

Is this digital printing's 'holy grail'?

Pat Reynolds, VP Editor Emeritus

Compelling as digital printing has become, many have waited on the sidelines until 'production speeds' could be reached. That day may be here where direct-to-shape printing is concerned.

Direct-to-shape (DTS) digital decoration of rigid containers may have reached a breakthrough moment with the development of the IDS 250 from Israel's **Velox** (www.velox-digital.com). This new digital technology—which was introduced as a commercially available decorating solution at LuxePack NY May 16-17—makes it possible for the first time to execute both high- and low-volume runs with near-zero set up time and superior quality at an affordable price.

Also identified at Luxe Pack NY was the first converter to operate the IDS 250 on a commercial basis: Israel's **Lageen Tubes** (www.lageentubes.com), which offers tailor-made packaging tube solutions in more than 30 countries around the world. Lageen supplies digitally decorated mono- and multi-layer plastic tubes for customers like Ahava Dead Sea Laboratories, Ltd., an Israeli cosmetics company that manufactures skin care products made of mud and mineral-based compounds from the Dead Sea.



Ahava's six-SKU project (two are shown here) was perfect for digital printing.

"Velox disrupts the conventional perception that mass production digital DTS is a technology that will only be available to us some day in the future," says Marian Cofler, Velox CEO, a printing industry leader who holds several digital printing patents. "Today, batches of any size, with a cost per copy that is competitive with

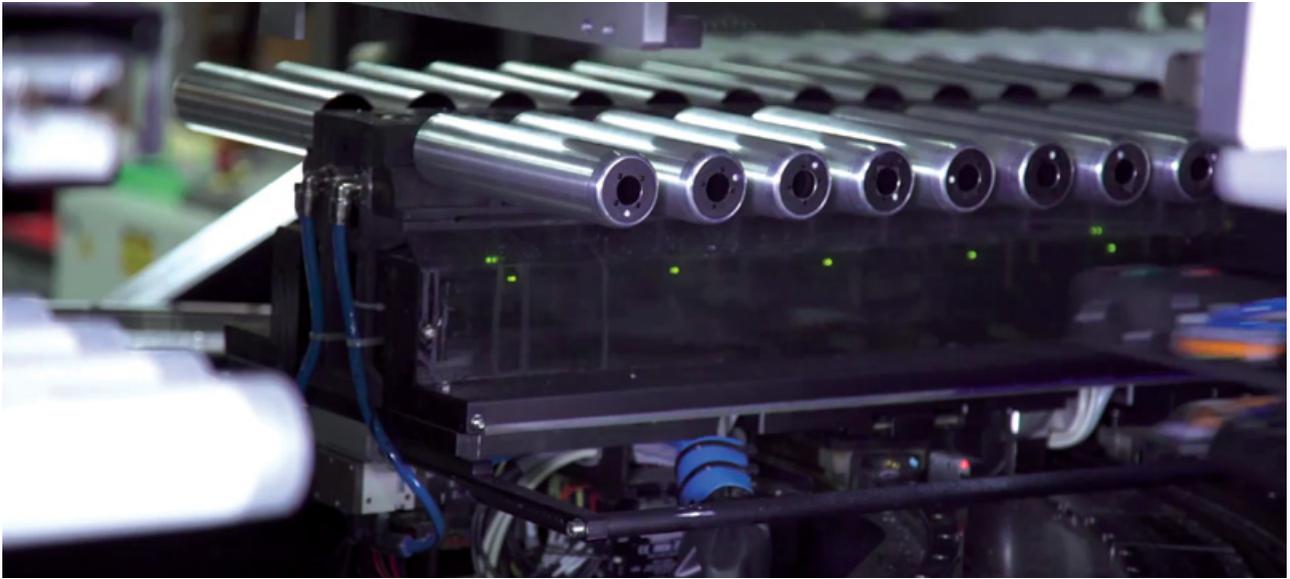


The Velox technology can turn the closure into an integral part of a tube's design. Printing can also be done on aerosol cans.

analog decoration for long runs, are possible. This is an enormous breakthrough that can profoundly shake the industry—printing digitally direct-to-shape of any volume is now revolutionizing how products are branded, produced, and marketed."

According to Ofer Nir, VP Marketing & Business Development at Velox, this technology is built on two pillars, both of which are trademarked. "The special ink we have developed is one pillar," says Nir. "Our Variable Viscosity Ink™ lets us print on nearly any surface, coated or uncoated. That's why we describe our technology as 'substrate agnostic.' And because it's characterized by variable viscosity, it permits us to have ink droplets behave differently in different areas of the artwork being printed. We can determine when only a small dot gain is appropriate or when the drop should be allowed to spread, thus achieving both high print quality and ink efficiency." Nir emphasizes, too, that this performance characteristic is a function of ink chemistry, not the multi-drop print head feature.

Nir also points out that, unlike some competitive direct-to-shape digital printing technologies, no pinning stations are needed to partially fix one color before the next is applied. Curing of all colors is done once, and it occurs a considerable distance away from where the print heads deposit ink. "This translates into a significant reduction in the occurrence of nozzle clogging,



enabling highly consistent and reliable printing quality,” says Nir.

The other pillar supporting the Velox technology is described as Adaptive Deposition Architecture™. It’s an entirely new architecture based on an elliptical track on which multiple carriers move containers through the decorating process. This independent-carriers-on-a-track technology is yet another example of the ongoing trend toward linear servo motors that is quietly transforming the packaging machinery business. In this particular case, the linear servo motor technology comes from [Tecnotion](http://www.tecnotion.com) (www.tecnotion.com). Each carrier is completely autonomous, so it can stop, start, accelerate, or decelerate independently of the others. “This enables us to achieve very high print head utilization, as well decouple the dependency between the different processes throughout the printing,” says Nir. “Another resulting benefit that also separates us from anything else out there is that this is not a four-color process. This is 15 colors plus enhancements simultaneously, and it involves many print heads.”

Each carrier that runs along the Tecnotion track holds multiple mandrels. These mandrels rotate so that all sides of each tube are exposed to the print heads, curing stations, and so on. An automated tube-handling system designed by Velox engineers handles the task of getting tubes onto the mandrels. The carriers then take the tubes through the entire decorating process: tube orientation, dust removal, surface treatment, printing, curing, camera inspection, and automated unloading of finished tubes.

Print heads from Ricoh

The IDS 250 relies on ink jet print heads from [Rico](http://www.ricoh-europe.com) (www.ricoh-europe.com). According to Nir, these high-quality print heads married to Velox’s unique Variable Viscosity ink and its Adaptive Deposition Architecture represent next-generation technology that minimizes clogged nozzles. Nir points out that choosing “off-the-shelf” print heads was done quite deliberately. “There are great print



Keys to the Velox digital decorator are special inks and a unique linear servo motor transport system whose carriers take the tubes through the decoration process. Top photo shows one such carrier just before tubes are automatically placed on its mandrels.

heads out there that continuously improve. We make sure our inks are always compatible to all major print head suppliers,” he says.

When it comes to actual containers per minute, Velox says that number is 250 tubes/min, even for large-size tubes, which is essentially what high-speed dry offset delivers and is considerably higher than what screen printing can do. But neither of those analog decorating technologies comes close to having the kind of operational agility that an industrial-hardened digital system has. Because with Velox there is no need to prepare the printing plates used in offset or the screens used in screen printing, the time required for set up is basically eliminated. All that’s required is for the operator to send a new electronic file. In a world where brand owners are relentlessly pushing converters to provide packaging in more SKUs and shorter and shorter runs, to provide it just in time, to cut costs wherever possible, and to make sure that there is no drop-off in quality, direct-to-shape digital is the answer, says Nir.

“An analog tube-decorating operation is down something like 45% of the time, and a significant portion of this is due to the analog decorator set up requirements,” says Nir. “With direct-to-shape digital, that number is slashed dramatically. As a result, production line efficiency increases and the total cost of ownership with direct-to-shape digital becomes extremely compelling.”

The enthusiasm about this disruptive decorating technology shown by Nir and Cofler is to be expected. But equally impressed,

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it would seem, is analyst Amy Machado, Research Manager Imaging, Printing, and Document Solutions at market research firm IDC (International Data Corp.). "With the IDS 250 system," says Machado, "Velox has been able to find the holy grail for digital print. Digital is often a complementary technology, but the IDS 250 can be a *replacement* technology for analog processes. Velox's Adaptive Deposition Architecture coupled with their proprietary inks achieve the productivity and speed that long production runs require, with the full on-demand benefits of digital without compromising on color or image quality."

"The first vertical industry we have chosen to focus on is cosmetics, which means tubes and aerosols," says Velox's Nir. "But we've had conversations with brand owners about PET, glass, and non-aerosol metal cans, too. We're taking digital printing into the domain of mass production. We're not saying use digital only for short runs. We're saying you can use it for your entire portfolio. It's not a complementary technology that operates alongside of analog. It replaces analog. The idea is not to have nine lines running high volumes with analog technology and one Velox line doing short runs but to use digital decoration for any job profile."

Replacement for analog?

Will this kind of wholesale replacement take place at Lageen Tubes, where the first IDS 250 is in operation? Lageen General Manager David Deluya says only time will tell. But in the meantime, he's plenty happy about what direct-to-shape digital permits him to provide his customers. "We now offer a completely new level of capability, both in terms of agility and responsiveness, on top of superior product appearance," he says. "Set up time with traditional technologies, once the artwork is done, is in the range of three to four hours. With Velox it's five or ten minutes. It's a completely different game. And on top of that, the speed at which we print is basically unchanged from what we do on our traditional decorating machines."

He likes the fact that with Velox technology there is no overlap like there is in analog technology where a printing plate is involved. He's even more excited about the 360-degree "end-to-end" printing he can do, where the cap becomes part of the graphic design.

"Historically the cap was treated as something completely separate from the tube," says Deloya. "Velox lets us include the cap as part of the surface on which we print. Customer response to this capability has been amazing. Moreover, the offering of using unlimited shades was embraced by our customers as it enables them to differentiate their products."

Ahava, Lageen's first customer to leverage the capabilities of the Velox IDS 250, chose to go with a six-SKU project that was perfect for digital printing. "They brought us six fantastic images done by six different painters, each representing some aspect of female empowerment from an international point of view," says Deluya. "To do six SKUs in a single production order was incredible." **PW**