



Our Experiences with ColorSpan printers



ColorSpan Mach 12 exhibited at Photokina trade show 2002.



Visit to MacDermid ColorSpan August 12-14, 2002

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As part of our receipt of the ColorSpan Mach 12 in June, we were qualified to receive three free days training on the operation of the Mach 12. Jeff Ohlmann, who installed the Mach 12, did an excellent job of training James Senkar and me on the operation of the printer in June. However, the opportunity to visit the company in Minneapolis and have additional hands on training was a bonus.

Attending the training with me was Charles Spontelli, a faculty member in VCT at BGSU and an expert on color management, and Milos Krsmanovic, a doctoral candidate in the College of Technology. His primary research this summer has been on RIPs. Each of us hoped to gain more knowledge on the printer as well as a better understanding of the technology behind inkjet printing.

An additional half day of training was provided beyond the normal operator training for us to explore more specific issues with the color management and also for me to be trained on repairing a problem with our Series XII printer. We were able to tour the manufacturing facility of Colorspan as well. Also attending the sessions were two retailers from New Orleans, a gentleman from Las Vegas interested in purchasing the printer, and a quality control inspector from the factory.

The first day began in ColorSpan's training offices. In the past few months Colorspan has been consolidating its building space from three buildings to two. The training facility had only been in its current location for three or four months. The room contained the Mach 12 and four other models of printers. This same office is used for service training. While rather unimpressive with a lack of sample prints on the walls, the room was of adequate size and contained all the hardware necessary for the training. We received a new operator training manual at the first of the class.

Justin was in charge of the sessions. We began with the basics of loading the print heads and inks on the printer and maintenance. We reviewed the ink system and the possible combinations for the printer. This printer was configured for the newly released 12 color ink set. This set includes blue, orange, red and green to the normal eight color set. These colors are to help reproduce some of the most difficult colors that are normally out of the gamut of six or eight color printers.

We did a hands-on session of replacing print heads, ink cartridges and ink tubing. This included the process of bleeding air out of the lines and print heads. We ran Autosets and Justin explained what each portion of the calibration meant. He also demonstrated how to run the calibration manually. In this case we each had the opportunity to judge the results of the test and enter the information into the control panel.



One of the primary focuses the first day was on maintaining the printer. Regular cleaning of the service tray and print heads will keep printing problems from occurring. Printing prime bars was the primary method to judging the output of the print heads. With the new ability to tilt the print head assembly up for cleaning this daily maintenance can be completed in 15 or 20 minutes.

Media loading was demonstrated and performed by all. The new dual direction media feed switch on the back of the printer makes media loading a breeze. A gentle tug back on the roll of media will also smooth the media and square the paper in the printer grit rollers. Justin emphasized running media feed calibrations after each media change or pass mode change to ensure no banding will occur.

In the afternoon we went through the menu options and settings of the printer. This included information on the Attention messages, user diagnostics and service tests. Discussions included the best settings for the printer in particular applications.

The second day of training dealt primarily with the ColorSpan RIP, the Colormark print server. This is a RIP plus color calibrator package which prepares and sends jobs to the printer. While outside RIPs can be used with the printer, all Colorspan's efforts are toward making the print server work optimally with the printer.

One of the advantages of the server is its ability to accept jobs from both Macs and PC's. Part of the training went over setting up these ports and configuring them for the best printing. These ports can be routed to various queues before and after the RIPping process.

There were some settings I considered important to the best quality printing.

1. In the port settings rich black should be used instead of pure black. A better gradated shadow area will be reproduced.
2. Set the default print mode to manual so you will be able to adjust the image size and cropping before it is sent to the RIP.
3. Use the Colormark CMS for the best photographic color reproduction. If you are more concerned with solid colors check Canonical. Also select Colormark RGB.
4. Use Trumatch for best CMYK color reproduction.



We also covered loading the printer utilities for both the Mac and PC. We learned about the Downloader program for sending images as well as sending files through applications such as Photoshop.

The afternoon of the second day was spent printing and learning more on the capabilities of the 12 color ink set of the Mach 12. In our test printing and in discussions with Justin we learned a few key notes about its color capabilities. One of the main facts I learned was concerning use of medium and light cyan and magenta in printing.

The use of additional tints of ink has given two advantages to the printers. The gamut of each color is increased by using actual dots of lighter ink to represent lighter colors instead of relying on the spacing of darker dots with the white space in between to give the appearance of that lighter color. The lightest tints can be reproduced more accurately.

The other advantage is in resolution. In general, thermal print heads like those used in the Colorspan can only print the same size dot. When using a single ink the space between the dots must be increased to reproduce lighter tints. This leads to areas that look grainy due to lower dots per inch in those areas. When secondary tint inks are used the dots from both inks are overlapped and interspersed to reproduce the tint. The dot density increases and apparent resolution does as well. So, with the use of medium and light cyan and magenta gamut as well as resolution increases

The Colorspan print server performs these calculations of what combination of ink are needed to reproduce all colors. It breaks the image down into each ink layer and sends the information to the printer. The additional BORG color inks add some colors that were difficult if not impossible to reproduce with the standard 8 ink set. These inks will last a long while since they are only used for very specific colors.

The Colorspan print server has one difficulty in color reproduction. It can't resist mixing a little bit of other color inks along with the primary ink needed. For example, if you needed just a pure cyan process color, the software would include a small amount of other colors to make the color it believes is

correct. This can show up as slightly muddy saturated colors. Using Canonical in the port settings will help in saturated tone production.

We printed some test images to demonstrate how the additional inks help in color reproduction. Again, the difference between 8 and 12 color was not huge unless you had a specific saturated blue, orange, red or green color.

Another set of print tests we performed were for the effect the number of passes of the print heads made on print quality. We ran an image through the printer at 1, 2, 4, 8 and 12 passes. A huge improvement in quality could be seen between 1 and 2 passes. 4 pass improved it even more. At 8 pass the difference was less noticeable, and 12 pass was barely different than 8. The difference in quality comes from how the printer is able to reposition dots in passes for a layering of dots with an increase in the apparent resolution. We found that 4 pass would work fine for most non-photographic work and 8 pass did well with photographs. If speed is important, less passes means faster printing.

Color Management and the Colormark + program for profiling were not covered specifically in the training. However, we did go through the basic calibration of the printer for the media and ink combination we were using. We used the on board camera for the linearization of the printer. The Colorspan is geared toward its own internal calibration system, although it will support ICC profiles in a limited way. It is much easier and more accurate to use the calibration systems of the print server than using an ICC workflow.

Our last day included a discussion and tour guided by Jeff Ohlmann, senior technical services specialist. We discussed some points of the color management system including how the software converts files into LAB color to keep the maximum gamut of the image and how the image is separated to go through the printing process.

I was very impressed in the manufacturing and service facilities. Colorspan supports all their printers back through the early 90's and maintains a large part inventory. All the Mach 12 and Series XII printers are manufactured by hand here. The quality of the engineering from the parts of the printer to the shipping case show excellent workmanship.

The service and support areas have printers available to help work through problems with customers on the phone. As part of my training Jeff walked me through changing bearings on the grit roller assembly by taking a printer apart and putting it back together again.

I believe we came away from our visit to Colorspan with a new understanding of the workings of the Mach 12 as well as a deeper appreciation of what it takes to manufacture the printer. I also came away with a better understanding of how apparent resolution is derived. The visit to Minneapolis was an excellent investment in our time.



ColorSpan Display Maker XII Training

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ColorSpan Display Maker Mach XII Training By Charles Spontelli

Recently, I had the opportunity to attend ColorSpan's training program on the DisplayMaker Mach XII™ large format inkjet and printer. The training consisted of a two-day program with lunch provided. The first day of the program covered the printer hardware. The morning was spent discussing the printer's numerous setup and maintenance topics. We spent the afternoon with hands-on practice on printer. Day two was spent in training on the Color Mark™ RIP, which is sold with the printer. The morning of day two was spent with RIP set up and configuration concepts. The afternoon was again hands-on with the RIP, creating various work flows and running color calibrations on the Mach XII printer.

The printer that we worked with was ColorSpan's newest Mach XII. This printer has 12 print heads. The 12 heads provide for faster printing speeds (the company says up to 400 ft/hr.) or a variety of possible ink combinations. Color Span has two different ink sets available, EnduraChrome (dye) and PermaChrome (pigment). The printer we were working with had the newly released 12-color EnduraChrome wide-gamut ink set. This set consists of Cyan, med. Cyan, Lt. Cyan, Magenta, Med. Magenta, Lt. Mag., Yellow, Black, Red, Green, Blue, and Orange. With the 8-Color dye set, or the 6-color pigment set color, or the 12-color set, the training manual diagrams 12 possible ink configurations. A particularly handy configuration is the 6-color dye and 6-color pigmented combination. This allows switching from dye ink to pigment without changing anything on the printer!

Our hands-on training included everything about starting up a printer from scratch (installing inks, ink feed lines, and print heads). We also performed all of the basic calibrations and daily maintenance procedures. ColorSpan provided a nicely illustrated notebook which described all of these procedures, as a reference. Depending on your speed setting and ink configuration the printer will print from 600dpi to an "apparent" 1800 dpi. The image quality is quite good and comparable to any of its mainstream competitors. Increasing the number of "passes a print head makes over the image determines an image's smoothness. We tested 2, 4, 8, and 12-pass mode. I found that "4-pass" mode adequate for most work, while "8-pass" mode would be required for high-end photographic work.

Significant Unique Factors

The Color Span Mach XII had three unique features that I feel are worth pointing out. The tilt-up print head carriage, the 12 print heads, and the touch screen interface are all features that stood out. The tilt-up print head carriage was my favorite and a HUGE benefit. The carriage carrying all 12 print heads is easily unlatched and swung into position exposing the bottom (nozzles) of the print heads. The print heads can be easily cleaned with a damp wipe. The company recommends this as daily start-up maintenance for clog-free operation. The access is so easy that cleaning a clogged head takes only a minute.

The 12 print head design is also a significant innovation of this machine. This feature has implications for productivity as well as flexibility. For higher productivity, the Mach XII can be configured with two identical sets of six-color inks. This doubles the machine output. There are no fewer than 12 examples of various ways configuring the inks in the mach XII training manual. One useful configuration is with two six-color ink sets, one in pigment (PermaChrome) and one in dye (EnduraChrome). Another possibility shows an 8-color dye set with a 4-color pigment set. Our training machine had the newly released 12-color wide gamut ink set. I will discuss printing with this configuration later in this article.

Another feature I liked on the Mach XII is one that the company doesn't speak of in their literature. The Mach XII has a BIG touch-screen interface for operator control of the printer. I found the hierarchy in the menus to be very logical and intuitive. Not only was the printer very easy to control from the touch screen panel, but also some of the controls are very innovative. The onboard CCD image sensor can be tested from the panel. This sensor can be used to measure color data that provides a basis for creating profiles of various new media and ink combinations.

The only thing I didn't like about the mechanics of the printer was the media loading mechanism. You have to get behind the printer to load a new roll of media. This was awkward and would require leaving more space around the machine for rear access.

ColorMark™ RIP and Print Server

The DisplayMaker Mach XII™ in our training program was driven by a ColorMark™ postscript RIP server. The ColorMark™ is a dedicated RIP running on a Windows 2000 or XP operating system. Like any good server, it accepts data across a network in all the popular protocols from AppleTalk to TCP/IP.

The visual interface design for configuring workflows is especially nice and easy to use. The interface looks like a flow diagram or a road map. It's set up with icons for various items arranged in order of Input, Process, and Output. The workflow is identified by a simple line that connects one icon to the next. Anyone can easily see the workflow by just following the line. The RIP saves multiple workflow configurations.

The ColorMark™ RIP has all of the features you'd expect of any high-end RIP. Calibration and linearization of the printer from the RIP worked well. The RIP has one feature that I've yet to see on any other Raster Image Processor. The ColorMark™ has the ability to create color management profiles. In concert with two light sensors onboard the Mach XII printer, the RIP collects density and colorimetric data from printed targets on the printer. The data is used to create output color management profiles. The profiles can be saved as ICC compliant or proprietary ColorMark profiles. Using the proprietary formats is a much cleaner and easier workflow on this RIP. The ICC profile workflow seems like an afterthought.

With so many ink and media combinations available on the Mach XII, you would want to have a new profile for each new ink, media, and printing configuration (2-pass, 4-pass etc.). A good scanning spectrophotometer and color profiling software for creating output profiles can cost from \$3000 to \$5000. Their functionality is already built-in to the Mach XII with the ColorMark™ RIP. This is quite a value

12-Color Wide-Gamut Printing



The ColorMark RIP separates the colors in the image files into the various ink colors available on the printer. The printer we worked with in training had the newly released 12-color ink set. I was very interested to see the performance of this ink set. Unfortunately, since the inks were just recently installed on the printer, our trainer didn't have a lot of experience with wide-gamut inks. Also the photo images that we printed, although very beautiful, did not have many of the highly saturated blues, oranges, or reds that would benefit from the added red, green, blue, orange, and green inks.

Photos that we printed with the 8-color set did not look dramatically different than the 12-color. Again, we may have seen a more significant difference if the pictures contained more highly saturated colors. Ours did not. Also, the 8-color EnduraChrome gamut was large in its own right. So, comparing it to the wide-gamut inks using photos with average color saturation was less than exciting.

We were shown printed samples of vector art logos which did have highly saturated reds, greens, and blues. They were printed with 8 and 12 colors. The comparison here was striking! The saturated colors on the 12-color print were dramatically brighter and cleaner than the 8-color set. The wide gamut ink set was a significant improvement for this kind of work.

Conclusions

The ColorSpan™ training was an excellent opportunity to try things on the Mach XII printer without the interruptions of the day-to-day business and production demands. Not only was our instructor Justin knowledgeable, he was very forthcoming answering any questions. Questions were answered honestly even if they involved the competition. The training was thorough with plenty of hands-on. The printed training manual was an excellent reference and a good refresher when I got back home. The two days spent at ColorSpan were well worth it and will pay dividends for years to come.

The equipment is very productive with excellent image quality. The twelve ink design provides for broad flexibility to accomplish a variety of work. The ColorMark™ RIP's ability to create color management profiles for new media and printing configurations is unique. This is a professional level system for the digital printing industry.



***What it's like to print on a
ColorSpan Mach 12
when you have never used this printer before?***

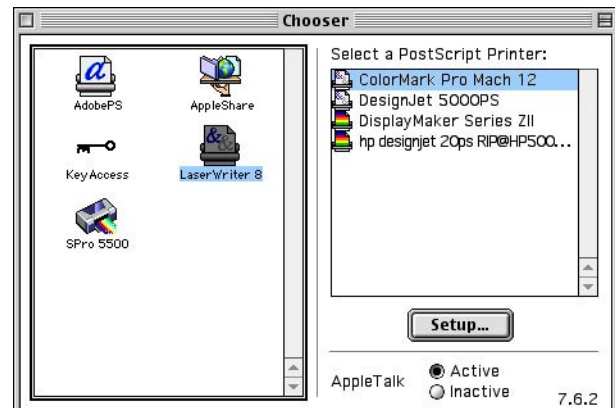
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ColorSpan Visit By Jean MacDonald

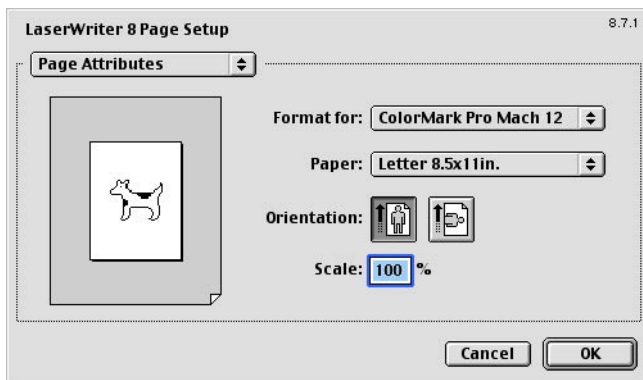
My goal was to create an acceptable print using the DisplayMaker Mach 12 printer from a saved file. I have had no prior experience with wide format printers and I was attempting to learn using printer manual alone.

I felt that the ColorSpan Printing Tools User Guide was very well written in a clear and concise manner with an adequate number of illustrations to give clear instructions. The guide begins by helping the user to select a printer. Nine clear steps are listed beginning with selecting the Chooser from the Apple menu. The remaining steps include selecting the AppleTalk Active button and selecting the LaserWriter8 print driver necessary to use the DisplayMaker Mach 12. At this point the user is directed to choose an AppleTalk zone and choose a printer.

I began by accessing a picture file and bringing it into Photoshop. I used the Photoshop print dialog box to prepare the file to send to the printer. After checking the output size and resolution of the file to make sure they were acceptable, I opened the Photoshop Page setup dialog box. At this point I was working strictly from the user manual instructions. An overview of the basic steps was listed at the beginning of each section giving me an idea of what to expect in the following information. The overview steps were bulleted and the detailed steps were numbered, making it easy to follow in sequence. For instance, the user is directed to select Page Setup from the application File menu and complete the following steps.



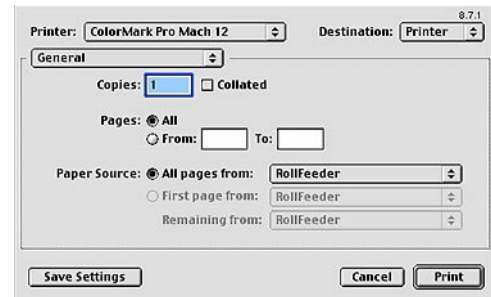
The Page Setup dialog box was easy to follow to choose the size of the page, paper, orientation, and scale. The paper size options were listed in a drop down menu and the orientation choice was made through a simple icon. A scale text box allowed the user to enlarge or reduce from 25% to 400% of the original size. Selecting the Picture icon in the dialog box lists paper size and margin information.



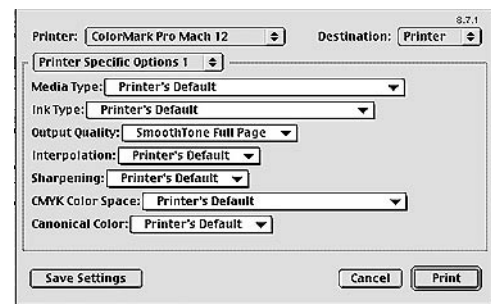
The user is then directed to choose Print from the Application's File menu. In the Print dialog box, the general options to select the number of copies, paper source (RollFeeder is the default that the user is directed to select.). There is an option to select File as the destination rather than Printer. The Guide gives a concise explanation of the option in terms of selecting File to create a PostScript file of the document to save to the hard disk. I then chose Print from the Photoshop File menu. The printer was not listed in the printer cue, however the user manual covered the process of setting up the printer in the first section. I reread that section and changed the printer driver and printer from the Chooser dialog box. I returned to the Photoshop Print Dialog box and chose the correct printer now listed in the cue. Leaving the settings at the default choices, I selected Print.

The manual describes a second method for sending files to the printer that bypasses Photoshop. Assuming that no adjustment must be done to the print, you can drag and drop the icon of the file on to the Downloader Utility icon. When selecting files from the hard drive or desktop, first select download from the File menu. A list of available files appears from which you can select the desired file by clicking Open. If you access your image file in this manner, you must choose the print specifications at the printer server. These choices include output size, number of copies, paper or conserve paper, position of image on the paper, and rotation.

Now the file had moved to the computer that services the printer. Since I had set the specifications in Photoshop before I sent the file, the image had gone through the RIP software and was ready to print. The screen showed the path of the file as a green line through the steps and through the rip icon to the print queue. The screen was very intuitive and easy to understand. As the file did not begin to print, I checked the small screen on the printer itself and pressed the online toggle. At that point the file began to print.



I think the printer manual was very well written and I had very few problems printing. I was unsure of some practical matters such as rewinding the media and lining up the paper to begin printing. The paper was looped on the roller prior to printing and I manually tightened the slack. I did not see instructions to do this in the Guide, however it seemed to be a practical precaution. The screen on the printer indicated very clearly how to advance and rewind the media and the process was also discussed in the guide.

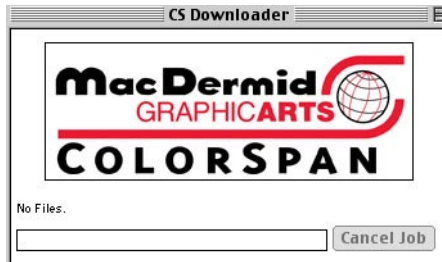


The file is saved or spooled at the print server computer for later processing.

The import queue has three categories, Priority, Standard, and Hold listed graphically on the System Control Interface screen. The Priority queue is to hold files that you want to send to the rip software immediately. The Standard Queue holds files with regular priority and is the default setting. The Hold Queue is available to hold files until they are prioritized at a later time. There is an option to send a file directly to the RIP. It bypasses the spooler and goes directly to the Rip and then to the Output queue. You may move files between the Standard and Priority queues by dragging the file.

At the RIP process the files are converted automatically to a language that is compatible with the printer translating them into images for printing. After the Raster Image Processing (RIP) is complete, the file is sent to an Output queue where it can be saved for another printing at a later time, be deleted, be previewed, and change the print settings. From the Output queue, the file is sent to the printer.

Another touch-screen control panel is located on the printer itself. Its purpose is to allow interaction with the printer when changing ink and media, respond to error messages, and to change configurations. The Ready screen appears when you toggle the Online-Offline button. The top level of the printer's menu is called the Front Page and contains icons for advancing the media, Status and Attention, among others. The Status icon presents the status of the options that are set by the user. The Attention icon represents a warning condition and allows you to read the error condition in order to make corrections.



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

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Inclusion in this study by itself in no way endorses any printer. Equally, exclusion from this study in no way is intended to discredit any printer. The same is true for the RIP, ink and media choices.

Advisory

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

The sources and resources we 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 two FLAAR facilities at the two universities. 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 tradeshow, 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.

Equally often, what at first might be blamed on a bad product, usually 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.

But we 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. As a result, products are described "as is" and without warranties as to performance or merchantability, or of fitness for a particular purpose. Any such statements in our reports or on our web sites or in discussions do not constitute warranties and shall not be relied on by the buyer in deciding whether to purchase and/or use products we discuss because of the diversity of conditions, materials and/or equipment under which these products may be used. Thus please recognize that no warranty of fitness or profitability for a particular purpose is offered.

The user is advised to test products thoroughly before relying on them. We do not have any special means of analyzing chemical contents or flammability of inks, media, or laminates, nor how these need to be controlled by local laws in your community. There may well be hazardous chemicals, or outgassing that we are not aware of. Be aware that some inks have severe health hazards associated with them. Some are hazardous to breathe; others are hazardous if you get them on your skin. And 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 tradeshow, during visiting a print shop, or having been informed about a product via e-mail or other communication. Tradeshow are idealized situations, with full-time tech support to keep things running. The same equipment may not work as well in your facility as we, or you, see it at a tradeshow. 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.

Heat, humidity, 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 our two universities.

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

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

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

Be aware that some RIPs can only accept ICC color profiles: you quickly find out the hard way that you can't tweak these profiles nor generate new ones. So be sure to get a RIP which can handle all aspects of color management. Many RIPs come in different levels. You may buy one level and be disappointed that the RIP won't do everything. That's because those features you may be lacking are available only in the next level higher of that RIP, often at considerable extra cost. Same thing in the progression of Chevy through Pontiac to Cadillac, or the new Suburbans. A Chevy Suburban simply does not have all the bells and whistles of the Cadillac Escalade version of this SUV.

Don't blame us... besides, that's why we are warning you. This is why we have a Survey Form, so we can learn when you find products that are inadequate.

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.

In some cases a product may work better on a Macintosh than on a PC. 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.

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.

Another option is to bring your images on a CD disk to the FLAAR facility at BGSU. Here you can test your images on an Iris 3047 giclee printer (Ixia version), Mimaki JV4 (with textile inks for silk), either of two ColorSpan printers (DisplayMaker XII, Mach 12, HP 5000 (essentially same quality as the HP 5500 which is primarily faster). We also have a Canon W7250, Epson 5500, Epson 7600, HP 120nr and the HP 20ps. If you are curious to see your images on a color laser, we have 13 x 19inch color output available on a QMS-Minolta 6110. Such a visit is treated as a consultation which implies a 1-day minimum consulting fee plus the ink and media used.

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. For example there are three Mimaki printers we would love to have (their flatbed, their newest textile printer, their new UV-curable ink printer)

We would definitely like to have a Gradco Mammoth (flatbed up to 3 inches). Would like to evaluate an Encad NovaJet 880 to print on thick material (up to half an inch if I remember correctly).

When Roland finally comes out with an 8 color version of Epson's 10000 printhead generation which offers 32 passes, wider than Epson's 44 inch limit and no banding whatsoever (if that is possible) that would be the ultimate fine art giclee printing factory. But since that printer does not yet exist, the art students on our campus use our HP DesignJet 5000ps, newly arrived HP 5500ps, Canon W8200, and ColorSpan Mach 12. The art department does museum exhibits and wins awards with the output.

We are also interested in the Western Graphtec cutter-printer with eight heads (that was producing outstanding quality output at the SGIA '03 tradeshow).

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 tradeshow...but don't use 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.

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.

Acknowledgements

Fortunately the two universities cover most of the operating costs of FLAAR on their campus. Thus we do not really have much incentive to pocket hush money from producers of lousy products nor special funding from companies who make the better products. 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 is fairly evident rather quickly.

With 20 employees the funding has to come from somewhere, so although the universities cover the core expenses, we do welcome sponsorship, grants, and project-oriented funding from manufacturers. 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 function as advertised and which don't. We saw one hyped printer grind to a halt, malfunction, or otherwise publicly display its incapacities at several tradeshow in a row. At each of those same tradeshow another brand had over 30 of their printers in booths in virtually every hall, each one producing museum quality exhibits. Not our fault when we report what we see over and over and over again. One of our readers wrote us recently, "Nicholas, last month you recommended the as one of several possible printers for our needs; we bought this. It was the best capital expenditure we have made in the last several years. Just wanted to tell you how much we appreciate your evaluations...."

We thank ColorSpan, Hewlett-Packard, Parrot Digigraphic, Canon, Scarab Graphics, ITNH, and Color DNA for providing funding for technology training for the FLAAR staff and our colleagues at Bowling Green State University and Universidad Francisco Marroquin. Grant, sponsorship, 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 to the two universities where FLAAR does research on wide format digital imaging. We thank Epson America for providing a printer to our facilities at Francisco Marroquin University and Parrot Digigraphic for providing two different models of Epson inkjet printers to our facilities at BGSU. We thank Mimaki USA for providing a JV4 and then a Mimaki TX-1600s textile printer and Improved Technologies (ITNH) providing their Ixia model of the Iris 3047 giclee printer.

We thank 3P Inkjet Textiles and HP for providing inkjet textiles so we could learn about the different results on the various textiles. IJ Technologies, 3P Inkjet Textiles, ColorSpan, Encad, HP, Nan Ya Pepa, Oracal, Tara and other companies have provided inkjet media so we can try it out and see how it works (or not as the case may be; several inkjet media failed miserably, one from Taiwan, the other evidently from Germany!). We thank Aurelon, ColorGate, ColorSpan, ErgoSoft, HP, PerfectProof, PosterJet, Onyx, Ilford, 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 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 and Francisco Marroquin University. These personnel are not hired by any inkjet printer company; they are universities employees (as is 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 Hewlett-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.

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, 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 primary 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 two brands: 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.

Grant funding, 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 two manufacturers of piezo printers (Epson and Mimaki). This is because piezo has definite advantage for some applications; thermal printheads have advantages in different applications. Our reviews have universal appeal precisely because we feature all competing printhead technologies. Every printer, RIPs, inks, or media we have reviewed have good points in addition to weaknesses. Both X-Rite and competitor GretagMacbeth provided spectrophotometers. Again, when all sides assist this program there is no incentive to favor one by trashing the other. Printer manufacturer ad campaigns are their own worst enemy. If a printer did not make false and misleading claims, then we would have nothing to fill our reviews with refuting the utter nonsense that is foisted on the buying public.

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

We turn down offers of funding every month. 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.

Grants, sponsorships, and funding for 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 tradeshow 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 tradeshow. 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 ought to have access to competing information. Competition is the cornerstone of American individualism and technological advancement.

FLAAR also covers it's costs of maintaining the immense system of 12 web sites in three languages and its two university 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. 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.

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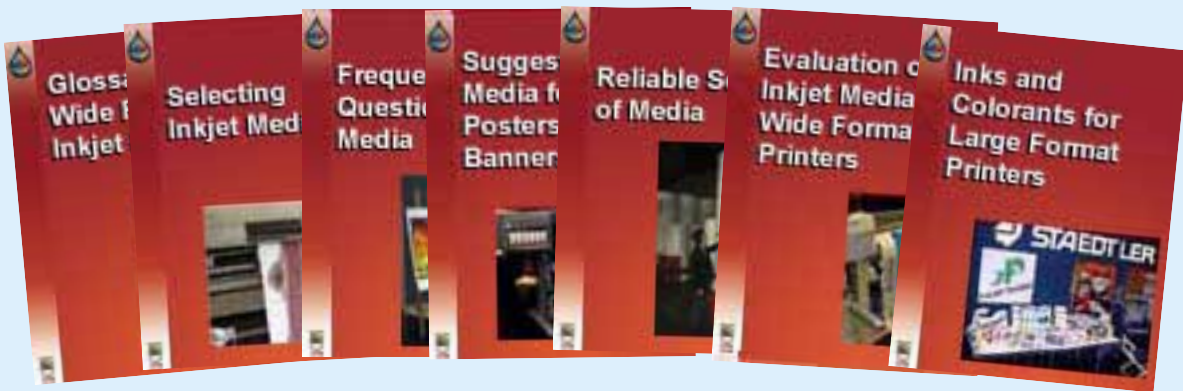
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