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Classifications of more than 100 UV-Cured Printers

By price level, status (alpha stage, beta stage, defunct, etc) and other practical and useful categories

Nicholas M. Hellmuth

Classifications of UV-Curable printers



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Classifications of UV-Curable printers

Introduction

Because there are more than 60 models of UV-curable printers by more than 30 manufacturers, end-users are faced with insurmountable obstacles in trying to figure out the difference between any two models. Over and over again print shops send us e-mails asking for our help in deciding which make and model they should purchase.

We list here about 90% of all current model UV printers. There are many Chinese UV printers which are not listed in part because they are not true production models (they are one-of-a-kind prototypes made in the hope of finding an OEM partner or distributor that might want to sell them). Other Chinese flatbeds are pictured only on web sites and are not even exhibited at the largest annual trade show in China (Shanghai, every July).

All UV printers from Taiwan and from Korea are listed in a separate FLAAR Report.

Some buyers decide on productivity: which are the most productive printers. Photo labs may ask which brands offer the highest resolution. Other print shops are just starting and need the absolute cheapest machine, no matter how slow it is. Owners of larger print shops struggle with deciding between a Durst and a Vutek combo printer or between a NUR and a Gandinnovations flatbed. Sign franchises tend to ask FLAAR whether they should consider a ColorSpan, a Raster Printers, Gerber, or Zund 215.

To assist our readers in reaching an informed decision, we have over 60 publications. Some, such as the present PDF, focus on comparing by category. But when you are about to spend your hard-earned money on actually buying a printer, you need to obtain the specific FLAAR Report on each brand that you are considering. The FLAAR Reports cost less than a single liter of UV ink, so are a good investment. Actually you can purchase the entire reference library of FLAAR Reports for less than the cost of an extended warranty.

In the present report, following is a classification simultaneously by machine complexity or simplicity and price. It is not realistic to list actual prices since the price varies by country, by season, and by market conditions.

We list here primarily those UV printers that are available for public inspection at leading trade shows in the US and Europe. Printers that are shown only in their home country, and are not yet shown in Europe, are not listed here because the average print shop would not want to buy such an unfinished printer.

If manufacturers find their printers in a category that is not how then envision their printer, if we can see the printer at a factory or site-visit case study or at least if we can have access to the site-prep guide and User's Manual, we can consider changing the category. But for printers where little to no information is available, we categorize them as best as possible. Another option is for a manufacturer to facilitate our visit to their main demo room so we can better fit their printer into the most appropriate category.

This particular report is specifically a list. A list implies a simple listing. For more details you need to go to the specific report on each printer (when information and access to the printer is available). If manufacturers disagree with the categorization, they should consult the glossary that defines combo (moving transport belt) and hybrid (old-fashioned platen with pinch rollers, grit rollers, or tension system (no moving transport belt).

The first consistent definition of UV Printer Shape and Function

FLAAR is utilizing the following classifications, based on common-sense features.

- Hybrid, usually based on a traditional solvent printer concept
- Combo, usually features a transfer belt ("conveyor belt")
- Dedicated flatbed
- Dedicated roll-to-roll
- Dual structure (a new classification)

A **hybrid design**, several years ago, was a printer that originally was a solvent ink machine and merely adds a table at the front and rear. Material is moved by a pinch roller pushing down on the material whereby the grit roller underneath the material moves the material by nature of its gritty surface. Downside of this low-priced design is that slippery or heavy materials may not be moved at the same rate of speed as inkjet media with a special coating that adds the necessary friction.

A **combo** is more sophisticated and replaces the rigid smooth-surfaced platen with a moveable transport belt. A combo design can better handle thick and rigid material; a hybrid is made for roll-to-roll and accepts flat rigid material based on the add-on tables. A combo design usually does not have a pinch roller that works together with a grit roller.

A dedicated flatbed is just that, it is flat! And it is dedicated to handling flat material.

A **dedicated roll to roll** means what it says: it prints only roll-to-roll material. The new WP Digital Virtu RR50 is the latest example. The NUR Expedio 5000 was the first of this classification, back at DRUPA 2004.

- The Raster Printers (Rastek) H700uv is a combo, not a hybrid.
- The Zund 250 "combi" printer is a hybrid, not a combo (it is also a dedicated flatbed if you add this option).
- A "ComboJet" shown in China is neither a combo nor hybrid: it is a traditional flatbed and its next iteration will be a dual-structure system (see below).

A **dual-structure** is a new classification because true (dedicated) flatbeds now have an optional "separate" roll-toroll option that can be added (or subtracted). Oce Arizona 350 GT is the best known; Gerber ion X is another that is becoming popular. More are in development around the world, so we need an adequate term to describe them. These are NOT a combo and are NOT a hybrid. They are dual-structure.

We can classify only those printers that we have seen, based on seven years of attending countless trade shows across Europe, USA, and the Middle East (Dubai). Many printers have never been shown outside China or Korea, so we lack details. We also lack information on those printers we have not seen because they were withdrawn quickly (never really finished, or the company went bankrupt, such as Hypernics in Korea).

The classifications above may be used by any trade magazine or industry publication or PowerPoint. Credit to source is appreciated (FLAAR Reports, www.large-format-printers.org).

The list of UV printers by category below, is based on 10 years in the industry and tens of thousands of dollars of being present at trade shows around the world. If a trade magazine or PowerPoint presentation wishes to utilize this list, it would be appropriate to request permission from FLAAR Reports at <u>FrontDesk@FLAAR.org</u>. There is a nominal courtesy fee for publication of FLAAR material in trade magazines and PowerPoint presentations.

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Entry Level Chinese, primarily hybrid design

Anhui Liyu Lyric Eureka UV 1808UV

Azon UV-Jet 1600FB-R White (Honghua, Infiniti 1600 with one lamp)

Design DU250-BZ

DuPont Cromaprint 18uv, now rebranded as DEC Legend 72HUV.

Flora LJ1800, (the prototype for what was sold as Raster Printers, whose version was upgraded in the US) **Infiniti 1612SUV**, one lamp, rudimentary (Xterius in Europe, Fina in US, Aprint in China)

Legend 72HUV, updated version of the former DuPont Cromaprint 18uv, at lower price.

Qumtum F6 (so far not at any major international trade show), probably hybrid

Sun Neo UV (rebranded printer offered in Russia and adjacent countries)

Teckwin TeckSmart UV1600 and UV2500

Teckwin TechThunder (similar to TeckSmart but with different printheads) Xterius 16UVs (Infiniti Europe) Yaselan Picasso UV, YSL-D1600FBUV Yishan YS2506-DJ

Eurotech (formerly Chinese made solvent printers retrofitted in Turkey, now increasingly made in Turkey) Until you can see CNC machines producing every part actually in a factory, it is a challenge to know where some UV printers are actually "manufactured". But their new UV printers are designed and assembled in Europe (Turkey).

See separate FLAAR Reports on Chinese UV printers for further information on status of Chinese-manufactured UV printers.



DEC Legend 72HUV at a demo-room visit, 2008.



Sun Neo UV LED at SGIA 07.

¹When I first met the capable team of Sun LLC at Gulf Print '07 (Dubai), my understanding was that the printer they exhibited was retrofitted from an Infiniti. Infiniti is not a manufacturer, it is a loosely used brand name of machines from at least two (or more) different Chinese factories. I am checking to find out who manufactures, and who distributes, the chassis of the Sun LED uv printer. As soon as we have this information this page will be updated.

Entry level UV; primarily hybrid style (flat platen, pinch rollers, grit rollers)

ColorSpan 72uvR and 72uvX (two FLAAR Reports), hybrid ColorSpan 5440UV, hybrid (now renamed HP Designjet) ColorSpan 5460UV, all had multiple issues in beginning. ColorSpan 5445UV ColorSpan 5465UV GCC StellarJET183UVK Gerber Solara (slower than its competitors), hybrid HP Designjet 35500 and 45500 (former ColorSpan 5440uv series) Mimaki UJV-160 Roland VersaUV LEC-300, is not a hybrid, but a tiny rollto-roll.



GCC StellarJET183UVK at ISA 09.



ColorSpan 5440uv renamed HP Designjet H45500 UV hybrid printer at HP Pre--DRUPA event held in Israel 08.

Entry-level, primarily Combo

Sun Neo UV LED Evolution (manufactured in Russia) GCC StellarJET 72, combo version of StellarJet 183uv Zund 215 (three FLAAR Reports), combo

Entry Level dedicated flatbed

Gerber Solara ion^x Raster Printers Daytona T600, now EFI Rastek T660



Gerber Solara ion^x at ISA 09.

Entry level Chinese-made combo printers

Creation LJ-2508U (LongJet-2508U), primitive alpha stage Creation LJ-2508U (LongJet-2508U), primitive alpha stage EFI Rastek H700 previously known as the Raster Printers Daytona H700UV, rebranded, improved Flora F1 180UV. EFI Rastek H650, assembled in China, but design and concept is from EFI Rastek. Flora F1 180UV (since SGIA 2006), also named Flora F1-180UV-BA



EFI Rastek H700uv.

Mid-Range, primarily hybrid

Keundo SupraQ 3300UV, made in Korea Neolt, made in Italy Milano, made by Neolt in Italy; sold by Triangle Mutoh Zephyr

Mid-Range European UV

Durst Rho 600 Pictor, combo Grapo Octopus II (could also be considered entry-level), combo Neolt (fully mid-range, not really entrylevel in size), hybrid. Triangle (INX) Milano, various widths, made in Italy (same as Neolt).



Grapo Octopus II UV combo printer at SGIA '09.

Mid-range Taiwan UV printers, Combo

Eastech (no longer available) Fuzion (Graphics One) same as Eastech GCC, StellarJET 250uv GCC, StellarJET K100UV GCC, StellarJET K72UV, but it would be classified in the entry-level range.

Mid-range Chinese manufactured combo printers

Flora FUV 2200 and FUV 2214 (discontinued, was the basis for the DuPont models) **DuPont Cromaprint 22UV** (similar chassis as Flora FUV but redesigned by DuPont)



GCC StellarJet K100UV at DRUPA Düsseldorf, 2008.

Mid-range Korean and comparable printers (most combo design)

Agfa: Anapurna L, Agfa XL (similar to Dilli NeoPlus) Agfa: Anapurna XL2 series (similar to Dilli NeoVenus) Agfa: Anapurna M, M4f, Mv, M2 Dilli (D.G.I.), Neo (various models were first from D.G.I, then all from Dilli subsequently) Dilli Titan (and Agfa :Anapurna M) DYSS Lasco; by SGIA '08 renamed DYSS Apollo, two or three widths Keundo SupraQ 3300 UV (hybrid) IP&I Cube 1606UV, 1608UV IP&I Cube 260UV IP&I iCube 260UV Mutoh Cobra S65UV (same as Dilli, same as Agfa) Mutoh Cobra S100uv (same as Dilli, same as Agfa) ScreenJet 130UV (Korean, not Dainippon Screen)



Agfa : Anapurna XL² at SGIA 07.

Mid-range UV combo style printers

ColorSpan 9840uv, now HP Scitex FB910 **Eurotech**, combo, similar to VUTEk, not yet finished. **HP Scitex FB950** (updated version of ColorSpan 9840uv)

Sun Neo UV LED Evolution (designed and assembled in Russia)



ColorSpan 9840uv, now known as the HP Scitex FB910 2007.

VUTEk PressVu 200 VUTEk PressVu 320 VUTEk PV QS2000 and QS3200 VUTEk QS220, is a roller-less combo and not really a dedicated flatbed.

High-end combo UV printers

Agfa :Anapurna 100/Mutoh Cobra 100 (withdrawn, replaced by mid-range Dilli as Anapurna L and XL) Agfa :Anapurna XLS, replacement for non-functional Agfa :Anapurna 100 Durst Rhopac 160 Durst Rho 320R Durst Rho 600 Durst Rho 600 Durst Rho 700 Durst Rho 800 (and Rho 800HS, later called Rho 900) Durst Rho 1000 L&P Virtu (many models; final model was HD8) Screen Truepress Jet 2500 UV Spuhl Virtu RS25/48 and Virtu RS35 (a Swiss model for L&P; replaced by WP Digital) VUTEk GS3200 (launched ISA 2009) Zund UVjet 250 (is a unique design which we comment on later; it's really a double-row pinch-roller hybrid combined with an optional add-on flatbed bed accessory; so is not rthan a combo design) WP Digital Digital Virtu RS25 and Virtu RS35





Durst Rho 320R at ISA 2009.

Durst Rho800 at ISA 2009.



WP Digital Virtu RS35 at ISA 2009.

Chinese dedicated flatbed printers, in prototype, alpha, or beta stage

Design DFU130-BZ240 CALCO UV flatbed printer (sic) Hanky FB-500, dedicated flatbed from Taiwan. JFH Vista F-UV flatbed Qumtum P2 Yishan (Digirex, via PIMMS, Turkey), still not finished as of 2006 Yishan YS2407-EB, similar to the Digirex



Design DFU250 at Shanghai 08.

Yishan YS-2407-DL

Teckwin, prototype of moving-table concept, in demo room of Teckwin factory Yinghe-UV-FLAT-1224

I am aware of three more Chinese flatbed UV printers under development: see FLAAR Reports on Shanghai '08 and on Chinese UV printers in general.



Skyjet UV flat-bed at Shanghai '08.

Dedicated flatbed Chinese printers which are available in US and Europe

ESS, Combo Jet

SkyJet FlatMaster, Chinese UV flatbed printer available in Europe.

SkyJet GlassMaster, based on the FlatMaster, but with special mechanism to handle heavy glass planks.

Teckwin TeckStorm Teckwin TeckStorm R Yishan, exhibited at ISA 2009 as Chin E. Technologies, X-Press



ESS, Combo Jet at ISA 09.

Teckwin TeckStorm R at ISA 09.

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Dedicated flatbed design

Bergstein BE-1000uv Dilli Neo Deluxe (dedicated flatbed) DYSS UV RF2600 series (is a giant combo, so large that it may function also as flatbed) Gerber Solara ion X, V, Z Grapo Manta KM8/720 UV (CMYK) Grapo Manta KMW-5/720 UV (CMYK+W) Inca Eagle Inca Spyder 150 Inca Spyder 320, various models • Inca Spyder 320

- Inca Spyder 320-e
- Inca Spyder 320+
- Inca Spyder 320-8 series
- Inca Spyder 320Q
- Inca Spyder V

Inktec Jetrix

Mimaki JF-1631 and JF-1610; originally Mimaki IPF 1326, due to issues is being replaced.

Mimaki JFX-1631, launched as prototype at ISA 2009 Neolt, SuperJet Flatbed 160x100 Oce Arizona 250 GT Oce Arizona 350 GT Raster Printers Daytona T600UV; replaced by EFI Rastek T660 Screen Truepress Jet1600UV-F, an OEM version of Mimaki JFX-1631, identical except for color. SwissQPrint Oryx **Teckwin TeckUV S3000** Teckwin TeckUV S2400 (smaller version of S3000, exhibited at Shanghai '07) Teckwin TeckUV S3000 (shown at FESPA '07) Teckwin TeckStorm, replaces all their earlier dedicated flatbeds. Vega 4000, 8000, 16000, 3200, distributed by One Solution Zund 250, actually is a dedicated flatbed with its unique optional table.



Dr. Hellmuth evaluating the Dilli Neo Deluxe.



Grapo Manta at factory visit 09.



Gerber ion^x dedicated flatbed at factory visit '08.



EFI Rastek T660 at ISA '08.

High-end dedicated flatbed

| Gandinnovations Jeti UV, several sizes and models are available Jeti 3150 X-2 Jeti 1224 (4x8') Jeti 2030-48 (2x3 meters) NanoJet (tried to compete with Oce Arizona 250 for quality) | NUR Tempo II, Tempo Q (dual intent but really primarily just a flatbed) Oce Arizona T220uv (withdrawn, well built but too slow and cumbersome) Oce Arizona 350 XT PIT Sprint II (failed to be finished) Scitex Vision VEEJet+ (HP Scitex FB6300; the HP |
|--|---|
| Nanojet II (launched in 2009) | version was never really launched) |
| Inca Columbia | HP Scitex FB6500 , the HP replacement, with X2 heads, |
| Inca Columbia Turbo | for the old VEEjet+ (all these Scitex printers were cancelled |
| Inca Onset | without explanation, but reason was MEMS head failure) |
| Inca Onset S20, smaller version | HP Scitex FB7500, still in prototype stage |
| Lüscher JetPrint (cancelled without any admission of | VUTEk DS, only a prototype. |
| issues) | WP Digital Virtu RS25 and RS 35 (yes, also a |
| Meital 3000-10, experimental only at DRUPA 2008; now | dedicated flatbed if you tell belt to stop). |
| Meital 302 | |





Gandinnovations Jeti 3150 X-2 at SIGN Africa 2008.

Dual structure combo (a combo that can also print X-Y as dedicated flatbed)

WP Digital Virtu RS25 and RS 35 (yes, also a dedicated flatbed if you tell belt to stop).

I list the WP Digital in two classifications since it is so unique.

Niche-market Dedicated flatbed

Dilli Jupiter (Saati replacement for Aellora SureFire 1000; cancelled by Saati) Eastech Tina UV 2440 (claimed to have Epson heads; did not survive as a model long) Lotte Digital Imaging, InnoJet UV900 Mimaki UJF-605C and CII ("C-two") Screen (Dainippon Screen) Truepress Jet650UV Meital 3000-10 at DRUPA 08.



Dilli Jupiter at SGIA 07.

Dual Structure UV Printers: Flatbed with roll-to-roll attached (NOT a combo)

Gerber Solara ion, most models NUR Tempo Q, an innovative attempt but has a few quirks and issues. Oce Arizona 250 GT Oce Arizona 350 GT Oce Arizona 350 XT Teckwin TeckStorm R



Oce Arizona 350 GT at ISA 09.

Teckwin TeckStorm R at ISA 09.

Dedicated Roll-to-Roll, Chinese manufactured

Fina 3360, a former Infiniti roll-to-roll solvent printer with two UV lamps added **Flora F1-3200UV** (can also be turned into a hybrid)

Flora 2.5 meter roll to roll, being tested for sale under DEC brand name (LexJet)

Dedicated Roll-to-Roll, mid-range

Eurotech, 5-meter roll to roll; May 2009 still not finished. GRAPO Octopus BIG

Neolt SuperJetM 3200 roll-to-roll (VISCOM Italy '08) REDot (prototype 2008, not seen again) VUTEk QS3200r, dedicated roll-to-roll



REDot Monsoon.

Dedicated Roll-to-Roll, serious production

GRAPO Shark (actually a combo; not just only roll-toroll) Matan Barak3, Barak5, two widths, (also has tables to make it pseudo-hybrid) NUR Expedio (two sizes, so two model numbers, Expedio 3200 and Expedio 5000) NUR Expedio Inspiration (now HP Scitex) NUR Expedio 5000 Revolution Durst Rho 350R

Durst Rho 351R

Gandinnovations Jeti 3324 UV RTR (two sizes) HP Scitex XL2200; failed because Scitex X2 MEMS heads had problems similar to Spectra MEMS heads. ISI Bluestreak, a retrofit to UV-curing from a solventbased NUR Blueboard

VUTEk GS5000, launched at ISA 2009 **WP Digital Virtu RR50**, 5 meter roll to roll, launched at InHouse event, February 2009.

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HP Scitex XP2300 UV roll-to-roll printer (previously known as NUR Inspiration) at APPPEXPO '09 in Shanghai, China.

Matan Barak5 at GOA 08.





Durst Rho 351R at factory visit 08.

Roll-to-sheet¹

HP Scitex TJ8500, a Scitex Vision solvent printer retrofitted to handle UV inks. SkyJet Cylinder Digital Printer (eventually may become the PIT SPD)

WP Digital Virtu RR50 at InHouse event 2009.



HP Scitex TJ8500 at ISA 08.

¹ This is not a standard configuration. This is not intended to be a positive or negative statement, just a statement of fact so that you can better understand the different techniques for handling materials: true flatbed, true roll-to-roll, hybrid, and combo. This would be closest to a true roll-to-roll since it's drum obviously can't handle any flat rigid materials.

Specialized, unusually high quality (minimum 6 pt text):

Aellora SureFire (two sizes, but company went out of business Dec 2005)

Specialized, niche printers

Agfa :Dotrix for labels and prints where speed is the most important need.

Agfa :Dotrix Transcolor (new name for slightly revised model, 2008)

Agfa-Thieme M Press, digital equivalent of a milliondollar screen printing machine Augend RF20 UV, an actual printing press, web-fed Durst Rhopac for packaging materials Mimaki IPT-1616 Sun FastJet for packaging materials



Augend RF20UV printing press, front and rear view, at FESPA '07.

In-Line UV printers

These are narrow format, for labeling or decorating during manufacturing of other products. **Atlantic Zeiser Smartcure 72**, introduced at FESPA Amsterdam '09. **ITW Trans Tech InDecs 620UV Scribe** mprint SP2 100



Two narrow-format UV printers at FESPA '09: the mprint SP2 100 (left) and the Atlantic Seizer Smartcure 72 (right).

Incomplete information (not yet at any US or German or Italian or UK trade show)

(not yet at US or German or Italian or UK trade show) **Ardeje 1560Z UV**, formerly the Ardeje One **Dilli Neo Deluxe** (dedicated flatbed) rarely exhibited. **HP Scitex 6300 and FB6500**, replacements for aging **VEEjet+** JFH Vista F-UV flatbed QUMTUM F6 UV Qumtum P2 Sumitomo 3M UV, rebranded

Rebranded, identical to original printer with no changes other than name

Nu-VTEK (Teckwin Tecksmart rebranded by Nu Sign in California)

Prototypes (not yet in Alpha State)

Still in Alpha or Beta Stage

Alpha Stage (shown at one trade show but not at others)

Most Chinese flatbed UV printers are still in alpha stage.

Screen Truepress, both models are in late alpha or early beta stage still.

Beta stage (still unfinished in 2008) Eastech, two different UV printers, still in Alpha stage Inktek Jetrix

Beta stage (still unfinished in 2009)

Eastech, two different UV printers Mimaki JFX-1631, replacement for aging and ailing JF-1631 RTS Flora 2.5 meter roll to roll. VUTEk QS5000r WP Digital RR50

The following UV printers are predictions based on common sense:

Inca 4x8' flatbed, needed to compete against Gandy, Oce 250, Mimaki, etc. However they seem to be going for speed with the Inca Onset model, and leaving the 4x8' market to Gandinnovations, and leaving the quality/dpi market to Oce.

Seiko will need to get their UVcured printer out soon or it will not be competitive. Their solvent printer was immensely successful, in part



DuPont Cromaprint 22uv printer at FESPA 07.

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because of help from Mutoh behind the scenes. But Mutoh is not available to assist Seiko develop a UV printer, and Seiko itself has no factory, hence no way to manufacturer anything they design themselves. The Seiko entry-level project has been cancelled and they have switched to developing a more industrial printer. Prognosis: too many different printers from too many manufacturers without enough distributors.

VUTEk, dedicated flatbed (they need one to compete against Gandy, Scitex, NUR, GRAPO, Oce, and Mimaki). So far, however, there is no evidence that their engineers are continuing, in part due to funding issues.



Seiko ColorPainter 64S solvent printer at SGIA 04. It would be advisable for the companies that stayed in the solvent printer realm to conceive a UV printer. Although solvent technology is not going to dissapear in the near future, UV printer market has more possibilities to lead to company growth, since UV technology allows a wider variety of applications.



EFI VUTEk DS series flatbed prototype exhibited at SGIA '08. This printer has not been exhibited again in most tradeshows during 2009.

We are under NDA (non-disclosure agreement) on other new UV-cured inkjet printers that we have been shown by the manufacturers and distributors. Our reports on these new printers will be issued as soon as these printers are first shown to the public at a trade show or other public event. The printers that we know about, and are under NDA about, are not able to be shown in this list until they appear at SGIA or a Viscom in Europe.

With Issues: Future Status Unknown

With Issues which may lead to change in status

Agfa M Press

Grapo Octopus, okay for roll-to-roll; may have problems with some rigid materials due to skew. **Sun FastJet**, was actively under development 2004-2007 but was not shown at FESPA '07, not even in the **Sun** booth. See FLAAR Report for report directly from the factory.



Sun FastJet at the test facility in Cambridge, England.



Mimaki JF-1631 UV at Mimaki demo-room visit, 2008.

Status probably cancelled

Ardeje, the French UV printer that has been shown only at Paris events several years back.

Luscher JetPrint. Has issues described in the FLAAR Reports. No Luscher printer was at ISA 2007; no Luscher UV printer was at FESPA '07, a major "no-show" and a direct indication that the printer has been withdrawn. Interesting is that Luscher never apologized publicly or really issued any commentary: its UV printer division simply disappeared. **Saati Jupiter**, a resurrection of the Aellora SureFire printer for hybrid UV ink. Shown at SGIA '07 but reportedly the entire project cancelled by Saati shortly thereafter.

Seiko, entry-level UV. This project has been cancelled (Seiko has no factory).



SAATI booth at SGIA 07.

Delayed, Stalled

Stalled (not ready even for 2008) HP Scitex XL2200, has issues with printhead longevity.



HP Scitex XL2200 at SGIA 07.

Delayed, not yet appeared Seiko is still working on their UV printer.

There are one or two additional UV printers that have stalled during development, but may be shown in the upcoming trade shows.

Stalled: unclear whether will be displayed

Ibertech, has not been shown anywhere; development has reportedly stalled.

UV Printers on their way into retirement

Other UV printers that were phased out in 2007

Zund 215, as of summer 2007 they are still being manufactured and sold, but by 2008 they will be phased out. They are no longer exhibited at trade shows.

Zund 250, as of summer 2007 they were also still being manufactured but Zund has indicated clearly that they will concentrate on making flatbed cutters and phase out the manufacturing of actual inkjet printers. One **Zund 250** was exhibited at VISCOM Spain '07 but it is unlikely one will be at DRUPA 2008. Too bad since it was a great printer.

Defunct UV printers

Aellora, this company went out of business December 2006 Azero CreonJet 8250 (Hypernics) Azero CreonJet UV1600 (Hypernics) Azon UV-Jet 2500-R 2W (Hypernics) DuPont Cromaprint 22uv, not shown at GraphExpo '07 nor SGIA '07. Durst Rho 350R (replaced with Rho 351R) Flora 2200, 2214 (replaced by DuPont 22) GCC StellarJet 200 (replaced during beta stage by StellarJet 250) Gerber Solara (replaced during beta stage by Gerber Solara UV2) Hypernics UV-FR2513 Hypernics HyperJet UV-F2515 **Oce Arizona 60UV** Oce Arizona T220 UV Sias (became Scitex VeeJet) Perfecta Print (became Zund 215) Zund XY-Flat (still-born or DOA, dead on arrival)



Zund 215 UV printer at factory visit 07.



Oce Arizona 60UV at SGIA 04.

Eastech tried to sell via a dealer in Cleveland and then via GraphicsOne in US and Latin America but this was not successful. The Eastech Tina looks nearly identical to their desktop sized flatbed "Magic Ink" printer (using a kind of probably solvent ink). The Tina reportedly attempted to use Epson printheads, which for UV have never (so far) been successful, especially not with that generation Epson head (exhibited SGIA 2006). Eastech will unlikely continue with UV printers due to intense competition that is better funded and has more R&D. Eastech is originally a Taiwan company but their office since 2008 is in Thailand where they are a Mutoh dealer.

Classifications of UV-Curable printers

Retired (a polite way to say printers whose day has

past)

Durst Rho 160, however the Rho 160R is new for 2006, with 3M ink.

Durst Rho 205

L&P Virtu; now that the company fizzled most of its models are "retired"

Mimaki JF-1631, JF-1610, selling from inventory but these printers had issues

Scitex Vision VEEjet+ as well as the HP replacement, HP Scitex FB6300

Vutek, several early UV models



Durst Rho 160, site visit

Delayed, postponed UV printers

Agfa : Anapurna 100; combo, same as the Mutoh Cobra 100; combo

DuPont Cromaprint 18uv. DuPont decided at least by early 2006 not to continue to import and sell printer hardware. So this model was never officially launched. It was not removed from trade shows since this removal would have warned end-users that the Cromaprint 22uv would also be discontinued (at least by **DuPont** itself directly). **JHF** (Chinese); clone of Inca Spyder

Skyjet (Chinese)

Zund 250- combi, re-launched Autumn '06 but only at limited European shows

Yaselan YSL-FB2500UV

Yishan-Digirex (shown at FESPA 05 but never again, at least not outside China)

It is notable that of the seven delayed/stalled/postponed printers, that four are Chinese. But there is also one Swiss and one Belgian UV printer that did not function (and one from Bulgaria (PIT)).

Never Made it out the Door

DJT 400, Digital Jet Technologies, heavily advertised at SGIA 2004 but never made it out the gate.

L&P Virtu HD8. Hard to know whether to classify this as "delayed postponed" or "never made it out the door" (though about five were sold and delivered before L&P evaporated and was disbanded by the new owner, WP Digital). The issue was technology problems in MEMS printhead technology (Spectra M Class heads in this case), and thus not entirely the fault of L&P Digital Technologies (though that entire entity was winding down as a functional entity in recent years and was finally blissfully phase out by the new owner, WP Digital AG, who bought Spuhl and what was left of L&P).

PIT Sprint II, a giant flatbed shown in 2005 in Germany, but it was not moving (not printing) and never appeared again.

In Preparation: UV printers you will see during 2010.

As if over 100 models were not enough, there is still more to come.

There is already another UV printer under development by a Korean company. This company presently has no UV-curable printer.

There will be new models from another Asian manufacturer, which is logical. FLAAR is under NDA with this company.

There will be a series of UV printers from a major international printer company, but I am under NDA with them, so can't describe the size, shape, details, and aspects of these printers. NDA = Non-Disclosure Agreement, a confidentiality agreement that is standard.

I do not know everything, so you can count on there being at least one other new UV printer exhibited during 2010 that I don't yet know about. There is not time to be a consultant for new products for every manufacturer out there.

Classifications of UV-Curable printers

Classification by Size, Shape, Ink, & Price

common-sense features.

- · Dedicated flatbed
- · Dedicated roll-to-roll
- · Hybrid, usually based on a traditional solvent printer concept
- Combo, usually features a transfer belt ("conveyor belt").

A hybrid design is a printer that originally was a solvent ink machine and merely adds a table at the front and rear. Material is moved by a pinch roller pushing down on the material whereby the grit roller underneath the material moves the material by nature of its gritty surface. Downside of this low-priced design is that slippery or heavy materials may not be moved at the same rate of speed as inkjet media with a special coating that adds the necessary friction.

Rebranding:

Agfa : Anapurna and Dilli are made by Dilli in Korea **CET** are rebranded from China.

Fujifilm are rebranded Oce or Mutoh or Mimaki or others. Matan is rebranded by Fujifilm in US.

Neolt and Milano printers are all made by the same company in Italy.

Dedicated flatbed

BIGPRINTER (sic) UV 2133, a new Russian-made printer (not Sun LLC).

CALCA 1204

CET, rebranded Yishan; abandoned before the year was out because of problems.

CET, rebranded Flora (RTZ) flatbed; not sold by EFI Rastek. Design DFU130-BZ240, dedicated Chinese flatbed

Dilli NeoDeluxe UVD-2506(W); at one time a UVD-3206 existed

Gerber Solara ion, dedicated flatbed together with dedicated roll-to-roll, in one unit.

Grapo Manta

HP Scitex FB6500, replacement for Scitex Vision VEEjet+ with new printheads Inca Spyder 150 Inca Spyder 320

Inca Eagle (probably no longer made) Inca Columbia Inca Columbia 220 Inca Columbia Turbo JHF Vista flatbed Lüscher JetPrint UV Mimaki UJV-110

Mimaki UJF-605c

FLAAR is utilizing the following classifications, based on A combo is more sophisticated and replaces the rigid smooth-surfaced platen with a moveable transport belt. A combo design can better handle thick and rigid material; a hybrid is made for roll-to-roll and accepts flat rigid material based on the add-on tables. A combo design usually does not have a pinch roller that works together with a grit roller.

> We can classify only those printers that we have seen, based on six years of attending countless trade shows across Europe, USA, and the Middle East (Dubai). Many printers have never been shown outside China or Korea, so we lack details. We also lack information on those printers we have not seen because they were withdrawn quickly (never really finished, or the company went bankrupt, such as Hypernics in Korea).



Design DFU130-BZ240 at Shanghai 07.



Inca Columbia Turbo Plus at ISA 08.

Classifications of UV-Curable printers

Mimaki JF-1631 and JF-1610, originally IPF-1326) NUR Tempo Q is the only dedicated flatbed that can do roll-to-roll Oce Arizona T220UV Oce Arizona 250 GT Oce Arizona 350 GT Oce Arizona 350 XT PIT Sprint II **Raster Printers Daytona T600UV** Scitex Vision VEEjet+ and its renamed version, HP Scitex FB6300 Skyair-Ship, Skyjet UV flat-bed (sic) SwissQprint Oryx, from former Zund employees. **VUTEk DS,** currently only a prototype, not even in beta stage vet. Yinghe-UV-Flat-1224 (sic), Guangzhou Yinghe Electronic Equipment Co., Ltd. Yishan YS-2407DL Yishan YS2407-EB Zund UVjet 250 (has a dedicated flatbed option)

Dedicated flatbed, but specialized

(usually meaning a small bed)

Aellora SureFire TKMP1000, 1x1 meter flatbed (replaced by Dilli Jupiter) Dilli Jupiter, a small printer with a separate UV-curing unit Lotte InnoJet UV900, 90 x 90 cm bed (circa 35 x 35 in.). Screen Truepress Jet650UV Mimaki IPT-1616

Dedicated roll-to-roll

Durst Rho 350R, Rho 351R Durst Rho 500R HP Scitex XL2200, still in prototype stage even though exhibited at SGIA Flora F1 3200 (roll to roll, but with tables could be considered a hybrid) Gandinnovations RTR Grapo Octopus X4 – 360 BIG Infiniti 3360, same as Fina 3360

Hybrid

Anhui Liyu Lyric Eureka 1808UV Azon UV-Jet 1600FB-R White (Honghua, Infiniti 1600 with one lamp) CET, attempt to bring the DuPont CromaPrint 18uv (DEC Legend) back to life ColorSpan DisplayMaker 72uvr ColorSpan DisplayMaker 72uvx (new as of Viscom Düsseldorf, Oct 2005). ColorSpan DisplayMaker 98UVX ColorSpan 5440UV ColorSpan 5460UV



Zund UVjet 250 at factory visit, 2007.



Gandinnovations 3348 UV JetSpeed RtR at factory visit, 2008.

ISIJET BlueStreak (Inx/Triangle) Matan Barak (two widths, can be turned into a hybrid) Mimaki UJF-605, the "R" version NUR Expedio 3200 (all now have HP Scitex model numbers) NUR Expedio Inspiration NUR Expedio 5000 NUR Expedio 5000 Revolution VUTEk QS3200r



Anhui Liyu Lyric Eureka 1808UV at FESPA 07

Classifications of UV-Curable printers

ColorSpan 5445UV ColorSpan 5465UV Design DU250-B Flora LJ1800/UVS-Pro GCC StellarJet 183UV Infiniti UV-1606 (USA); 6160P and Xterius 16uvs (Infiniti Europe now Augend). Infiniti America, UV1612S (since ISA 2006). Keundo SupraQ 3300 UV (mid-range, not entry level) Legend 72HUV, update of former DuPont Cromaprint 18uv, at better price than before. Matan Barak; you can add hybrid tables, but this printer is really dedicated roll-to-roll. Neolt is one of few mid-range UV printers that is a hybrid: it has no transport belt. Neolt SuperJet M Oce Arizona 60UV Raster Printers, all models (similar to Flora 1.8 meter machines) Sun (NSK, Russia), modified Infiniti UV, one lamp Sun NEO UV-LED, modified from Chinese prototypes with all LED work done in Russia; this aspect and the ink is not Chinese Teckwin TeckSmart UV1600 and UV2500 (same as B&P Uniform Grenadier UV) Teckwin that does not yet have an official model designation, Xaar OmniDot 760 Triangle Milano (same as new Neolt hybrid) Yaselan Picasso UV Yishan YS2506-DJ

Zund UVjet 250 (has features of a combo, hybrid, and dedicated flatbed)

Combo

Agfa : Anapurna 100 Agfa : Anapurna L and XL Agfa : Anapurna XL2 Agfa : Anapurna M (same as Dilli Titan) ColorSpan 9840uv (HP Scitex FB910) Creation LJ-2508U, a rudimentary Chinese UV combo printer Digirex Technojet Flat UV, rebranded from Yishan **Dilli** (many versions) Durst Rho 160 (no longer current) Durst Rho 205 (no longer current) Durst Rho 600 **Durst Rhopac** Durst Rho 600 Pictor (introduced May 2006 at FESPA) Durst Rho 800 (introduced June 2007, FESPA '07) **Durst Rho 800HS** Durst Rho 900 Durst Rho 1000 DYSS Lasco UV160, UV200 Eastech Scutum Light Eastech Scutum Heavy EFI Rastek H650 EFI Rastek H700 Flora 2200 series, the first version of what became the



Yaselan Picasso UV at FESPA 07



ColorSpan 9840uv at SGIA 07. Now known as HP Scitex FB950.



Durst Rho 1000 combo printer was introduced in early 2009. Here, exhibited at SGIA that same year.

Classifications of UV-Curable printers

DuPont combo printer Flora F1-180UV-BA, Arena 1800UV (in Spain), Raster Printers Davtona H700UV: now EFI Rastek H700 GCC StellarJet 250 UV GCC StellarJET K100UV GCC StellarJET K72UV GO (Graphics One) Fuzion UV, see Eastech; all dropped. **Grapo Octopus** Grapo Octopus II, with Konica instead of Xaar heads L&P Virtu (many models) Mutoh S65uv, rebranded Korean printer ScreenJet 130UV (Korean, do not confuse with Screen from Dainippon Screen, Japan) Screen Truepress Jet2500UV Sun Neo UV LED Evolution, assembled in Russia, modified from earlier Chinese prototypes with all LED work done in Russia; this LED aspect and the ink is not Chinese Sun, smaller lightweight version; tables are too flimsy Spuhl Virtu, many models, to be continued under new owner, WP Digital AG. Vutek PressVu UV 180/600 Vutek PressVu UV 200/600 Vutek PressVu UV 320 Vutek QS2000, QS3200 **VUTEk GS** WP Digital RS25 and RS35 Zund 215-C and 215-Plus Zund 250 (more sophisticated than other combo-like printers; see full report for details)

Dual-structure

Gerber ion^x Fujifilm Acuity (various models) Oce Arizona (various models) NUR Tempo could be considered a rare form of dualstructure.

Unique

Aellora SureFire is a narrow-format label printer, so is not really intended to be classified with large format sizes. Aellora closed shop December 2006.

Agfa :Dotrix is a narrow format web-press that is roll-fed, not a flatbed at all. **Gerber Solara ion**, dedicated flatbed together with

dedicated roll-to-roll, in one unit.

Sun FastJet, page-width array Mimaki SP-3030 (prints on soccer balls)

Cylinder-Drum format UV Printers,

some are Roll to sheet

HP Scitex TJ8500, a Scitex Vision TURBOjet solvent printer retrofitted to handle UV inks



GCC StellarJet 250 UV printer at SGIA 07



Gerber ion Z, a dedicated flatbed with roll-to-roll mechanism. This feature is becoming a trend in other flatbeds like the JFX-1631 from Mimaki, and others.



HP Scitex TJ8500 at ISA 08.

Classifications of UV-Curable printers

HP Scitex TJ8550, not convincingly enough new to warrant a new model designation **Skyair-Ship**, Skyjet cylinder printer

UV printers with page-width arrays (printheads the full width)

Agfa :Dotrix Inca Onset (but not one-pass) Sun FastJet

UV printers attempting to use

cationic UV-curing chemistry

Durst Rho, 350R had an option for using cationic UV ink (a Japanese ink. The results were catastrophic).

Gerber Solara ion

Zund 250, the first version, 2004-2005, ink reportedly from Sericol. The ink was a failure and caused Zund millions of dollars in losses (even though it was the fault of the Sericol ink, not of Zund).

UV printers attempting to use

LED lights for pinning

Dilli Neo Titan (shown occasionally and not yet featured) **Inca Spyder 150**, Only about a dozen of this nice model have been sold.

KonicaMinolta, experimental prototype exhibited at DRUPA 2008.

Luscher, an LED update is available for \$100,000. Reports suggest it is not entirely successful.

Mimaki UJV-160uv, with tables available front and back **Mimaki JFX-1631**, new flatbed that replaces JF-1631.

Raster Printers Daytona T600UV (but no longer trying with LED as of summer '07)

Roland VersaUV LEC-300

Summit, a US company, makes LED modules for UV printers, but not the printers themselves (Meijet in China made the sole model displayed at SGIA in the Summit booth).

Sun Neo UV LED Evolution

Sun Neo UV a smaller version.



Inca Onset S20 at Sericol Fujifilm booth, FESPA '09.



Konica Minolta KMIJ-X; prototype that uses LED lamps and cationic ink, introduced at DRUPA 08.



Raster Printers Daytona T600UV at SGIA 07

Conclusions: first on hybrid printers

I know two hybrid printers that have two parallel sets of pinch rollers atop grit rollers: the Swiss-made Zund 250 and the Chinese made Teckwin TeckSmart. There are advantages and disadvantages in the dual parallel mechanism: advantages are better grip and easier to run backwards, which is useful when printing white or doing multiple-strike printing to create Braille effect. Downside is added cost and complexity, and sometimes it is a challenge to align or coordinate the thick board when it is between the two sets of drive rollers.

Switching a solvent printer to make a hybrid printer usually works, but you must be sure that your material feeding s ystem can grip a thick board early in the feeding/printing system. When Keundo adapted their nice solvent printer, they found out that a board could not be gripped and held until it was past the printing zone. This is one of several reasons why this hybrid UV printer has not been seen much in the last two years.

Surprisingly Mutoh is attempting to launch a hybrid style printer in the high price range, where most of the competition is all combo or dedicated flatbeds.

Zund has decades of experience making dedicated flatbed cutters. Zund then accumulated five years experience with the Perfecta Print prototypes from Mechatron that became the best-selling Zund 215. This experience taught them that you needed something more than a combo system if you intend to move a diverse range of materials. So the Zund 250 has a unique double-roller system: two complete sets of pinch-over-drive-rollers. One set is before the platen, the other set is immediately alongside the back of the platen (where other hybrids have their only set of pinch-over-grit-rollers). By designing a double set the Zund 250 strives to overcome any downside of a simple one-set hybrid and simultaneously to overcome the skew problems inherent in a combo system.

Zund managers explained the situation quite clearly, "After experience with conveyor belts for many years and with over 400 examples, we realized that transport belts simply are inadequate for handling the diverse range of materials that end-users need to run through their printers."

But it is worthwhile noting that no other high-end printer manufacturer has followed the experience of Zund. Indeed combo-style printers are even more popular today than in 2004 when the Zund 250 was first introduced at DRUPA '04.

Plus, the Zund 250 is unique in offering a dedicated flatbed table that can be moved on top of the hybrid system, totally overlaying it.

General Comments:

Considering how many big-names such as Mutoh and Seiko did not yet get their UV printers to function fully, the functionality of the GCC and all Korean UV printers is all the more remarkable. Yes, the Mutoh Zephyr is now being exhibited, but it took years to finish. Rumor has it that Mutoh had to sub-contract much of the technology and/or hire an outside company to move this project forward.

Again, all the more impressive that a tiny company such as IP&I has UV printers that already last year I heard many people say "the IP&I Cube is one of the best designed UV printers available in the mid-range."

DJT and PIT failed totally to get their printers out the door. All three HP Scitex printers failed (all the successors to the venerable VEEjet, and also the XL2200). And so far, no Chinese manufacturer, on their own, has created a UV-printer that adequately functions, though Teckwin is closest with one of their models, their flatbed TeckStorm. Flora got their UV to function after DuPont, Raster Printers and now DEC and LexJet invested millions of dollars and showed the original manufacturer how to redesign and rebuild the machine step by step.

Hypernics went bankrupt and first Luscher's and then L&P's UV printer division did not survive. Scitex Vision will survive just fine (with tons of money from HP), but neither has not yet been able to develop their own UV-printer technology. Gandinnovations has outpaced them for three years in a row.

The Infiniti is under \$40K but is not yet a fully finished machine. So for entry level, there is still only one popular model that has passed the test of time: the DisplayMaker 72uvR and its update, the 72uvX. Of course in 2008 and even more so in 2009 both these venerable ColorSpan models are obsolete when compared to what is available from Korean and Taiwan.

The three early market leaders in dedicated flatbed printers were Sias, Inca Digital, Gandinnovations, and NUR: all at the high-end. Today, in 2009, the market leaders are at entry level (Gerber Solara ion) and mid-range: EFI Rastek T660 and T1000, and Oce Arizona 250.

Lessons to Learn

Sometimes a simple printer works best. ColorSpan became the #1 world best-selling UV printer through simplicity. People who have a 72uvR or 72uvX tell us they liked it very much. It's by no means perfect, but sign shop after sign shop report in detail how much money they have made with the ColorSpan and indicate that it works two-shifts a day and sometimes all night too.

In very rare instances a unique and complex printer works: the L&P Virtu is an unusual example of, if you have tons of money, you can make even innovative technology work. Unfortunately they did not have a sales or marketing concept that could compete with Durst, and L&P withered and then was replaced by Spuhl and WP Digital AG which bought Spuhl's printer division.

The complex and unique Agfa :Anapurna 100/Mutoh Cobra 100 was so complicated and innovative that it does not yet work. They had to replace this printer with a rebadged conventional combo model from Korea. It took three years for Agfa to redesign and improve their year 2005 prototype (now available as the Anapurna XLS).

Trying to produce a UV-printer at under \$60,000 has so far failed. The Oce Arizona 60UV failed. The original Raster Printers failed until they raised the price and improved the innards. By the time you pay the actual invoice it is over \$60,000 and it has not yet garnered the accolades as has the ColorSpan. The ColorSpan 5440 also failed because it was simply too low-price to have parts strong enough to do a good job.

So far the printer manufacturers who have been relatively consistently adept in both engineering and manufacturing are Dilli and IP&I: both in Korea. I have not visited the DYSS factory which means no opportunity has been available for me to test their printers, so I can't comment on their products in depth.

The printers to watch in 2009 are the Gerber ion and Mimaki hybrid with LED lighting. I have inspected a Gerber ion in a Chicago screen printing company and the owners (and their clients) are content. The Mimaki hybrid still has curing issues with its LED lamps, but this Mimaki and the Gerber ion have the potential to take over the #1 best-seller title for entry-level printers (held first by Zund, then by ColorSpan 72uv series, then by Oce 250).

The trade shows to watch in 2009 will be ISA '09, then FESPA Digital in May and SGIA in the autumn. Then there are a series of trade shows throughout Europe. FLAAR will be at almost all of them, even flying back and forth when two major shows are on two continents simultaneously (such as Photokina '06 in Cologne and SGIA '06 in Las Vegas the same week). We did this with Graphics of the Americas in Miami and the Middle East Sign show in Dubai.

Our goal is to learn as much as is possible and report the findings and trends to our readers.

Most recently updated March 2010.

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Classifications of UV-Curable printers

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.

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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).

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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.

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Classifications of UV-Curable printers

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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 waterbased 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

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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

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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 jerryrig 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.

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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 19 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;

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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 endusers 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, EskoArtwork, Raster Printers (EFI Rastek), DEC LexJet, DigiFab, Barbieri electronic, Seiko II, 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, especially when FLAAR staff need to be on the road over a quarter of a million miles per year (roughly over 400,000 km per year total for the staff). Obviously this travel is hosted since unless money falls from heaven there most realistic way to obtain funding to get to the demo rooms for training is direct from the source.

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, EskoArtwork, Gerber, Grapo, IP&I, Mimaki USA, Mutoh, Dilli, GCC, NUR, Oce, Shiraz (RIP), Sky AirShip, 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 roughly every two years. 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 access to their digital equipment, also 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 Tech-

nologies, 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.

Classifications of UV-Curable printers

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 (2008-2010)

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

Introduction to UV Curable Inkjet Flatbed Printers



Most recent UV Printers



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



UV Printers Manufactured in China, Korea and Taiwan

