Digital innovation in labels and flexible packaging continues to open new doors for brands looking to better engage with customers and drive stronger customer retention and brand loyalty. And, though it may seem impractical to ponder a label-free future, there is a strong focus on how direct-to-shape printing can add value to the packaging market.

Direct-to-shape printing is certainly not a new technology. However, the opportunities now available with inkjet — coupled with complementary advances in other components of direct-to-shape, and combined with the fact that the trend for personalized, specialty packaging shows no signs of slowing down — make for a potentially exciting future for digital direct-to-shape in packaging.

Xaar-owned Engineered Printing Solutions (EPS) is among the businesses designing and building custom, often proprietary, direct-to-shape systems that can be perfectly integrated into existing production lines. At PRINTING United 2019, EPS presented the MD-9450 cylindrical inkjet printer from French company Machines Dubuit through an exclusive partnership between OPM Europa and Memjet. Courtesy of OPM Europa.

The Future of Direct-to-Shape
How inkjet is opening up opportunities in packaging.

By Karis Copp, Industry Author
North American partnership. The show also saw Inkcups introduce its Revolution high-speed digital cylinder printer, while ink manufacturer Marabu North America debuted its first digital printer, the M Revo, designed for cylindrical objects. All three businesses focused on drinkware applications.

**Advantages in a Personalized World**

Where direct-to-shape inkjet really differentiates itself is in personalization and customization for promotional packaging with significantly reduced lead times, the elimination of minimum order requirements, and the flexibility to print-on-demand. The growth area here, and the area that has seen the most widespread adoption of direct-to-shape, is beverage containers. Although a label initiative, a good example is the “Share a Coke with … [insert name here]” Coca-Cola campaign, which really cemented consumer demand for customized experiences with brands.

Eventually, the novelty of the customized Coca-Cola bottles featuring more common names wore off, and the company made it possible to order a one-off, completely personalized bottle. Customization is no longer enough — if brands want to bring consumers into their ecosystems and retain them, they need hyper-personalized end-to-end experiences. This trending preference for products that are special and “just for me” shows no signs of dissipating; if anything, it has become more prevalent and even expected by consumers, particularly the younger demographic who largely prefer personal and experiential brand interactions.

Ken Tyler, Sales Engineer at Engineered Printing Solutions, envisions direct-to-shape playing a significant role in this brave new “me, me, me” world. “Take this example: you’ve just had a baby, and you’re ordering wet wipes. You have a profile saved on Amazon, and your order is going to get processed. Perhaps you opt to have your baby’s name right there on the lid; the details are there on ‘My Subscription,’” he says. “Maybe there are Disney characters, or princesses printed on there too — who knows! The point is, it could be completely customizable. Every single lid going through the printer can have its own image just based on variable data tracking.”

**Challenges and Considerations**

While there are many opportunities for direct-to-shape based on packaging trends, there are of course challenges in the space as well. Digital direct-to-shape is unique because there is no “one-size-fits-all” solution. When printing directly to 3D objects, irregular surfaces, and atypical substrates, there is a lot to consider — from pre-treatments to ink chemistry to substrate handling — therefore, a flexible, adaptable solution is paramount.

According to Craig Reid, founder and president of digital print consultancy CTR Resources, all the components for a cost-effective inkjet solution are there, but a lack of systems integrators with the ability to custom build direct-to-shape solutions, dependent on individual needs, means adoption of the technology is lagging.

“The individual elements, such as the printheads and drive electronics, ink delivery systems, pretreatment, inks, coatings, and substrate handling systems are certainly ready,” he says. “The issue with systems integrators is often who pays for the engineering and development cost as the system solution is being made ready for production. The more custom the direct-to-shape application, the more this is a factor.”

Tyler echoes this sentiment, adding, “Frankly, there is a lack of collaboration among ink manufacturers and machine manufacturers. Everybody always points to the rapid uptake of digital in the ceramic tile space, and it was largely because the manufacturers worked with the substrate companies to achieve various technical standards of adhesion and so forth. That is one of the big challenges in direct-to-shape.”

When it comes to who is investing in direct-to-shape, it is interesting to see brands taking matters into their own hands by taking package printing in-house. Despite a purported dearth of systems integrators, there is development of bespoke solutions custom-made to a client’s requirements. It’s easy to see the appeal, since it allows them to manage their own lead times; calculate costs per unit; utilize variable data to create custom,
high-end packaging on-demand; and react to packaging trends by amending and adapting designs at the drop of a hat. Not to mention, they can quickly and easily customize packaging for special promotions, seasonal changes, region-specific packs (including the use of different languages), or event collaborations. The freedom to make such smooth transitions can be game-changing.

A Label Technology Replacement?
Many experts regard direct-to-shape inkjet for the packaging market as in its infancy with significant growth potential. But if brands are eschewing converters and opting to invest in the technology themselves, it seems this would be disruptive for label and packaging printing. Dursun Acun, Founder of OPM Europa, thinks so.

Acun developed a robotic technology to integrate into label production, partnering with Memjet to combine its VersaPass technology with his system, ultimately creating a direct-to-shape label printer called LabelSaver. “It is extremely disruptive,” he says. “We’re looking at the developments in the markets, and the first thing customers are looking for is flexibility.

“Not having to apply a label, and printing directly on the product itself provides so many logistical advantages; it can be more expensive, but the logistics advantages are so big, we have customers waiting until we are ready to have these machines installed in their factories. If I’m right, and I think I’m right, why would businesses want to apply labels if the advantages and the savings are so huge? We want to sell this machine to the end user and not to the label converters because the machine can be installed in line, so you can print any kind of design on any kind of bottle. You can actually produce on-demand so you don’t have to wait two weeks for your labels.”

As for whether direct-to-shape inkjet will serve as a replacement technology for labels, there are many instances in which it will serve as a superior option, as previously noted, but it won’t happen overnight. “I feel like we are still at the beginning of direct-to-shape. As with anything at the beginning, it takes some time before knowledge and awareness of the technology and applications grow,” Reid says.

For Tyler, the businesses he’s seen moving from analog to digital show that the future of digital inkjet in general looks bright. “People are moving from analog, offset, screen printing, into digital, and that by itself points to a very strong future ahead,” he says. “The big industry with

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regards to digital direct-to-shape is definitely beverage. Think about craft brewers: Today you walk into a gas station and there are a number of different local beers, all of them printed with labels. When we get speeds up and costs down on direct-to-shape, labels on that type of market will go away.”

Acun predicts that as direct-to-shape inkjet evolves, skepticism will subside. “Conservative graphics companies were cynical about the Indigo technology initially, but eventually the industry saw the flexibility of printing digitally, and realized it was the future,” he says. “I think our technology will experience similar rejection, but before long, people will see that it is flexible, disruptive, and the best choice.”

While adoption of digital direct-to-shape in the packaging market is not yet widespread, an intelligence report from Future Market Insights forecasts almost 6% year-over-year revenue growth for the direct-to-shape inkjet market, with food and beverage leading the pack. Further maturation needs to take place, but the opportunities to meet consumers’ ever-growing demands for completely personalized experiences with products that feel luxurious and tailor-made continue apace.

Undoubtedly, more collaboration is required for this unique area of print to drive increased investment and trust, as well as further development in robotics and printheads that can overcome curvature challenges. And as speeds accelerate and maintenance costs diminish, the industry will likely witness broader adoption. Ultimately, consumer packaging trends will continue to be the impetus for direct-to-shape demand, and while it’s unlikely to be a match for mainstream production label printing, it has its niche in personalization and customization. As the printing industry moves into a new decade, it is certainly worth keeping an eye on how this segment shapes up.

Reference


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