How to Select Your Next Wide Format Printer, Part II

Print Technologies

It's kind of interesting how the second part of this article even came about, and I'd like to take a moment to share with you. Anyone who has done any writing can appreciate the fact that sometimes a piece may not turn out as initially intended. That was certainly the case here. When asked to write an article for an upcoming issue, I suggested "How to Select Your Next Wide Format Printer." The initial, seemingly obvious approach to the topic was technology, though as I got into the creative process, the article turned out to be 10 percent technology and 90 percent knowing your business and selecting the right partner for this important investment. After submitting the article, I was soon asked to write another, this time with a heavier focus on the technology.

To briefly review why the article went the way it did in the first place, I have been a part of the specialty imaging industry for over 25 years, and have seen wide-format color from its infancy. In the old days, we operated from a brick-and-mortar dealership. Potential customers came in for traditional demos that often lasted for hours. We were able to go into great depth, explaining the technology, applications, materials and processes — even though nobody knew what we were talking about at the time. Training was intensive, usually a minimum of two, but more often three days on-site, teaching the entire process. It happened this way all over, early innovators paying dearly for what was skinny, leading-edge technology that didn't always work. Brave customers were typically clustered around the various demo centers, and were almost always in or near a major city.

My, how things have changed! Important demographic changes in the industry include the distribution of printers over a wide geographic area, gaining one's education via the Internet instead of hands-on, and the commoditization of the industry itself. In my case, I have migrated from the brick-and-mortar dealership described above to the service side of the industry. This fairly short article cannot even begin to detail the horror stories heard almost daily from our service customers:

- My dealer never showed or told me that.
- The only training I received was how to load material and ink.
- I never knew I had to do any maintenance.
- I didn't know it couldn't print on that material.
- I thought all materials printed the same.
- If I knew then what I know now I wouldn't have bought this printer.
- You mean I have to pay for service?
- I never knew the service was so expensive!

So what does all this mean for you? It bodes well that you are reading this article and making a good attempt to be educated on what you need to do in order to make an informed decision on your next printer purchase. Before delving into the technology discussion promised, let's take a quick review of Part One, just in case you missed it. There are a few things you need to do before you even go and look for printer:

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- Know your business, and why and for what reason you are looking to purchase a printer — based on what you need to produce with it.
- Know your business, financials and business cycle well enough to know what you can tolerate financially.
- Choose a good vendor partner as this is a journey in technology — not just in the printer, but also in all of the associated technologies — inks, materials, RIP software and service.

When it comes to choosing a partner to walk this journey with, your rep should:

- Ask about your business — your products, customers, business cycle and your financial wherewithal.
- Make him- or herself valuable to you by offering good information and helping you make an informed decision on your purchase.
- Provide detailed information to you about their experience or their customers' experience on any products they recommend.
- Be willing to offer references on these products.
- Be honest.

I cannot emphasize enough how important all of this is when it comes to making a decision that will likely impact you financially for years, either positively or negatively.

Okay, enough, now let's get on to the technology. As we have customers and vendor partners from all segments of the industry, I apologize but I cannot be vendor-specific. I feel the need to say as well that though most of this information is factual, there may be some opinion laced within. Though the technology has gotten far better and more reliable, there are enough significant differences that it pays to know ahead of time what you are getting.

The first and easiest way to categorize printers is by the ink technology. The names for the inks either indicate the carrier for the coloration (dyes or pigments) and/or the means of curing the inks.

Aqueous (water-based)

Aqueous (water-based) inks use water as a carrier, dyes or pigments for colorants, and are generally used for direct-to-substrate printing (paper, vinyl, banner, canvas). This group also includes dye sublimation (transfer to secondary material) and direct-to-fabric products, which have special curing requirements.

Size Range (Width): Desktop to super-wide (five-meter). The larger printers in this category are generally converted or dye-sub purposed solvent machines used for dye sublimation applications. Common commercial sized units usually max out around 60 inches.

Common Applications: Fine art and photo, indoor and promotional printing, corporate and institutional, engineering, CAD, GIS and mapping.

Pros: Extreme quality via very high DPI or high number of colors; very mature technology; fine gradations for art and photography with multiple shades of black; comparatively low cost of entry; Windows or Mac printer driver with smaller units 60 inches and below; good to very-high speed depending on printer and application; production of superior backlit prints with some ink technologies; no volatile emissions, allowing indoor use; generally lower maintenance and easy to use; small shop footprint.

Cons: Substrates must be coated to be ink receptive or require heat to transfer or cure; higher material and ink costs; limited outdoor life and weather resistance. Additionally, outdoor substrates are very expensive compared to their solvent counterparts.

Comments: If you don't print a lot or will not be attentive on maintenance; if you need to print indoors without ventilation, and have perhaps users with minimal training, an aqueous printer may be a good choice.

Solvent (mild, medium, strong)

Solvent inks are generally used for products where great durability is required, for direct-to-substrate printing (paper, vinyl, banner, canvas, fabric, and a host of exotic materials).

Size Range (Width): 30 inches to super-wide (five-meter).

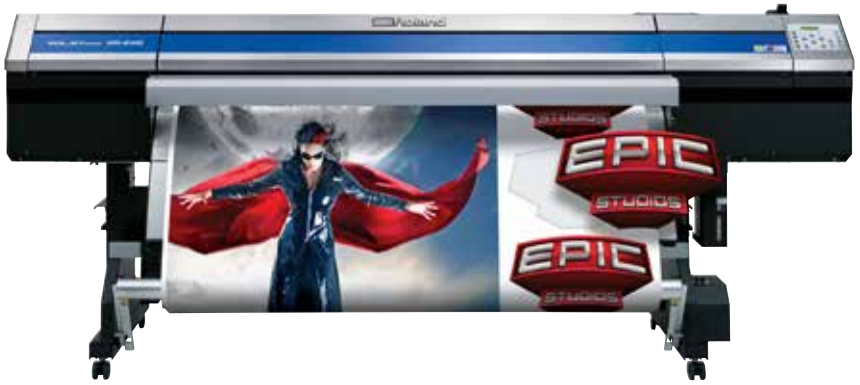
Common Applications: For years the workhorse of the sign industry — signs, banners, posters, vehicle wraps and myriad specialty applications, almost too numerous to mention.

Pros: Reasonable cost of entry; mature technology; very high quality and color fidelity now available; very wide range of available printing substrates other than UV and at low-cost; high-speed; low ink cost; white, gold and silver metallics now available; flexible ink excellent for vehicle wraps; fairly small shop footprint considering the wide variety of applications these printers are capable of; reasonably easy to use. For the most part, these require a PVC substrate to print on, or a coating on other materials.

Cons: Ventilation is recommended because of volatile emissions even with "odorless" machines; require steady and careful maintenance to protect expensive printheads; maintenance can be expensive; prints may require drying time before top coating; expensive RIP software required to drive printer and for color management.

Comments: Fast and cheap to run, with very good bang for the buck. If you are not one for maintenance, do not print a great deal or very often, you should not buy a solvent printer. They need to run to avoid ink drying and coagulation. Quality depends on design of printer and heavily on printhead technology (generally defined by ink droplet size measured in picoliters).

- Ten picoliters or less will give you fine quality, and droplets of 25 picoliters or more may be noticeable.
- Some of this can be covered up by the RIP.



UV Curable

UV curable inks are almost like liquid plastic. The ink, once jetted to the substrate, cures (dries) immediately upon exposure to ultraviolet light. UV inks are often very friendly to uncoated and unusual materials — coroplast, wood, glass, leather, painted substrates, plex, etc. — to which other inks won't stick.

Size Range (Width): 54 inches to super-wide (five-meter), though there are some smaller "desktop" units for such as buttons, pens, golf balls and ad specialties.

Common Applications: This ink technology is commonly used in flatbed

printers to print on flat substrates to eliminate the cost and labor to mount prints on vinyl. Very good for site signs, real estate signs, and virtually any type of flat sign or graphic, plus specialty applications such as printing on doors, glass and other flat substrates for special effects.

Pros: Printing direct to substrate greatly reduces handling and material costs; white ink and varnish coatings; spot colors and metallic available; printed products are cured immediately upon printing and require no outgassing or drying time; very good ink adherence to a wide variety of substrates. UV curable inks can almost even provide a "use your imagination" scenario with these printers. Excellent quality and color fidelity is now available with UV printers.

Cons: Fairly high cost of entry for initial investment; ink costs may be higher with some units; service and spare parts often limited to direct from manufacturers; high costs for service and spare parts; best use requires good training and competent operator; machines require steady and careful maintenance to protect expensive printheads; expensive RIP software required to drive printer and for color management; machines require a large footprint in your shop for material handling; ink is not very flexible, so these are not considered suitable for vehicle wraps, though improvements are being made in ink technology.

Comments: Printers are often of "flatbed" design, and are either pinch-fed or have a full table covered by a gantry system. There are hybrid printers that will do both flat and roll stock, and some have roll take-up systems. Though a fairly mature technology, many of these printers are highly technical, and you should consider the necessity of a skilled operator for one of these printers.

Latex

A comparatively new ink technology, latex requires additional heat in order to cure on most substrates.

Size Range (Width): 42 inches to super-wide (five-meter)

Common Applications: Very similar to solvent, the latex printer is becoming the workhorse of the sign industry — signs, banners, posters, vehicle wraps and a myriad specialty applications, almost too numerous to mention.

Pros: Reasonably media-friendly with most substrates previously used on a solvent printer; easy to use; fairly low ink costs; no volatile emissions, though there is some odor from the heat used to cure the inks; fairly low cost of entry; small shop footprint required; user-replaceable, self-calibrating printheads; lower cost of a single maintenance call, although the printheads have limited life.

Cons: Not as fast as their solvent counterparts; inks not as bright as solvent, though improving steadily; can be environmentally sensitive for ink curing and color management; occasional ink adherence issues with some substrates; high temperature required for curing may affect some substrates; dual 220 V service required for even entry-level units; expensive RIP software required to drive printer and for color management.

Comments: The latex printer has taken the industry by storm, and has, for many people, become the replacement for their solvent printer. One can pretty much take the list of applications for the solvent printer and apply it to latex technology. Latex printers are very popular in shops

of all sizes, and are generally friendly to most substrates. However, if you have an unusual substrate or specialty application, it is suggested that you fully test that application by having your substrate printed on one of these units and then testing it in its normal environment.

Thermal

A popular technology in years past, thermal printing appears to be somewhat revitalized with some limited offerings to the industry. This technology uses a foil-based ink system to generate the desired colors. I apologize, as I must admit to not having an in-depth knowledge of the current state of affairs of the products available. From the information I have been able to gather, thermal printing technology appears similar to that in the past, is now quite fast, and still can boast perhaps the best UV durability for uncoated ink on substrate. Some of the offerings I have discovered include white, metallic and spot color foils, and, of course, the lack of volatile emissions remains a significant benefit. No doubt this could be considered a specialty product and excellent for certain applications, and it just may be the right product for the niche that you are in. As with any print technology, you need to know your business and products, and develop a careful and thoughtful list of questions before making a purchase.

Another way to categorize printers is by the overall size. Generally, the smaller printers — of around 100 inches or less — are made by the same vendors that produced your solvent printer (if you had one). Printers of this size are considered of the "wide format" variety whereas larger units may be categorized as "grand format" or "super-wide."

A few rules of thumb often apply:

- The bigger the printer, the fewer technicians there will be for repair, the further they will have to travel to perform repairs, and the more expensive repairs will be. As I tell people, these are not washing machines, and there aren't repair guys on every corner. That applies even to the smaller — inquire with the seller about the service opportunities for any particular printer in your locale. All printers break eventually.
- The bigger the printer, the bigger your payment will be, so you had better be sure can feed it for the next few years while you are making payments.
- Taking this a step further, the larger and more exotic the printer and print technology, and the more limited the service opportunities, the more you may be held hostage by the manufacturer when it comes to response time, not to mention the cost of service and parts.
- For any of the available print technologies, it is a good idea to obtain references, not only for use of application, but also for the quality and cost of service and repair.

As I close things out, I will once more repeat some material from the first part of this article series. It is a wise idea to prepare a worksheet of your questions, so you don't forget anything as you speak with the sales rep. Let's review the basics:

- Know your business and what you need.
- Prepare yourself ahead of time for a meeting, demo or sales presentation.
- Select a partner that will be with you for the long haul.
- Do not buy strictly on price. It will cost you more in the long run if you don't buy what you need.
- Understand that this will be a process if you are to make an informed decision.
- Sleep on it one more night before you make that decision.

Good luck and happy printer hunting!

A 25-plus-year industry veteran, Bob Flipse was an early innovator in wide-format digital printing. Starting in aqueous, his knowledge now covers solvent, UV and other ink technologies. Flipse is currently a partner in Grafx Network, a nationwide service company for wide-format printing equipment. Much of their work is performed for dealers and manufacturers, some of whom outsource to them for overflow work while others use them as a primary service provider.

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