Driving digital printing opportunities

According to Yariv Ninyo, Oliver Heitmann and Shirley Segev, automotive glass processors should not be looking to abandon screen printing. Instead, now is the time to add digital printing to create a more flexible and value-added offering.

Digital printing for the glass industry has gained significant traction over the last few years. As the technology has advanced, awareness and demand have grown apace. That said, overwhelming attention has been cast on architectural and decorative glass – building facades, curtain walls, banisters, shower walls, kitchen backsplashes, even art pieces. For such applications, the advantages that come hand-in-hand with digital, such as cost-effectiveness, multi-colour and one-of-a-kind printing, are easy to recognise.

But what about automotive glass? Does digital glass printing also hold value for cars, buses, trains, boats and aircraft? After all, for automotive glass, the considerations are typically less about creative freedom and more about print quality, ink standards, precision, speed and return on investment. The answer is increasingly a resounding "yes". Digital printing, now more than ever, is a perfectly suited medium for the exacting demands of the automotive industry.

Until just a few years ago, automotive glass was all about screen printing. With high print quality, durable inks and low cost-per-piece over long production runs, screen printing offered (and continues to offer) a robust answer for automotive glass. Nevertheless, there is always room for improvement. And so, some forward-thinkers started looking at applying the emerging digital printing technologies to automotive and special transportation glass. And with good reason.

Simplified workflow, increased customisation, exceptional accuracy

Even with the strengths of screen printing, there is no denying that digital printing offers significant workflow advantages. Graphics for frames, logos, fine details and patterns are designed in digital format and processed with RIP software. They are then converted to printing models and jetted onto flat glass surfaces using drop-on-demand printing technology. Because digital print is file-based, there is less hardware involved, minimum machine setup, reduced labour costs and a simplified production line. The absence of screens eliminates the need for post-print cleaning and for storage.

These kinds of advantages open opportunities in varied automotive and specialty transportation segments. For example, a company that serves the recreational vehicle, marine and bus industries can particularly benefit from the high speed and accuracy, enhanced dot matrix printing capabilities, printing tempering stamp and date code parts offered by digital printing. For such companies, it would make good business sense to fully replace screen printing with digital printing and for others, it might make sense to offer both.

For example, Oran Safety Glass, a large Israeli glass processor, has found that digital technology is better suited for the quick setup and flexibility required to meet the needs of the automotive after-market sector, while significantly reducing labour. As the company's VP and CFO David Yogev notes: "With our digital printer, one operator can control the entire operation of the machine, setting up the windscreen, the printing process with a computer and basically, the machine then operates itself until the glass comes out the other end of the dryer".

Dip-Tech Nera V is the first digital glass printer designed for the demands of the automotive industry.

In the case of companies whose customers typically need single digital quantities, digital is the only way to go. Traditional screen printing is not flexible enough and setup pushes the per piece cost needlessly high. Digital printer setup is significantly quicker and more flexible, enabling overall faster production of small orders, thus allowing far more glass to be printed each day.

Because it is file-based, digital printing easily accommodates customisation and variable data printing – for branding options such as logos, serial numbers and text – as demanded by the automotive industry. Every single piece of glass can be printed with a different serial number in a single run, with no additional setup. Additionally, digital printing is capable of printing multiple jobs – of different shapes and sizes – at the same time, on the same machine, in one go.

The customisation advantage is felt strongly by companies like Trend Marine in the UK. It has been using its digital printer for over a decade, printing varying glass sizes (from 0.5m up to 2.5m) and shapes for its yacht building customers, with frit designs applied to the border of the glass that can be changed quickly, easily and cheaply.

Digital printing also allows for the immediate creation of a prototype, with minimal investment. Furthermore, variable information lends itself to product traceability.

As for quality, by its very nature, digital printing is able to deliver exceptional accuracy, including edge-to-edge printing, precise registration (particularly pertinent for two-sided printing), high resolution (down to the smallest fonts and ultra-fine details) and proven durability.

Until recently, digital printing solutions for the automotive industry were essentially adaptations of the printers used for architectural and interior design applications. But now, automotive glass processers can work with a digital ceramic glass print developed specifically for the automotive industry. Dip-Tech Nera V is the first digital glass printer designed for the special demands of the automotive industry. It integrates technology from screen printing solutions, including an inline automatic indexing system that is able to automatically index and register non-systematic glass shapes, with no manual operation required.

The digital ink advantage

While digital glass printing systems use various types of inks, only inks based on ceramic frit can meet the durability requirements of automotive glass. Digital ceramic inks developed especially for the automotive market have high optical density and opaqueness, are chemical-resistant and give full control over wet layer thickness, making them well-suited for multiple industrial applications.

Automotive black ink was designed specifically for the automotive industry treatment process (including sag/mould bending and tempering) and provides UV resistance for automotive applications. Anti-stick black ink, on ▸

the other hand, was created explicitly for automotive glass bending furnaces and is ideal for large glass panels, sharp angles and furnaces that use moulding. These digital inks, just like the numerous black inks for screen printing available from Ferro, successfully meet the technical and aesthetic requirements mandated by the automotive market.

More cost-effective than ever

Digital glass print has long been a smart choice for short runs and is increasingly being selected for medium runs. This is especially true in the automotive industry, where there is a strong emphasis on strict criteria for safety, with an inherent need for flexibility and customisation. Today, adding digital printing capacity is more than recommended; it is becoming an essential competitive tool, answering a strong market demand.

With the advent of powerful new technology – such as machines that can print fully opaque automotive frames at up to 300m²/h, enabling a windscreen to be printed in less than 40 seconds and single colour fine details and logos at 120m²/h – digital printing has an attractive payoff.

Until recently, digital was most economical for single orders or those in the tens. Now, it is proving a cost-effective alternative to screen printing for batches into the hundreds. And with the resulting ability to move more work to digital, glass processors can better utilise their existing screen lines for very large batches, better distributing work, for a more profitable and productive production floor.

The inherent flexibility and increasingly higher productivity of digital glass printing are valuable not only for automotive replacement glass but also for varied specialty transportation applications. These include agriculture and construction vehicles, bulletproof and protective vehicles, marine glazing, RVs and motor homes, railways and buses.

The best of two worlds

Digital glass printing is a great niche market, with tremendous potential for automotive glass producers and glaziers of any size, particularly in the auto glass replacement segment. While smaller companies can enjoy the inherent added value of flexibility, larger glass processors can equally benefit from freeing up screen capacity for more massive orders. This in turn makes digital glass printing more competitive, more productive and more profitable.

Together with Ferro's proven technology and experience in providing black obscuration glass enamels and silver pastes, the combined forces of Ferro and Dip-Tech are well positioned to drive the opportunities that digital printing offers for the automotive glass market.

Thus, the choice between screen printing and digital printing is not a zero-sum game. Both offer excellent quality. Each has its benefits and there is room for both, even within the same production floor. Screen printing has many advantages, particularly for the massive runs required by auto brand manufacturers, while digital printing offers a robust additional technology for more flexibility and responsiveness. I

About the authors:
Yariv Ninyo is Head of Business Development, Dip-Tech, a Ferro company; Oliver Heitmann is European Business Manager Automotive and Electronics, Ferro; and Shirley Segev is Marketing Manager, Dip-Tech, a Ferro company

Further information:
Dip-Tech, a Ferro company,
Kfar Saba, Israel
tel: +7908404 9 972
email: info@dip-tech.com
web: www.dip-tech.com

Ferro GmbH,
Frankfurt, Germany
tel: +6503 2711 69 49
email: info-pcg@ferro.com
web: www.ferro.com