Large-Format Printing Market Gears Up for Growth


By John Chatzidakis

Recommendations

To maintain and improve their market position, large-format vendors should:

- Respond to the growing trend of customized, short-run print jobs by developing faster and more flexible printing systems.
- Include ultraviolet (UV)-curable and flatbed technologies when developing printers and inks that offer customers increased output and revenue.
- Have an effective communication strategy that outlines the technological and cost benefits of large-format printing.
- Focus on developing environmentally friendly technologies. This applies especially to vendors specializing in solvent-based inks for outdoor use.
Large-Format Printers Have Wide-Ranging Uses

Large-format printers are normally defined as having a minimum print width of 24 inches. They are used for a wide and evolving range of applications that can be grouped into two main areas: technical and scientific, and graphics.

Technical uses include architectural drawing, mapping, scientific imaging and weapons design. Uses in the graphics segment include trade shows, exhibits and fleets, point-of-purchase displays, posters, banners, signs, billboards, backlit graphics, packaging, fine art, textiles, floor graphics and wall coverings. Large-format printers are also used for specialized processes, such as printing on circuit boards.

In the technical segment, large-format printers are mostly found in-house. Users include architectural firms, educational establishments, government agencies, scientific institutes and industrial conglomerates in sectors such as aerospace, defense and manufacturing.

In the graphics segment, there is a thriving market of external printers that work on a contract basis. In-house users are mainly corporate departments, photo laboratories and a growing number of individual photo enthusiasts.

The large-format market has received much media coverage because it has been rapidly introducing new products and technologies. This document focuses on the graphics segment, which has been at the center of most technological developments.

Large-Format Segment Has Scope for Growth

Large-format printing is one of the fastest-growing segments in the print industry, despite weak hardware sales during 2002. The graphics segment was affected more than the technical segment because of continuing tough conditions in the advertising market. According to vendors’ reports, consumables and software prevented the market from decline.

Although most vendors are anticipating an upturn in the industry during 2003, the likelihood of a total recovery will depend on the global economy’s performance. The graphics segment has the highest potential because new forms of outdoor advertising are creating market opportunities for large-format vendors.

Hardware Technologies and the Piezo vs. Thermal Debate

The large-format market is almost totally dominated by inkjet printers. Solid ink and thermal transfer technologies are almost obsolete and electrostatic printers, once touted as the future of digital large-format printing, seem poised to follow suit. Though more successful, photo laser printers have been confined to a niche market of commercial photo laboratories.

Epson and Hewlett-Packard (HP) are the leading suppliers of hardware technologies for the corporate and photography markets. Epson is the leading manufacturer of piezo electric print heads. It supplies these print heads to a broad range of printer vendors, including Accuplot, Agfa, Gradco, Gretag (now part of Océ), Mimaki, Mutoh and Roland.

HP is the leading thermal inkjet vendor, and ColorSpan uses its print heads. Encad is the second-largest thermal inkjet vendor, and uses Lexmark print heads. Canon, meanwhile, manufactures its own thermal print heads.
The debate about whether one of these technologies would push the other out of the market gained momentum during 2002. In February 2002, ColorSpan announced that it would switch its R&D efforts from thermal to piezo technology, and that it would introduce a piezo printer by the end of the year.

But ColorSpan instead chose to launch DisplayMaker x-12, an updated version of its flagship thermal DisplayMaker Mach 12, in December 2002. It did not launch its first piezo printer, the DisplayMaker 110s, until April 2003.

Kodak’s venture into the piezo inkjet arena with its own large-format system, the 5260 printer, also contributed to the debate. Kodak’s model features 12 newly developed 300-nozzle print heads based on Spectra technology, but made by Brother. Through this system, Brother has emerged as a potential competitor to Epson. But Kodak has been forced to halt production of the 5260 printer because the print heads have apparently been affected by banding problems. The resulting uncertainty as to whether the product will eventually reach market has endangered the company’s large-format strategy.

The problems surrounding the Kodak 5260 illustrate the technical complexities of piezo print heads, and the higher R&D costs of this technology compared with thermal technology. Piezo print heads are more sensitive than thermal ones, which can result in a shorter life span or higher running costs.

Each of the technologies has its merits. Advocates of thermal technology claim higher speed and reliability, while those in favor of piezo technology report higher quality. But as neither technology yet has a clear advantage, and without a major shift in hardware vendors’ preferences toward either, Gartner believes the two will continue to co-exist in the near future.

Inks and Media Fuel New Applications
The continuous development of inks and substrates is one of the major drivers of growth and new applications in large-format printing.

Growth of Eco-Solvent and UV-Curable Inks
Solvent and UV-curable inks are receiving much attention. An increasing number of manufacturers are introducing ranges of eco-solvent and pigmented UV-curable inks. These can reduce production costs and shorten the output process, thereby generating additional profit for print providers. In addition to their long outdoor durability (three to five years) through resistance to water, abrasion and fading, many of these inks do not require lamination.

These inks are also improving in terms of color accuracy, which has traditionally been one of their weaknesses. This is because ink manufacturers have had to get the pigment particle size to fit print heads that were originally developed for dye-based inks. Although the color accuracy of UV and solvent inks still needs some improvement before it matches that of screen-printing ink, the latest inks offer an increased color range that is capable of meeting the requirements of most applications.
More importantly, solvent ink developers have made great efforts to reduce the
toxicity and strong vapors of their inks, which often require the use of special
purification and ventilation systems. Roland’s SOL INK, used in its SOLJET printers,
is of low volatility and is much less toxic than older inks of this type. Therefore, it
does not need to go through a purification process. Other vendors using eco-solvent
inks include Mimaki, Mutoh, NUR Macroprinters, Océ, Scitex Vision, Tiara Systems
and Vutek.

However, unlike pure solvent inks, eco-solvent ones cannot be used on uncoated
media. Solvent inks are still the most popular choice for products like banners and
building wraps, but UV-curable inks are about to change this.

UV-curable inks are environmentally friendly solutions, and are rapidly catching up
with their solvent counterparts in terms of durability, accuracy and flexibility. Most
UV inks now guarantee an average outdoor duration of three years. This time span
exceeds that required by many, if not all, applications. Their growing popularity is
highlighted by the fact they have become the leading choice for the emerging
flatbed segment. Gartner believes an increasing number of vendors will invest R&D
resources in UV-curable ink at the expense of solvent inks.

**New Print Media Increase Demand for Large-Format Printing**
The pace at which new media are being introduced to the market is remarkable. In
its infancy, large-format printing was almost exclusively associated with coated
paper. But today it is used with materials as diverse as billboards, canvas,
translucent backlit film, self-adhesive vinyl, nylon, mesh, carpet, corrugated cartons,
textiles, wood, ceramics, glass, metal, tiles and circuit boards.

The proliferation of these new media is unleashing the tremendous potential of
applications like fleet decoration, flex-face billboards, building coverings,
packaging, signage and window graphics, which are expected to accelerate the
growth of the large-format industry. As a result, there is increasing demand for
outdoor media, including adhesive vinyl, backlit film and opaque paper-based
substrates.

At the other end of the market, indoor and photographic applications are benefiting
from the launch of instant-drying nanoporous paper, which can be laminated or
used immediately after printing.

**Flatbed Printers May Be Next Big Thing**
Until recently, screen printing was the main method for printing on clothing,
textiles and rigid materials like ceramics, glass, metal, plastic and wood.
Conventional printers could not handle such substrates, and no other type of ink
could challenge the longevity and color pigments of screen printing inks.

But recent developments in digital large-format printing technology are posing a
formidable challenge to screen printers. The emergence of flatbed large-format
systems that can print on virtually any surface is opening up screen printing’s
previously exclusive market. These new systems can be used for outdoor printing,
decoration, packaging, textile printing and industrial applications.

Digital technology’s benefits are flexibility, ease of use and shorter turnaround
times. This is because digital files are easy to revise at the last minute and can be
sent directly to the printer as many times as desired. With shorter, faster and more
customized runs becoming the norm, these benefits are crucial.
New Models As Technology Is Refined

Large-format hardware vendors have quickly acknowledged these market opportunities. U.K.-based Inca Digital launched the first flatbed system, its 44-inch (1.12m) Eagle 44 UV-curable printer. The first installation of this system took place in April 2001. A rising number of other established large-format vendors have introduced, or are about to introduce, their own models.

Swiss manufacturer Zünd has developed the 85-inch (2.15m) UV jet 215 C flatbed system. Like the Eagle 44, this uses print heads produced by Xaar and Sericol UV inks.

Scitex Vision introduced its VEEjet flatbed UV printer in October 2001, and NUR Macroprinters’ Tempo flatbed UV printer is scheduled to start shipping in 2Q03. Océ’s 62-inch (1.58m) Arizona T220 solvent system uses Xaar print heads, and should be launched during the first quarter of 2003.

Inca Digital has introduced two further models, its Eagle H, a higher-quality version of the Eagle 44, and its 63-inch (1.60m) Columbia printer. The latter uses Spectra print heads, as opposed to the Xaar heads used in the Eagle printers.

Other developments include combined roll-to-roll/flatbed printers, like Vutek's PressVu and PressVu UV, and Leggett & Platt’s Virtu TX and Virtu RS. Since November 2002, 3M has been selling a six-color version of the Virtu RS as the 2500UV.

Another development anticipated to further lessen gap in color consistency between screen printing ink and solvent and UV inks is the introduction of six- and eight-color flatbed printers. Océ's Arizona T220 and 3M's 2500UV are six-color models, and NUR's Tempo is eight-color. These printers offer a fuller, smoother color range than four-color systems.

Ongoing R&D by ink vendors should result in further technological improvements, especially for UV-curable inks. These inks are already dominating the flatbed segment. Their perfection should accelerate the adoption of digital flatbed technology by screen printers. Consequently, Océ could be the first and last vendor to offer a solvent-based flatbed system. Unsurprisingly, it is also researching UV technology, with a view to developing a UV-based flatbed system. But Océ’s delay in launching this technology is benefiting its competitors, which are gaining a valuable head start.

The buzz of activity surrounding flatbed printers is certain to intensify as the technology is refined. With almost all these models due to start shipping during 2003, it will be an important year for flatbed large-format technology, and the most challenging yet for screen-printing technology. Flatbed printers are opening up a new market to large-format vendors, who cannot afford to ignore its potential.
Gartner Dataquest Perspective

The large-format market represents a significant opportunity for printer vendors. Unlike many other segments of the printing industry, it is relatively new and unsaturated. The growth of this segment is being driven by the constant emergence of new applications and technologies.

There is increasing pressure to reduce prices in the low-end of the market, which has become highly competitive. Epson and HP are constantly introducing new products, with superior technological capabilities, at lower price points. As a result, other vendors are finding it difficult to challenge their market dominance. Prices should fall even more as these two leaders try to expand into the small business and photo enthusiast markets.

At the other end of the market, users of industrial, large-volume and outdoor applications are not as price-sensitive, which means print vendors have not been experiencing any significant price erosion. Users’ willingness to pay for cutting-edge technologies makes it easier for vendors to recoup their R&D costs.

Recommendations

To maintain and improve their market position, large-format vendors have many issues to consider when formulating their strategies:

- The trend toward short-run, customized print jobs requires flexible printing systems that can rapidly deliver a range of tasks to a very high standard. Vendors need to be able to respond to customer demand for different applications by developing faster machines for use with a variety of inks and substrates.

- UV-curable and flatbed technologies currently offer the best opportunities for growth in the large-format market. Vendors should include these technologies when developing printers and inks that offer users increased output and revenue. This applies especially to vendors that wish to establish or maintain a leading position in the outdoor applications market.

- Many smaller printers are still uncertain about making the transition to large-format printing. They fear high acquisition and running costs, and perceive digital large-format technology to be complex. Other print providers only use their large-format equipment for proofing jobs, unaware that they can make money by printing and selling final jobs. To capture the potential of this market, vendors need to have an effective communication strategy that will clearly outline the technological and cost benefits of large-format printing. Exhibiting at shows traditionally reserved for rival processes (for example, the Federation of European Screen Printers Associations Exhibition) can help in building contacts and generating interest.

- With the printing industry becoming more environmentally conscious, vendors need to focus their efforts on developing environmentally friendly technologies. This applies especially to outdoor vendors specializing in solvent-based inks. Many of them have already responded to this challenge by introducing eco-solvent and UV-curable inks that reduce or eliminate the problems of toxicity and secure waste disposal. But more work is needed in improving media compatibility and print quality if these inks are to be widely adopted.

Key Business Issue

What strategies are vendors implementing in order to succeed in this market?