



Wide-Format Inkjet

## **I. Introduction: The Significance and Opportunities of Wide-Format Inkjet Printing**

Wide-format inkjet printing is proving to be one of the decisive moneymaking technologies today for commercial printers, in-house print departments, small and quick printers and other graphic communications professionals. Some of the options made possible by the technology were just creative suggestions and economic pipedreams a few years ago. Today they are creative and economic realities.

The ability to produce visually stunning billboards, trade show and convention displays, posters, banners, vehicle and building wraps, stage graphics, construction signs, advertising panels, point-of-purchase displays and dozens of other applications, with a combination of speed and photorealistic quality, yet *without* prohibitively high investment or production costs, has made wide-format inkjet the go-to printing technology of the 21<sup>st</sup> Century.

Why choose wide-format inkjet?

- It has already proven at a growing number of commercial print shops to win over many new customers who may not have considered those shops before the technology was brought in;
- It provides the ability to print directly on rigid and flexible media, which is becoming an essential service for printers who want to ensure a solid future in the business;
- It empowers printers to sell the services and to promise the quality that can make the difference between big profits and simply making ends meet.
- It presents several value-added marketing bonuses, such as the ability to print variable data, to do short runs, and to deliver just-in-time results, which many clients appreciate;
- It is a technology that eliminates the need to mount, which increases productivity and saves money;

- It encourages new creative possibilities, including the freedom to move beyond the limitations of white backgrounds on paper or vinyl;
- It allows the use of oversized rolls of paper, which is another way to increase productivity;
- It represents a more environmentally sensitive approach to printing, since the UV curable inks used for many systems have no volatile organic compounds (VOCs), and since inkjet printing generates much less waste than conventional printing;
- It is a user-friendly technology, despite also being a very sophisticated one, requiring minimal training of existing staff; and offering print shop management to have their systems up and running in a remarkably short amount of time;

## **II. Integrating Wide-Format: Market Potential and Customer Base**

Industry observers expect the digital printing market to triple in volume by approximately 2011. Outdoor advertising has shown uninterrupted growth over the last few years. More print buyers than ever before (including corporate advertising departments and advertising agencies) are showing an interest in what wide-format inkjet can do for them. That's why the time to enter the field is now.

Outdoor versatility and durability is a key element in the growth of the market. More print professionals are now starting to think about how they can use the technology to satisfy the needs of existing clients and to win over new ones. Applications include wrapping vehicles to promote outdoor events, wrapping buildings to promote indoor events, producing retail displays that are many feet tall and many yards wide to attract the attention of greatest number of shoppers, and much more.

And since the work is customizable, the technology will provide an endless supply of ideas for each individual client—ideas in which any print organization with a wide-format inkjet system can actively participate. That's why graphic communications professionals who currently are not taking advantage of the technology should gear up to move into the category as soon as the opportunity arises.

Also, the ability to be able to print variable data, to do short runs, and to deliver just-in-time results provide even more added value to the wide-format inkjet experience—added value that will be of significant interest to new clients, existing clients, the ad agencies they work with and other print buyers.

Bringing the technology in-house opens up new and immediate marketing opportunities. Print shop management will be able to pursue corporate clients in their region they had no hope of pursuing before. Current customers who previously had used only standard and conventional printing services can be approached once again with entirely new

advertising, marketing and promotional ideas that are attainable through the use of wide-format inkjet technology.

Before the final decision to enter the field is made, however, print shop owners must carefully consider what other services they may wish to make available in tandem with their wide-format inkjet capabilities. For example, being able to provide design services, database management and applications programming can only add to the value of offering wide-format inkjet printing.

As an industry, we are still undergoing a technological evolution toward even faster print engines, continually improved print heads, more cost-efficient inks and media, and more advanced software. This will result in even further growth for the wide-format market, with new applications, better quality and additional revenue opportunities.

### **III. Wide-Format Technologies and Applications**

Inkjet technology falls basically into two categories, drop-on-demand (DOD) and continuous flow.

Drop-on-demand technology is a method characterized by the expansion of the ink, thereby forcing the individual ink droplets through a special inkjet nozzle. DOD is much easier to control than continuous flow (which is used mostly for industrial applications involving packaging). DOD also prevents clogging, which is a relatively predictable occurrence with the continuous flow method.

In DOD, a device ejects ink droplets onto the substrate precisely where and when they are needed to create an image. The two most prevalent types of DOD printers are thermal and piezoelectronic. In thermal, ink drops are ejected from a nozzle by the expansion and collapse of a water vapor bubble on a small heating mechanism near the nozzle. In the piezoelectric method, electrical charges are produced, giving the ink droplets their adhering properties.

When selecting a wide-format inkjet system, purchasers and potential purchasers have an extensive range of factors to consider. Certainly print quality is one of the most important. In actual fact, however, that's one of the *easiest* parts of the decision-making formula: the print quality of most wide-format inkjet systems is uniformly excellent.

Other factors, then, on which to base the purchase decision include the following:

- The size and weight of the unit being considered;
- The maximum width of media the unit can handle;
- The printing speed of the unit;

- The additional features and options that may help workflow, satisfy client needs and open up new marketing and profit opportunities;
- The kind of consumables (film, vinyl, canvas, adhesive back, glossy) that can be used with the unit; the quality of those consumables as provided by the unit's vendor, and the applicability of using consumables from another vendor;
- The cost of purchase and cost of operation.

In slightly more specific terms, here are several of the most important factors to consider when deciding on a wide-format inkjet system:

### **High End vs. Entry Level**

Do you want a system that can be considered a workhorse, robustly designed to handle heavy-duty production in terms of speed, print run capabilities and the variety of media it can accept? Would you prefer an entry level unit, perhaps one that accepted rigid media only and is very attractively priced? Or are you interested in something in between? The answer may depend upon the results of the research you do to determine precisely what kind of wide-format inkjet printing will be more in demand for your particular needs, in your particular region, and one that will meet the physical limitations of your facility, as well as your financial resources.

### **Media Width**

What kind of wide-format projects will you be involved with more than others? Will you concentrate on jobs that require media widths of 62 inches (movie posters, for example) or as wide as 100 inches (billboards)? Would it be safer to purchase a system that can run *all* available media widths, or would it be closer to your strategic goals to concentrate on shorter-width projects only?

### **Image Sharpness**

Is photorealistic print quality important to you? It is to most users of wide-format inkjet—and most of the systems on the market today meet that expectation. Referring to the number of printed dots of ink per linear inch, the higher the dpi, the greater the image sharpness. Photorealism requires a higher dpi. As an average, the mid-to-higher-level systems feature 1400 dpi.

### **Borderless and Dual Board Printing**

Will you be depending on borderless and dual board printing? Most units allow both (borderless printing means no loss of time cutting, no wasted material and less manpower, and dual board printing allows feeding through multiple boards in the same print run).

### **Printing Speed**

How fast do you want jobs to run through the system? As a component of workflow and productivity, speed can be as important as all other factors in the selection of a wide-format inkjet system. Measured (depending on the system) by boards per hour or feet

squared per hour, the speed of a system can be as low as approximately 20 boards per hour to somewhat higher than 30, and from about 40 ft<sup>2</sup> per hour to more than 310 ft<sup>2</sup> per hour.

### **Size and Weight**

How large a system can you accommodate in-house? The differences in size and weight are substantial from unit to unit even among families of product from the same manufacturer. It is important to know what size your shop can effectively accommodate, as well as how much weight the floor can safely tolerate as the machine is moved from the truck to the production site. Wide-format inkjet systems can range between approximately 11 feet across and 22 feet across, and between approximately 1300 lbs and 7100 lbs.

### **Additional Features**

How important is it to you to have a system that includes feature options such as white printing, for projects that need to place images on transparent surfaces, cardboard and certain other media; or customer changeable lamps, which eliminates the need for a service representative to change UV lamps, thereby saving downtime? Other features may include automatic debris and ink residue removal, low ink indicators, auto printhead height control and several others.

### **Training**

Will your staff require training? Training is very important to a successful wide-format inkjet experience, and you may wish to research what kind of programs are available from the vendors you are considering. Is it included with the purchase? Are the trainers qualified with many years of training on their own?

### **Service**

Does the vendor you select have an effective service plan, giving you the confidence that technical issues and questions will be handled in a quick, efficient and highly professional manner?

### **Costs**

How much can you spend on a new system—and how much can you spend in ongoing production costs once the system is turned on? Cost of ownership and cost of production covers everything from depreciation/lease costs, repairs and maintenance, the utilities used to operate the system, insurance, consumables and more.

## **IV. Inks**

Basically there are four types of inkjet inks: water-based, solvent-based, oil-based and UV-curable, the latter being the most prevalent for wide-format. UV-curable uses electromagnetic ultra-violet light as its primary source of putting image on media.

Industry forecasters indicate that UV-curable technology will continue to gain market share worldwide. These inks are versatile, extending beyond CMYK to other colors that widen the palette for graphic communication professionals, allowing them to match custom colors and reproduce vibrant, eye-catching designs.

The benefits of this ink and its related inkjet technology are many:

- The ingredients used in most UV-curable inks have low toxicity for safe handling, low irritants and, because they are polymerized, low odor
- They are formulated using high quality pigments, ensuring high fade resistance for long-term outdoor applications
- The inks are very stable, allowing for fast curing and easy handling
- They allow for higher printing speeds
- They have excellent jetting performance and good adhesion on a wide variety of substrates
- They have excellent light transmission, good color consistency and less ink consumption per square meter
- Most are designed for easy loading, with no risk of mixing colors
- Shelf life, depending on the specific ink, ranges from 12 to 18 months

### **Environment**

It is also important to note that many of these inks are environmentally friendlier. UV-curable inks do not contain solvents or any ozone depleting agents and use no volatile organic compounds (VOCs). Nothing is released into the atmosphere. By contrast, solvent inks release 80 to 90 percent of its ingredients into the atmosphere as vapors during the printing process.

### **Substrates**

Unlike aqueous, solvent and oil-based inkjet inks, UV-curable inks can be printed onto almost any substrate, both flexible and rigid, coated and uncoated (papers, plastic substrates such as vinyls, polycarbonate and polyesters, as well as textiles, wood, glass, ceramics and more).

### **The Process**

After being jetted onto a substrate, the ink cures (or hardens) instantly via the strong UV light source, and its chemical components polymerize (or cross-link), resulting in solidification of the ink on the substrate

UV-curing is a very complex process. Many parameters affect the photopolymerization process, such as ink color, thickness of the ink layer, type of substrate, UV light source, exposure time, and atmosphere.

### **Drying**

UV-curable inks dry in seconds—the direct result of the curing process, which uses high-powered UV-lamps. These instant drying characteristics of UV-curable inks permit high-speed printing, whereas high-speed solvent systems require excessively large dryers to speed the drying process. Solvent-based printers require dryers to remove the large amounts of solvents from the substrate. This drying process can take several minutes.

### **Color Consistency**

UV-curable inks are cured so fast that the ink droplet is more on top of the substrate. As a result, color is more consistent from substrate to substrate and less ink is needed to cover the same image area. Due to the slow drying of solvent-based inks, these inks dissolve in the substrate so that the colorants actually mix with the media rather than lie on its surface.

### **Cost Efficiency**

One criticism of UV-curable inks is that they are generally more expensive than solvent inks. As UV inks proliferate the market, their cost will decrease. However, the cost of operating a UV system is actually lower than solvent systems for a number of reasons:

- UV inks dry rapidly, making UV systems faster with higher productivity
- they print on any paper and any surface, eliminating the need for more expensive inkjet coated paper to produce optimal results
- they can print on rigid materials, eliminating the need for mounting for a number of applications
- they have greater color fidelity, which means more accurate renderings on the first sheet
- ink consumption is significantly lower.

The slightly higher cost of UV inks, therefore, is more than compensated for as a result of its productivity, versatility and quality advantages.

### **The Future**

Because UV-curable inks are still in a development stage, improvements such as flexibility, adhesion and outdoor durability are on the horizon. Further developments will bring special inks such as unusual colours and special-effect inks.

### **Conclusion**

While solvent inks have been more popular for long-term outdoor applications, advanced technical developments and stringent R&D testing have shown that the quality characteristics of UV-curable inks rival their solvent-based counterparts in three

important areas: rapid drying characteristics, which allow unencumbered high-speed printing, substrate versatility (direct adherence to both flexible and rigid materials), which greatly widen applications and eliminate the time-consuming step of mounting a printed substrate on a hard base, and the environmental benefits of producing no VOCs.

The advantages of UV-curable inks, therefore, far outweigh any disadvantages, positioning them as the dominant consumable for the future for industrial, wide-format inkjet printing.

## **V. Basic Requirements**

Many of the considerations in selecting a wide-format inkjet system relate to space requirements, power requirements and variables such as temperature and humidity.

Sales and technical personnel at most vendors will discuss these considerations prior to any purchase and installation—but that does not preclude the responsibility of the customer to cover as many bases as possible, as early in the process as possible. That will speed up the entire installation and avoid potential problems down the road.

- You should be prepared to provide a map and driving instructions to your location, as well as a chart or schematic of the interior layout of your facility;
- Simply getting the new equipment into the print shop can be a major undertaking, and the facility may need a forklift of its own, as well as material to uncrate and unpack the machine;
- Printers must consider whether or not they have doorways and hallways large enough for the equipment to pass through on its way to the designated wide-format room. Hallways must be level, corner-free and threshold-free. For example, the minimum door width for delivery of an Agfa Anapurna M is 43 inches (if the unit is crated) and 42.5 inches (if uncrated), while the door height must be seven feet (crated or uncrated). Crates that transport these systems have a wide turning radius. Double-width doorways are often required, and if they're needed and *not* available, doors and sometimes even door frames may have to be temporarily removed. Landlords, building owners or building managers may need to be contacted;
- Wooden floors should be avoided because of the considerable weight of most units. You should find out the pounds-per-foot pressure tolerable on all the floors over which the unit will pass, up to and including its final installation space. Architects, landlords or building engineers may need to be contacted. Also, floors on which systems are placed must not attract dust or produce static electricity, and they must be vibration-free;

- The size of the room in which the system will be set and operated is, of course, a major consideration. The floor space necessary for one system may be as much as 16 x 18 feet, while other systems will require smaller rooms or larger ones. Wide-format inkjet systems also need a UV cooling unit (sometimes called a chiller), which needs extra space and must be placed, installed, maintained and operated according to the specifications that come with the unit. There are different specs for different systems..
- There should also be good ventilation and exhaust, and sometimes (depending on the system) a high-power vacuum dust/chip extraction system may be required;
- For most wide-format inkjet equipment, room temperature conditions must be within the range of approximately 68° F to 83° F. You should know your system's requirements before finalizing the purchase and make sure the wide-format room can maintain those ranges. The capacity and efficacy of your existing air conditioning and heating system must be accurately assessed. Sometimes you may need a qualified HVAC technician to help boost an HVAC system's ability to maintain the proper levels. There must also be an adequate air supply;
- Know the humidity levels of the room, and measure that level against the humidity requirements of the system you intend to purchase. Some systems require higher or lower room humidity levels than others. Some shops face the additional challenge of having two or more printers in the same room, each with a different humidity requirement. The humidity levels required may range from 40 to 90 percent—some systems a little more, some a little less.
- Most systems require a power supply of 230 V, 50-60 Hz. In some cases (particularly where power has to be supplied to a new area), a special transformer to boost available power may have to be purchased and installed, and it might be necessary to have a qualified electrician on site. The electrician should be notified as to the exact nature of the work to be done, as not all licensed professionals will be qualified or prepared to handle the special needs of a wide-format inkjet system. Consult with you vendor or installer first. Check to see if proper power cords come standard with the system (some don't), or if you and/or your electrician will have to supply one. Also, cooling units and, at times, other accessories may require separate power connections.
- Depending on the system installed, an Ethernet connection may be required; operators in the shop should understand network requirements and know how to use, troubleshoot and optimize them.
- Wide-format inkjet systems can be loud, particularly because of the compressors that are used. If there are offices next door or nearby to the inkjet production room, or if the shop is in a building shared with other businesses, there may be noise and vibrations that are very distracting. Purchasers and potential purchasers must take this into account and perhaps consider steps to minimize the effects.

In summary, when considering the purchase, delivery and installation of a new wide-format inkjet system, information on all of the following should be established prior to making any final selection. These concern not just the actual selection and the steps necessary to install the system, but also the means by which to optimize the marketing opportunities of your wide-format inkjet investment:

- Accessibility in the wide-format room for equipment servicing
- Air conditioning and heating
- Air flow
- Altitude (higher altitudes may require special considerations)
- Capabilities of competitive print shops in the region
- Convenience of truck delivery
- Cost of purchase and estimated cost of operation
- Exhaust
- Floor space
- Humidity
- In-house power supply
- In-house resources for promoting wide-format availability
- In-house waste disposal capabilities
- Knowledge of PCs and networking environments
- Knowledge of RIP software
- Knowledge Windows and Windows NT applications
- Local electrical regulations
- Local environmental regulations
- Local ordinances for the outdoor use of billboards and other large-format displays
- Local waste disposal regulations and requirements
- Measurements of transit areas from loading dock to installation room
- Need for extra tables, cutters, shelving
- Network requirements
- Regional market for wide-format printing
- Room size
- Skill sets of current staff members
- Sources of additional information (see following section)
- Storage area availability (and square footage) for extra parts, consumables
- Temperature
- Transformer requirement
- Vendor financial plans
- Vendor service plans and resources
- Vendor training resources

## **VI. Skills and Training**

Most vendors have resources designed to provide training for their wide-format inkjet customers. The best ones help them develop customized solutions to meet specific needs and to continue to provide training, guidance and consulting.

Knowledge and experience are integral to making the wide-format inkjet experience work seamlessly in a professional print environment that previously had not had a system in-house. While it is true that the knowledge and experience must begin with the vendor, customers must also have a significant amount of skills and training in order to outline and implement the new efficiencies, to enhance productivity and to maximize the value added services that are part of the experience. Each and every customer is different, with different goals and challenges. (In the final section we discuss the training resources made available by Agfa.) Training and consulting can have a positive influence on business operations and production capabilities, resulting in a solid impact on the bottom line, and it should always be part of the decision-making process during a wide-format inkjet purchase.

## VII. Industry Resources

*Organizations, associations and websites that may be of interest and value to print professionals who are now or may plan to become involved in wide-format inkjet printing:*

**American Institute of Graphic Arts (AIGA)**, a professional association for design professionals to exchange ideas and information, and advance education and ethical practices in graphic arts. [www.iga.org](http://www.iga.org)

**American Print Alliance**, a consortium of nonprofit printmaker councils that sponsors national and international project and exhibitions. [www.printalliance.org](http://www.printalliance.org)

**Association for Graphic Arts Training**, which proactively addresses the need for employee productivity with regard to advancing technologies. [www.agatweb.org](http://www.agatweb.org)

**Association of Graphic Solutions Providers (IPA)**, an international trade association representing creative, promedia and print service providers who specialize in digital workflows. [www.ipa.org](http://www.ipa.org)

**Color Marketing Group (CMG)**, an international association for color design professionals. [www.colormarketing.org](http://www.colormarketing.org)

**FLAAR Digital Imaging Resource Center**, a university-affiliated organization that reviews and evaluates digital printing and photography products and consumables. <http://www.wide-format-printers.org/BowlingGreenStateUniversityOhio/BGSUdigitalimaging.htm>

**Flexographic Technical Association (FTA)**, a leading technical society dedicated to the flexographic printing industry. [www.flexography.org](http://www.flexography.org)

**Graphic Arts Education and Research Foundation (GAERF)**, an organization devoted to advancing knowledge and education in graphic communications by supporting programs that prepare the workforce of the future. [www.gaerf.org](http://www.gaerf.org)

**Graphic Professionals Resource Network (IAPHC)**, an international organization that promotes self-development and success for individuals and companies in the printing and graphic arts industry. [www.iaphc.org](http://www.iaphc.org)

**Graphics.com**, an online shared resource for creative design professionals. [www.graphics.com](http://www.graphics.com)

**IDEAlliance**, an industry organization that develops, educates and validates best practices in publishing and information technology. [www.idealliance.org](http://www.idealliance.org)

**In-Plant Printing and Mailing Association (IPMA)**, an association that endeavors to meet the needs of the in-plant community with solutions and an exchange of ideas. [www.ipma.org](http://www.ipma.org)

**International Color Consortium**, an organization for the creation, promotion and encouraging the standardization of an open, vendor-neutral, cross-platform color management system architecture and components. [www.color.org](http://www.color.org)

**National Association for Printing Leadership (NAPL)**, a trade association serving companies that strive for excellence in graphic communications management. [www.napl.org](http://www.napl.org)

**National Association of Quick Printers (NAQP)**, an organization that provides quick-print and small-sized commercial printers with knowledge, tools and resources for success. [www.naqp.com](http://www.naqp.com)

**Printing Industries of America/Graphic Arts Technical Foundation (PIA/GATF)**, the world's largest graphic arts trade association. [www.gain.net](http://www.gain.net)

**Print Services and Distributors Association (PSDA)**, an international organization of print distributors, trade printers and suppliers working together to ensure successful products and services. [www.psd.org](http://www.psd.org)

**Society of Publication Designers (SPD)**, a group dedicated to promoting and encouraging excellence in editorial design. [www.spd.org](http://www.spd.org)

**Specialty Graphic Imaging Association**, an international association for specialty imaging. [www.sgia.org](http://www.sgia.org)

**WhatTheyThink.com**, a member-driven website that delivers comprehensive industry news and marketing intelligence for the printing and publishing industry.  
[www.whattheythink.com](http://www.whattheythink.com)

### *Magazines*

**Advanced Imaging**, information on imaging hardware, software and peripherals.  
[www.advancedimagingpro.com](http://www.advancedimagingpro.com)

**American Printer**, authoritative source of information on integrating modern and advanced technologies with today's management challenges. [www.americanprinter.com](http://www.americanprinter.com)

**Communication Arts**, covers creativity and resources for everyone involved in visual communications. [www.commarts.com](http://www.commarts.com)

**Digital Graphics**, provides tips, tools and strategies for professionals involved with digital graphic production. [www.nbm.com](http://www.nbm.com)

**Digital Output**, focuses on up-to-date information for wide-format printing and applications, including trade show graphics, vehicle graphics, POP displays and more.  
[www.digitaloutput.net](http://www.digitaloutput.net)

**Graphic Arts Monthly**, comprehensive coverage of all applied technologies for the printing industry. [www.graphicartsmag.com](http://www.graphicartsmag.com)

**Graphic Communications World**, information for senior industry executives in graphic arts, printing, publishing and converting industries. [www.gcworld.biz](http://www.gcworld.biz)

**Graphic Design USA**, a news magazine for creative professionals. [www.gdusa.com](http://www.gdusa.com)

**In-Plant Graphics**, leading graphic arts magazine specifically for in-plant reproduction departments. [www.ipgonline.com](http://www.ipgonline.com)

**Interface**, Agfa's international publication for media arts.  
[http://www.agfa.com/en/gs/knowledge\\_training/interface/index.jsp](http://www.agfa.com/en/gs/knowledge_training/interface/index.jsp)

**Newspapers & Technology**, international journal of newspaper technology.  
[www.newsandtech.com](http://www.newsandtech.com)

**Print Magazine**, bimonthly covering visual culture and design. [www.printmag.com](http://www.printmag.com)

**Printing Impressions**, one of the most influential and widely-read publications for commercial printers. [www.piworld.com](http://www.piworld.com)

**Printing News**, weekly imaging-to-finishing publication for the graphic communications industry. [www.cygnusb2b.com](http://www.cygnusb2b.com)

**Quick Printing**, magazine for quick printers, small commercial printers, in-plant printers and copy shop owners and managers. [www.quickprinting.com](http://www.quickprinting.com)

**Screen Printing**, information for professionals in the screen printing industry. [www.stmediagroup.com](http://www.stmediagroup.com)

**Wide Format Imaging**, reports on news, trends, products, services and management issues for wide-format industry professionals. [www.wide-formatimaging.com](http://www.wide-formatimaging.com)

## VIII. Conclusion

Thanks to the new digital options, printing methods and applications that were little more than ideas a few years ago are now daily realities. They are realities that deliver a combination of quality and speed that most printers will find relatively easy to achieve. With wide-format inkjet, printers can now offer their clients vibrant, interesting and eye-catching point-of-purchase signage, posters, banners, advertising specialties, fleet decals, building wraps, trade show displays and much more. The benefits of Agfa's inkjet technology include reliability, high productivity, low waste, greater pigment load, thinner coating, better light transmission, wider color gamut, less banding, and easy laminating, cutting, folding and flexing,

Agfa has invested heavily in research and development into wide-format digital printing technology and we are the established experts in the field. One reason we've concentrated on the technology is because we are convinced that it can be adapted into virtually any print organization, regardless of size, space availability, financial capital, the skill level of current staff members, or the kind of wide-format inkjet work that is being added to the list of strategic goals.

Our own goal is to provide a complete solution for wide-format inkjet, including leading edge training, service and customer support. This includes installation and maintenance by Agfa's worldwide service team, spare parts, customer training and financing tools. For training and consulting to be effective, it must stay focused on several key elements that make the difference between average and superlative training and consulting, and Agfa has a group called Expert Services which offers exactly that. It provides an unbiased assessment of a customer's workflow and automation; helps customers develop customized solutions to meet specific needs; and is comprised of true experts who understand the technology, the art and the *business* of print.

Expert Services offers workflow and process automation training, guidance and consulting on all workflow and automation platforms and components of the Agfa wide-format inkjet systems. They work within a system's existing infrastructure whenever possible.

With the recent additions of the :Anapurna M and the :Anapurna XL<sup>2</sup> to the distinguished :Anapurna family of wide-format inkjet systems, Agfa now has one of the most extensive industrial UV inkjet portfolios in the industry. These include the :Anapurna L, XL, XLS, XL<sup>2</sup>, M, Mv and M4f. We also have the M-Press, a high-speed flatbed press that Agfa co-developed with Thieme in response to customer demand for economical, high run-length digital printing.

In short, there is an Agfa wide-format inkjet system for all printers and for any need. As previously discussed, customers must select the system that is right for them, based on a wide variety of specifications and features. For example:

- The **workhorses** of the line are the :Anapurna L, XL, XLS and XL<sup>2</sup>, each one robustly designed to handle heavy workloads with a wide variety of media. Of the four workhorse systems, the XLS can handle the **widest media**—up to 100 inches wide. It is also the largest and heaviest system—just over 22 feet across and weighing in at about 7054 lbs.
- The XLS, Mv, M4f and M have **dpi** that ranges up to 1440, giving them the photorealistic print quality that is so important to successful wide-format inkjet marketing. Of these, the M4f is designed for rigid media only, and the Mv offers spot and overall varnish with two extra varnish printheads for gloss effects.
- While as durable and flexible as the other :Anapurna printers, the M4f is attractively priced and exceedingly easy to use, giving it a reputation as an excellent **entry-level** wide-format inkjet system. It measures in at just over 11 feet long and weighs about 1364 lbs.
- The :Anapurna L, XL and XL<sup>2</sup> feature **white ink printing**. With this option, projects that need to place images on transparent surfaces, cardboard and certain other media can utilize white printing for truly vivid and effective words and artwork.
- The L, XL, XL<sup>2</sup> and M4f feature **customer changeable UV lamps**, a process that eliminates the need for a service representative to change and saves on downtime.
- The :Anapurna XLS has a **flush brush** feature for automated maintenance that removes debris and ink residue on the nozzle plates and in the nozzle cores. The XLS is also noted for having a **quick start-up time** that is among the shortest in the product category: 15 minutes from cold to standby. All of Agfa's Anapurna wide-format inkjet system (except the XLS) also have a **head positioning device** that keeps the nozzle plate of all heads 100% parallel with the substrates at all times.
- With the M-Press, Agfa's advances in digital imaging and inkjet technology are coupled with Thieme's design and manufacturing expertise in **screen printing**,

resulting in a unique high-speed flatbed inkjet press whose modular design expertly combines digital printing with the screen printing capability. It is the only hybrid press with optional screen printing in-line for special in-house colors, spot colors, metallic inks and more.

As far as Agfa's inks are concerned, because of its many advantages and what our R&D engineers consider its future potential, we have chosen to concentrate on piezoelectric UV-curable inks. Our roots in the chemistry industry provide an extensive knowledge base for advanced ink formulations. In addition, with our ability to make our own inks, each ink product is dedicated and optimized to the individual engines in which they're used—a claim very few other companies can make.

The ingredients used in Agfa's UV-curable inks have been specifically selected to have low toxicity for safe handling. These compounds are also selected to have very low irritants. Like all inks, Agfa's UV-curable inks have an odour, but once cured, all volatile ingredients are polymerized, making them far less pungent than solvent-based inks.

Agfa-produced UV-curable inkjet inks are stable, allow fast curing and are easy to handle. The excellent jetting performance and good adhesion on a wide variety of substrates enable a wide range of applications. The high image quality, vibrant colors and perfect edge sharpness, combined with good outdoor light stability, guarantee heavy duty industrial printing results.

Having highly advanced systems and consumables is just the first step in a successful wide-format inkjet experience. The second step is when graphic communications professionals and Agfa professionals work together to bring the experience in house. It is by just such a partnership that the selection, delivery, installation and daily usage of wide-format inkjet becomes a successful proposition, and a proven way to bring the future of print into the print shops of today.

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