) even with an entire factory available to them. Tiara was a good example of a company that tried converting; they went bankrupt. Today neither Mimaki, Mutoh, Roland, nor Seiko use converting; all the current year 2009 models are based on many years of experience handling eco-solvent and/or mild-solvent inks.

USB, see also parallel (IEEE 1284), SCSI, or FireWire (IEEE 1384)

UV-curable ink is used primarily in industrial sized flatbed printers. UV-curable ink is more costly, as are the printers themselves. Advantage are fewer VOCs, less odor, and you can print on more materials without pre-treatment. But there are issues of adhesion and abrasion resistance on some materials. FLAAR has an entire Series on UV-curable ink flatbed printers available on www.wide-format-printers.NET.

V

vacuum system, vacuum cleaning system. Some printers clean themselves via a purge by forcing ink out. Other printers are cleaned by sucking the ink with a vacuum while the printheads are parked at the service station. I have never seen an independent laboratory tests which reveals whether vacuum suck is better than purge, spit & wipe.

vacuum table is an optional part of a printer. A cheap entry level printer would tend not to have any vacuum table. A vacuum table has little holes in it that use vacuum sucking pressure to hold down the media or material. The vacuum table is placed where the media goes over. This is the area where the printheads pass back and forth. It is essential that the substrate in this area be as flat as possible, both to avoid headstrikes as well as to control the distance from the nozzles to the substrates.

variable drop; thermal printheads can eject only a drop the size that is specified by the orifice of the nozzle. But some piezo printheads, most notably those of Epson, can create drops of variable size from the same printhead. The size varies on the fly, controlled by software. Roland is generally credited with being the first company to generate variable drops from an Epson printhead. Epson itself, Mutoh, and I would guess Mimaki also very quickly copied the Roland concept in their next generation printers.

vehicle wrap is essentially the same as bus wrap but "vehicle" wrap is a more generic term. But fleet graphics can include truckside advertising which is not, technically speaking, "wrap"

venting means exhausting unhealthy VOCs or nasty odors to outside your office or workspace. Venting is what you need to do with any and all forms of solvent ink printers, whether "mild" solvent, lite-solvent, eco-solvent, other pseudo-solvents or full solvent. I commend Seiko for providing vent openings on the top of their ColorPainter H-104s.

vinyl, polyvinylchloride PVC, can stretch slightly so is useful to conform to rivets and other comparable parts of vehicles that need to be wrapped. Other materials such as polyester can't conform (stretch) as well.

VinylJet, from Encad, was a project of the Kodak Company just long enough to go out of business. VinylJet used an atypical ink from DuPont. Several ink chemists have suggested that HP latex ink looks like a further and more sophisticated development of this or a similar DuPont ink. As expected, HP says not; besides, HP has its own labs to take anyone else's ink further. Encad and Kodak did not have that much experience or personnel to handle inks for vinyl in-house. But nonetheless, it would be interesting to compare, feature by feature, what the two inks (DuPont ink for Encad VinylJet and today's HP latex ink) require for curing (such as substantial heating after printing). For more comments see Aqua-Vinyl in this glossary

viscosity. High viscosity is a thick ink that is not fully fluid. Honey or syrup might be considered to have a medium viscosity. Low viscosity means a free flowing "thin" liquid.

Seiko ColorPainter H-104s vehicle wrap at GDS printing company, Indiana.

Encad VinylJet printing samples at ISA 03.

vision film. What is normally intended is one-way, see-through vision film, namely bus wrap that goes over the windows. Of course you can also desire vision film for windows of an office building or car dealership. The material is usually PCV. A good definition and description is found on www.clearfocus.com/faqs.html. May also be called simply window vision film.

But vision film may be defined differently depending upon printer, ink, and vendor. The Noritsu Mytis dye sublimation printer offers white vision film in matte and glossy as well as backlit vision film. Their use of the term is atypical.

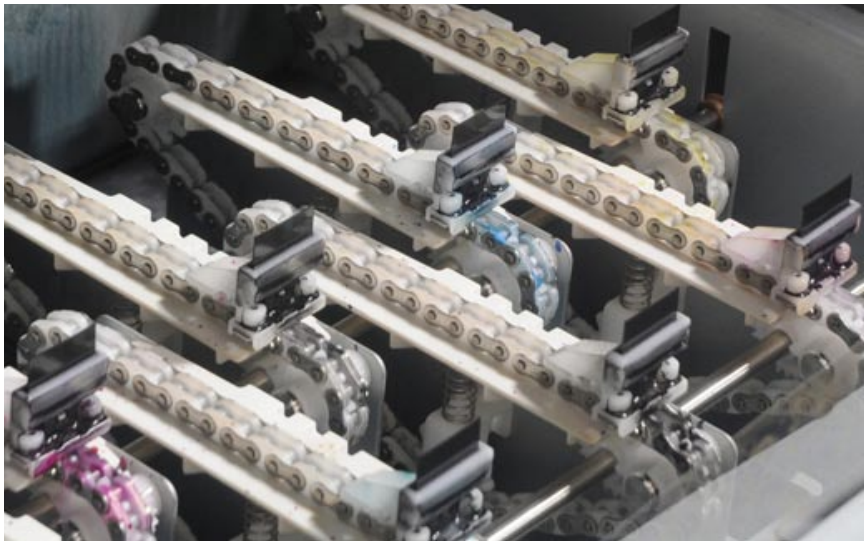
VOC emissions, Volatile Organic Compounds. Volatile means the substances turn into another form, in this case into a vapor. Although even some water-based inks may have some VOC emissions, it is primarily true solvent or mild solvent inks that have lots of these nasty volatile organic compounds. VOCs are unpleasant for health of humans and the environment also. Eco-solvent inks are supposed to have no VOCs. UV-curable inks have low VOC emissions. VOCs have several unpleasant effects; one is they help in forming ozone. Some EPA info on VOCs and HAPs is available in www.pmai.org/environ/library/pdf/CAA_Digital_Imaging.pdf.

W

waste ink tank; some printers spit or purge out so much ink to clean their nozzles that these printers need a waste ink tank to hold the expelled ink. Allegedly the waste ink tank in Epson printers pre-2003 had to be changed by a technician, an expensive and unpleasant event.

wipe, as in "spit, purge, and wipe," a cleaning routine. The printer spits a small amount of ink or purges a larger mass of ink. Hopefully this pushes out any impurities or dried ink. But some of this gunk may remain on the nozzle plate, so a wiper blade is used in more sophisticated systems to wipe off the printhead.

wiper blades are used to clean gunk off the printhead nozzle plate at the end of a purge and wipe session.



Seiko ColorPainter H-104s wiper blades, 2009.

X

Xaar is a company in England which makes industrial piezo printheads. Xaar printheads are competitors of Spectra, Hitachi, Toshiba Tec (TTec), and to a slight degree a competitor of Epson. Whereas Spectra piezo heads last a long time (often years), Xaar model 128 heads have the reputation for not lasting very long. Early Xaar printheads tended to be low dpi, since not much dpi is needed for billboards or anything seen at a great distance. The typical Xaar head of circa year 2000 had about 180 dpi native resolution. But Xaar holds most of the patents for industrial piezo printheads, so the company survives despite the weak features of its early heads. Ironically, Seiko, Konica, and Brother have used Xaar patents to make printheads that produce better quality than Xaar's own heads, so it was only a matter of time for Xaar itself to improve the output quality of their own heads. Today (2009) and actually for the last three years, the newer models of Xaar printheads are greatly improved over earlier models. Indeed the Xaar 1001 head is being used on the more sophisticated one-pass UV-cured printers.

Nicholas at XAAR factory visit 2008.

Appendix A

Common Kinds of Signs that your Print Shop can Sell

Signs can be employed in the following situations

- advertising signs,
- balloons
- directional signs,
- displays
- exhibits
- safety notices,
- identification,
- Recognition of achievement, such as “employee of the month”
- Display of mottoes, logos for brand identification
- inflatable graphics
- promotional signs,
- aisle markers,
- floor graphics (be sure to have anti-slip lamination, and insurance…)
- seasonal, holiday themes (Christmas, Easter rabbits, etc).
- sails on sailboats
- stadium signage (see event signage, spots signage)
    - Sponsor signs at sports events
- display window, storefront
- poster,
- pole signs, may also be classified as pole banners
- POP, point of purchase, also known as Point of Sale
    - sales,
    - specials,
    - bargains,
    - prices,
    - promotions,

- counter displays,
- floor graphics
- mobiles,
- warehousing signs,
- packaging, including proofs
- tradeshow signage is an industry into itself

Sources and Resources

Also check out the multitude of glossaries cited in the bibliography of the FLAAR glossaries on

- General inkjet printing
- UV-curable inkjet printers
- Giclee inkjet printing
- Glossary of inkjet media
- Glossary of RIP software for inkjet printers

The three leading trade magazines also have useful reading on solvent printers. I especially recommend articles on ink by Dr Ray Work in Digital Graphics magazine.

http://bcc.ecnext.com/coms2/summary__0002_002381_000004_000016_0002_1
Lists of publications; no glossary, but lots of jargon that needs to be described.

www.decotechgroup.com/library_docs_html/tech_bull_pp_glossary/tech_bull_pp_glossary.htm
A glossary of common terms used in pad printing. No illustrations.

www.physikinstrumente.com/tutorial/4_7.html
"New Piezo Tutorial." A glossary of a dozen succinct terms relative to generic piezo technology.

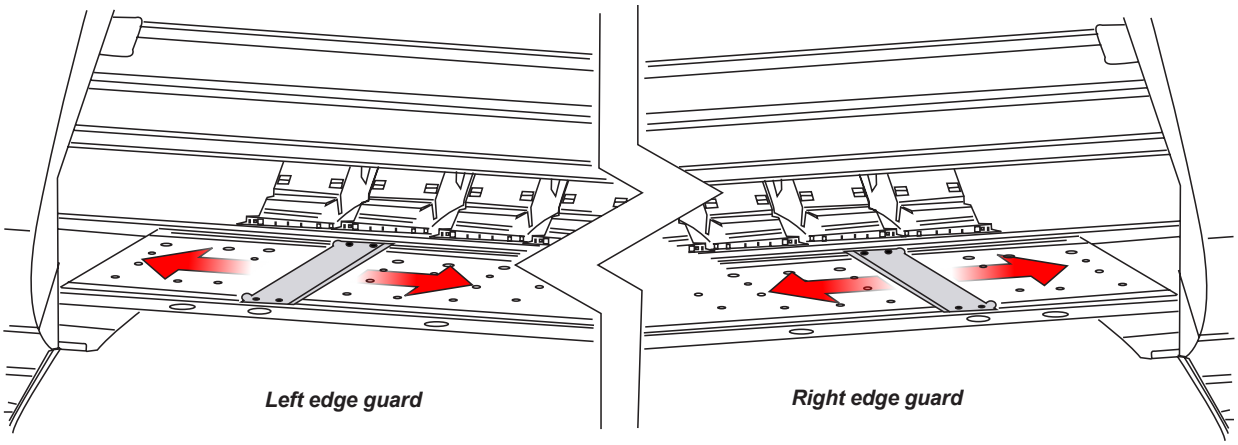
www.seyboldreports.com/SRPS/free/0ps24/P2412009.HTM
Describes a Vutek digital airbrush printer, 1996.

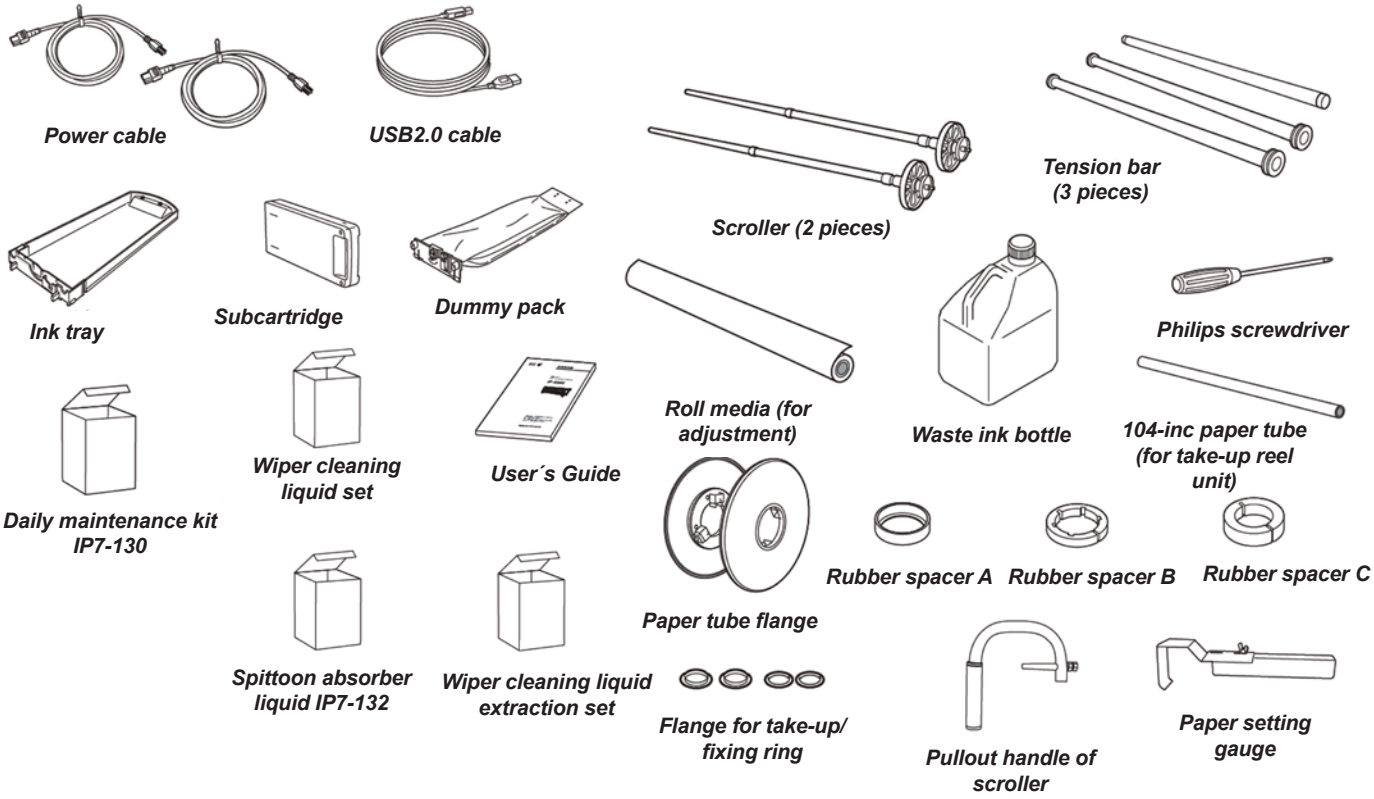
www.signware.com/technology.html
One page illustrated glossary of a printhead. However they do not identify whether it is a Xaar or Spectra, nor which model number.

Appendix B

Seiko ColorPainter H-104s printer, front and back views. Site visit 2009. Numbered the principal parts of it.

1. LCD screen
2. Hood
3. Media
4. Heater
5. Take-up spindle
6. Optional air cleaner; exhaust attachments to get rid of ink smell discharged during printing.
7. Waste ink bottle.





Items that come in the ColorPainterH-74s and H-104s printer box. Image extracted from the Seiko I Infotech Inc. User's Guide, ColorPainter H-74s and H-104s (Solvent Ink Color Inkjet Printer IP-7700 and Color Inkjet Printer IP-7900).

Most recently updated June 2009.
Previously updated July 2004. Updated January 2007.

Complete Workflow for wide-format inkjet printing

Once you have a UV-curable flatbed, hybrid, combo, or roll-to-roll printer, there are several other components of the workflow that you need:

- RIP software
- an understanding of color management and ICC color profiles
- and an awareness of when and whether you need lamination or top coating

Every printer manufacturer will tend to say that the output with their inks do not require lamination….

- But what about floor graphics ?
- What about vehicle wrap ?

And what about covering over cure-banding and banding from feeding inaccuracy ?

- What about the fact that 75% of UV-cured printers can't produce gloss and some not even satin surface appearance?

Hmmm,
So now you know why FLAAR is evaluating liquid top-coating equipment and studying film laminators and liquid laminators. Indeed one of the several new staff that we hired is an experienced printshop operator with practice on VUTEk solvent printers and Seal brand liquid laminators.

Our first major research project is on the UV-cured liquid top coating system of Drytac. We found a printshop that had bought a the #1 leading brand of coater, found that it did not work to his expectactions. So he looked around at several trade shows and then bought a Drytac UV coater.

Here is the printer and coater operator, Jacob Duquenne. Notice that FLAAR actually makes printshop inspections and actually checks out how the equipment performs.

The print shop is a 6-hour round trip drive from the FLAAR office in St Louis, so it was relatively easy to reach. You can also download the FLAAR Reports on the other equipment at this printshop: Seiko ColorPainter H-104s.

And, while we were preparing the Seiko evaluation, we dedided to issue a complete glossary on solvent printers: eco-, mild-, lite-, and bio-solvent.

FLAAR sent Dr Nicholas Hellmuth and one Technical Writer to inspect the liquid coating system, spending two days at the printshop in Illinois. The FLAAR Report is now coming out this week or next week.

So whether you print giclee, or décor, or signage of all sizes, shapes, and materials, you can now look forward to the FLAAR Reports bringing you innovative reports on more than just printers.

If you need information now (since the FLAAR Report will take another week or so to finish) you can contact Drytac for spec sheets and information on applications: toll free (USA) **1-800-975-6336**, Toll free Canada: **1-800-353-2883**

If from elsewhere in the world, write info@drytac.com

To see the FLAAR video on our inspection for the evaluation, click here

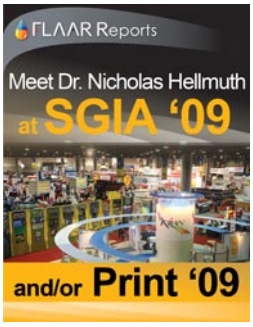
Here is Nicholas interviewing the owner of the coater. Previously he had bought the biggest name brand, but their UV coater did not function adequately and he asked them to take it back. Then he spent time checking out every single other brand: he selected the one you see here.

What's next at FLAAR ?

Our report on Caldera RIP is being updated. We are receiving more training on the HP latex ink printers, since more people are writing asking FLAAR about this ink than we anticipated. FLAAR was initially trained on HP latex ink first in Israel and then at the world headquarters of Hewlett-Packard wide-format printers in Barcelona (all before the printer was even released to the public or shown at any trade show).

To meet Nicholas and ask questions directly, you can attend his lecture at Sign Africa in Johannesburg in early September or at Print '09 in Chicago (Sept. 14th). Or you can make a reservation for consulting with him at SGIA in New Orleans.

If you are in Europe, you can make a reservation for consulting with Dr Hellmuth at VISCOM Madrid, VISCOM Dusseldorf or VISCOM Milano.



click here

Reality Check

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

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

Licensing Information

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

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

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

Update Policy

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

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

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

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

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

Please Note

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

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

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

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

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

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

Citing and Crediting

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

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

The material in this report is not only copyright, it is also based on years of research. Therefore if you cite or quote a pertinent section, please provide a proper credit, which would be minimally "Nicholas Hellmuth, year, www.FLAAR.org." If the quote is more than a few

words then academic tradition would expect that a footnote or entry in your bibliography would reference the complete title. Publisher would be www.FLAAR.org.

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

Legal notice

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

Advisory

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

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

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

Or the product may indeed have a glitch but one that is so benign for us, or maybe we have long ago gotten used to it and have a workaround. And not all glitches manifest themselves in all situations, so our evaluator may not have been sufficiently affected that he or she made an issue of any particular situation. Yet such a glitch that we don't emphasize may turn out to be adverse for your different or special application needs.

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

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

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

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

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

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

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

The user is advised to test products thoroughly before relying on them. We do not have any special means of analyzing chemical contents or flammability of inks, media, or laminates, nor how these need to be controlled by local laws in your community. There may well be hazardous chemicals, or outgassing that we are not aware of. Be aware that some inks have severe health hazards associated with them. Some are hazardous to breathe; others are hazardous if you get them on your skin. For example, some chemicals such as cyclohexanone do not sound like chemicals you want to breathe every day. Be sure to obtain, read, and understand the MSDS sheets for the inks, media, and laminates that you intend to use. Both solvent, eco-solvent, and UV-curable inks are substances whose full range of health and environmental hazards are not yet fully revealed. It is essential you use common sense and in general be realistic about the hazards involved, especially those which are not listed or which have not yet been described. FLAAR is not able to list all hazards since we are not necessarily aware of the chemical components of the products we discuss. Our reports are on usability, not on health hazards.

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

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

Results you see at trade shows may not be realistic

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

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

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

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

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

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

Factors influencing output

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

Actually you may have people with even more experience than we do, since we deliberately use students to approximate newbies. FLAAR is devoted to assisting newcomers learn about digital imaging hardware and software. This is why Nicholas Hellmuth is considered the "Johnny Appleseed" of wide format inkjet printers.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Counterfeit parts are a problem with many printers made in China

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

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

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

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

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

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

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

Be sure to check all FLAAR resources

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

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

Acknowledgements

With 12 employees the funding has to come from somewhere, so we do welcome project sponsorship, research grants, contributions that facilitate our educational programs, scholarships for co-op interns and graduate students, and comparable project-oriented funding from manufacturers. The benefit for the end-user is a principle called academic freedom, in this case,

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

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

Besides, it does not take any money to see which printers and RIPs function as advertised and which don’t. We saw one hyped printer grind to a halt, malfunction, or otherwise publicly display its incapabilities at several trade shows in a row. At each of those same trade

shows another brand had over 30 of their printers in booths in virtually every hall, each one producing museum quality exhibits. Not our fault when we report what we see over and over and over again. One of our readers wrote us recently, "Nicholas, last month you recommended the …… as one of several possible printers for our needs; we bought this. It was the best capital expenditure we have made in the last several years. Just wanted to tell you how much we appreciate your evaluations…."
FLAAR is a non-profit educational and research organization dedicated for over 36 years to professional photography in the arts, tropical flora and fauna, architectural history, and landscape panorama photography.

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

The FLAAR web sites began initially as the report on the results of these studies of scanners. Once we had the digital images we began to experiment with digital printers. People began to comment that our reports were unique and very helpful. So by 1999 we had entire sections on large format printers.
FLAAR has existed since 1969, long before inkjet printers existed. Indeed we were writing about digital imaging before HP even had a color inkjet system available. In 2000 FLAAR received an educational grant from Hewlett-Packard large format division, Barcelona, Spain, for training, for equipment, and to improve the design and navigation on the main web sites of the FLAAR Network. This grant ran its natural course, and like all grants, reached its finishing point, in this case late 2005.

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

We thank MacDermid ColorSpan (now part of HP), Hewlett-Packard, Parrot Digigraphic, Color DNA, Canon, Gandinnovations, and other companies for providing funding for technology training for the FLAAR staff and our colleagues at Bowling Green State University in past years and for funds to allow us to attend all major international trade shows, which are ideal locations for us to gather information. We thank Sun LLC, Caldera, Raster Printers (EFI Rastek), DEC LexJet, DigiFab, Barbieri electronic, Seiko, Mutoh Europe, IP&I, Dilli, Yuhan-Kimberly, GCC, Grapo, Durst, and WP Digital for providing funds so that we can make more of our publications free to end-users. During 2000-2001 we had grants to cover all the costs of our publications, and all FLAAR Reports were free in those early years. As that early grant naturally expired after a few years, we had to begin charging for some of our reports to cover costs. Now (in 2009), we are seeking corporate sponsorship so we can gradually make another 20% of our publications free to our readers.

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

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

Barbieri electronic (color management), Caldera (RIP), ColorSpan, DEC, Durst, Gerber, Grapo, IP&I, Mimaki USA, Mutoh, Dilli, GCC, NUR, Oce, Shiraz (RIP), Sun, Teckwin, VUTEk, WP Digital, Xerox, Yuhan-Kimberly, Zund have each brought FLAAR staff to their headquarters and printer factories. Bordeaux, InkWin and Sunflower ink have brought us to inspect their ink manufacturing facilities and demo rooms. We have visited the world headquarters and demo rooms of HP in Barcelona and received informative and helpful technology briefings. We are under NDA as to the subjects discussed but it is important that we be open where we have visited. Mimaki Europe has had FLAAR as their guest in Europe to introduce their flatbed UV printer, as have other UV-curable manufacturers, again, under NDA as to the details since often we are present at meetings where unreleased products are discussed. Xaar has hosted an informative visit to their world headquarters in the UK. You don't get this level of access from a trade magazine writer, and I can assure you, we are provided much more detailed information and documentation in our visits than would be provided to a magazine author or editor. Companies have learned that it's a lot better to let us know up front and in advance the issues and glitches with their printers, since they now know we will find out sooner or later on our own. They actually tell us they realize we will find out on our own anyway.

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

We thank 3P Inkjet Textiles and HP for providing inkjet textiles so we could learn about the different results on the various textiles. IJ Technologies, 3P Inkjet Textiles, ColorSpan, Encad, HP, Nan Ya Pepa, Oracal, Tara and other companies have provided inkjet media so we can try it out and see how it works (or not as the case may be; several

inkjet media failed miserably, one from Taiwan, the other evidently from Germany!). We thank Aurelon, Canon, ColorGate, ColorSpan, ErgoSoft, HP, PerfectProof, PosterJet, Onyx, Ilford, CSE ColorBurst, ScanvecAmiable, Wasatch and many other RIP companies for providing their hardware and software RIPs.

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

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

We really liked some of the results whereas some of the other products were a bit disappointing. Providing samples does not influence the evaluations because the evaluators are students, professors, and staff of Bowling Green State University. These personnel are not hired by any inkjet printer company; they were universities employees (as was also true for Nicholas Hellmuth). The testing person for the HP ColorPro (desktop printer) said he frankly preferred his Epson printer. When we saw the rest results we did not include this 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, Seiko, Mutoh, and Mimaki). This is because piezo has definite advantage for some applications; thermal printheads have advantages in different applications. Our reviews have universal appeal precisely because we feature all competing printhead technologies. Every printer, RIPs, inks, or media we have reviewed have good points in addition to weaknesses. Both X-Rite and competitor GretagMacbeth provided spectrophotometers. Again, when all sides assist this program there is no incentive to favor one by trashing the other. Printer manufacturer ad campaigns are their own worst enemy. If a printer did not make false and misleading claims, then we would have nothing to fill our reviews with refuting the utter nonsense that is foisted on the buying public.

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

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

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

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

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

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

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

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

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

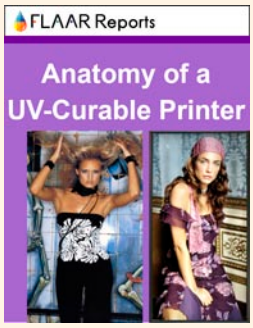
A modest portion of our income comes from our readers who purchase the FLAAR series. All income helps continue our tradition of independent evaluations and reviews of inkjet printers, RIPs, media, and inks.

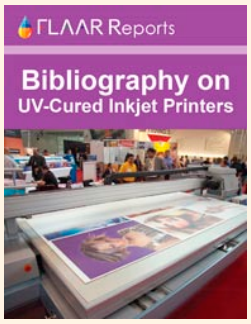
These are some of the most

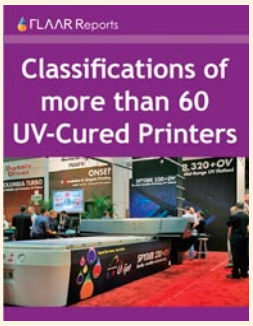
Recent FLAAR Reports (2007-2009)

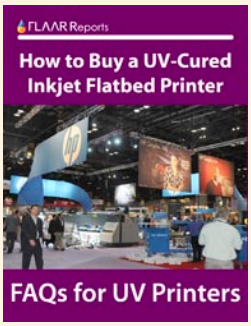
You can find these and more reports at: www.wide-format-printers.NET

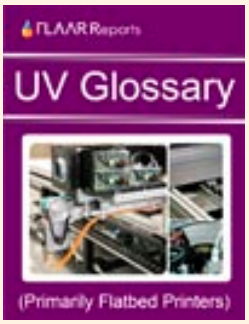
Introduction to UV Curable Inkjet Flatbed Printers

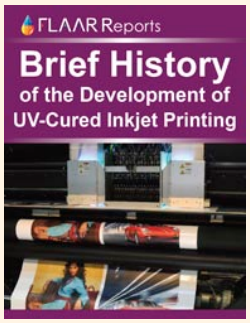


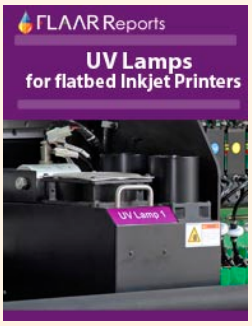


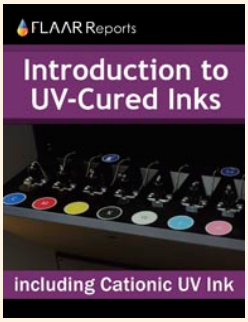




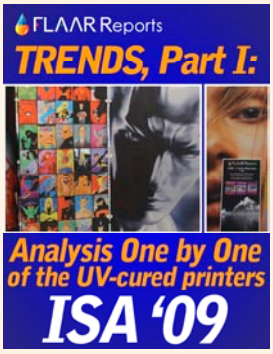


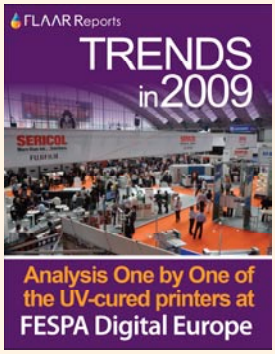






Comments on UV Inkjet Printers at Major Trade Shows 2007-2009



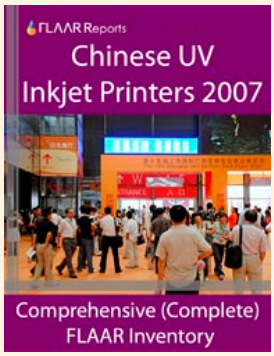


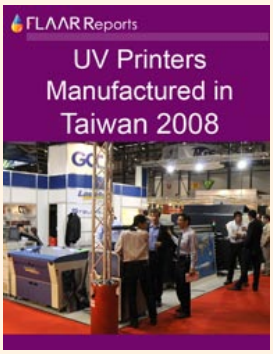
These are some of the most

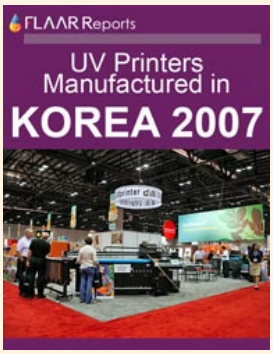
Recent FLAAR Reports (2007-2009)

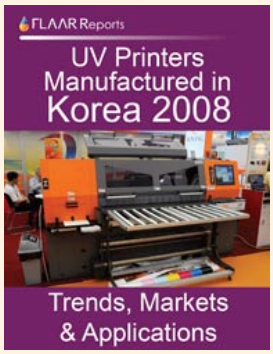
You can find these and more reports at: www.wide-format-printers.NET

UV Printers Manufactured in China, Korea and Taiwan









Most recent UV Printers