# PUTTING TECHNICAL PRODUCTION TO THE TEST

## Sophie Matthews-Paul explains why the latest ink-jet developments are set to challenge wide-format LED printing

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**The arguments between LED and ink-jet printing in the technical wide-format arena have resulted in general impasse until now because, quite simply, the legacy of this kind of toner-based system has become rooted as the *de facto* standard in its industry sector. Ink-jet was never considered a viable alternative because of its lack of speed and line quality but these disadvantages have now been countered successfully by the HP Designjet T7100 which is able to output 165 A1 sheets/hour consistently and flawlessly.**

The perceived strengths of LED (light emitting diode) printing technology have been speed and reliability but the introduction of HP's Designjet T7100 now brings a reliable, low-cost and fast alternative to market. By using the company's latest ink-jet technology, the relative simplicity of the machine's configuration removes the complexities involved when running a toner-based system. Significantly, power consumption is reduced because there are fewer electrically driven elements and, of increasing importance, there is also no ozone generated from the high voltages which are applied to the corona wires when charging the paper.

There are several important factors behind HP's key to success in the technical wide-format printer market and it is inevitable that the company's advanced ink-jet technologies would come to challenge the more traditional print methods in the technical arena. The main principle has been to meet the same, if not better, throughput speeds of LED production without compromising image quality or consistency during the printing process.

### COMPARISONS

When comparing these two technologies, wide-format LED printing has maintained its position in the technical sectors because, as a toner based system, there has been no other solution thus far which provides the same speed, quality and size quotient. The process uses an array of light emitting diodes to produce the image as a series of electrical charges which contain the toner particles. These are transferred to the paper as photoconductor charged pixels and the media surface is charged via a set of corona wires so that the toner is discharged and fused to become a finished print.

*The HP Designjet T7100*


*Ink-jet is a low maintenance, contact-free method to transfer the ink via a printhead*

In comparison, ink-jet printing is a relatively logical and simple process and is one which has been fined-tuned to make it a standard output method for high quality colour and monochrome across many printing and technical industry sectors. It uses a low maintenance, contact-free method to transfer the ink via a printhead and its nozzles onto a given media surface without the need for complex elements and continuously moving rollers or drums.

Using ink-jet technology, the cartridges are clean and closed, passing ink to the printhead in a pressurised, sealed environment. The position of the nozzles within the print-head are determined so that the ink is jetted onto the material in precisely the right location, and this is achieved by scanning the print-head along the paper before the droplet is fired and the ink is fixed onto the media surface.

### CHALLENGES

The reason that HP can now successfully challenge the high-speed demands of LED production lies with the company's scaleable printhead technology. A cruicial element within the new Designjet T7100, the formula and practical use of this high quality thermal head has already been well proven in other products with the company's portfolio. Its diversity is now acknowledged in machines including the Z family of Designjet printers, HP Photokiosk and the more demanding requirements found in the T200 and T300 web presses.

High speeds and excellent reliability are boosted by the incorporation of HP's

proprietary Double Swath Technology which increases the speed of throughput by reducing the numbers of scans per sheet. These high rates need to be extremely accurate, and this is achieved by the company's Optical Media Advance Sensor which follows the movement of the media and automatically adjusts and corrects the moving paper to remove unwanted artifacts.

Typical failures with LED printers are that even the slightest scratch to the photoreceptor or a failed diode within the writing head can lead to the appearance of vertical white lines. Toner is reliant on its ability to be contained within the transfer system and background noise can be caused by its migration away from the area which is being printed. This, and a worn photoreceptor, can cause unwanted ghosting on subsequent sheets.

Because of the complexities inherent in LED printers, the horizontal resolution is fixed and the speed of the device is determined by the rate at which the diode array can flash during the printing process. A failed LED in the writing allows for no compromise and will be evident in the end print, requiring a maintenance visit for replacement.

## INK-JET BENEFITS

Conversely, using HP's scalable printheads and Double Swath Technology, there are fewer moving parts, a lower electrical requirement, and consequent higher reliability essential for unattended and remote printing. Because the engine which drives the ink to the media is contained within the printhead itself, this becomes a user-replaceable component which can be changed easily and quickly thus removing expensive and time consuming maintenance procedures. It is also important to note that a failed nozzle in the head can be addressed and corrected via the optical drop detector without compromising output quality, thereby eliminating waste prints.

HP's scalable printhead technology for high speed technical applications is noted for its reliability and the fact that every element required lies within the head itself. It is not reliant on a series of electrically charged processes in order to transfer ink onto the paper. There is a packing density of 1,200 nozzles/inch and precision drop directionality which maintains crisp, clear lines even at the highest throughput speeds.

Combined with the company's Double Swath Technology, the number of scans for an A1 landscape mode image is typically only 14, enabling a sheet of this size to be printed in 15.5 seconds. This also generates high levels of optical density, crucial for blacks, with the Designjet T7100 being optimised to enhance page processing and drying times with minimal delay between pages.

## CONCLUSION

In conclusion, the use of LEDs in technical wide-format printing has provided a method of generating high-speed output using a technique which is similar to laser production but at a lower cost, particularly in larger printing machines. Prior to the HP Designjet T7100 there has been no true ink-jet equivalent for this market sector that can provide fast, quality throughput with the added necessities of reliability, low running costs and ease of use.

By incorporating its established scalable print-head technology in conjunction with Double Swath Technology and Optical Media Advance Sensor, HP has brought a viable and attractive solution to the technical market. Fast, sustained printing performance is complemented by a clean, dust and ozone free solution which, over long-term use, should increase high quality production throughput, prove cost-effective and reduce maintenance and down-time. ■

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