

How sustainable is flexo plate production?

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In view of global challenges in energy markets and ongoing climate change, the eco-friendly production of flexo printing plates is gaining increasing attention. Therefore, it is time to examine common manufacturing processes in terms of their energy and resource consumption as well as their overall efficiency.

An overview of the European market shows that the production of photopolymer solvent-washable flexo plates is widespread. In this process, photoinitiators in the photopolymer are activated by UV-A light, generating radicals that crosslink the monomers and shape the printing relief. The non-crosslinked compo-

nents are washed out with a solvent mixture, which then needs to be distilled at high energy costs to be reused. This process is not only energy-intensive but also environmentally and occupationally hazardous, as solvent losses must be regularly compensated with fresh solvent.

A typical photopolymer produc-

tion line includes equipment such as laser and exposure units, washers, dryers, and a solvent distillation unit - all of which require significant amounts of energy. Overall, this process is complex, energy-intensive, and costly.

Advantages of direct laser engraving

A promising alternative to conventional production is direct laser engraving of elastomer flexo plates. Such systems have space requirements of less than 50 m². Besides the laser, which only requires electricity, only a washing system is needed to remove engraving dust with water and soap. Alternatively, cleaning can be done manually using regular tap water or treated rainwater.

The digital imaging process minimizes errors and ensures high availability of the flexo printing plate. Within an hour, a plate is fully imaged and ready for use. A key advantage is that the entire process operates without solvents. The on-

The PremiumSetter by Hell Gravure Systems can be configured as a hybrid direct laser engraving system, enabling the production of elastomer flexo printing plates and sleeves with a single device.



Source: Hell Gravure Systems

In-house production: Two steps to press-ready plates

The Heliograph Holding, consisting of Kaspar Graphic Solutions, Hell Gravure Systems, and Glunz & Jensen, presents an in-house solution for the fast and efficient production of elastomer flexo printing plates directly at the printing press. With a streamlined, optimized process comprising only two to three steps, print shops can produce their flexo plates in less than an hour:

1. Cutting the roll plate material:

Kaspar Graphic Solutions supplies roll material. It is cut to the desired format size or is pre-configured and ready-to-use by the supplier.

2. Direct laser engraving:

The "PremiumSetter" from Hell Gravure Systems engraves the three-dimensional print relief in a single step. The operation is simple and can be handled by non-experts after just brief training. In times of skilled labor shortages, this aspect is becoming increasingly important. Additionally, the PremiumSetter can be configured as a hybrid

direct laser engraving system, allowing both printing plates and sleeves to be produced with a single device.

3. Plate cleaning:

The engraved plates are thoroughly cleaned using a system provided by Glunz & Jensen. This entire process enables flexible, on-demand plate production directly at the printing press, saving valuable time.

Six elastomer flexo plates to choose from

Founded in Chicago in 1977, Kaspar Graphic Solutions is headquartered in Inman, South Carolina. Under the Kareldirect brand, the company manufactures six different elastomer flexo printing plates for direct laser engraving in Greeneville, Tennessee. These plates are designed for a wide range of applications, including dry offset, corrugated board, varnish finishing, flexible packaging, and security printing. The extensive portfolio of products and services for the package printing industry is distributed

worldwide through the Heliograph Holding network.

Versatile advantages of the process

The elastomer flexo plate production process offers numerous benefits:

- **Efficient, solvent-free process:**

The two-step production (engraving and cleaning) saves resources and is environmentally friendly.

- **Outstanding print quality:**

HD resolution and enhanced colour transfer thanks to micro-structuring of the plate surface deliver excellent print results.

- **Time-saving handling:**

Short setup times and stable reproduction of highlight tones using undercut technology.

- **Wide range of applications:**

A variety of customized EPDM compounds with high mechanical and chemical resistance are available.

ly waste product is engraving dust, which can be easily disposed of as residual waste.

Durability and reusability

Beside substantial energy savings, direct engraving offers additional environmentally friendly benefits. Users report significantly longer durability of elastomer flexo printing plates compared to photopolymer plates, especially when used on rough substrates.

Elastomer flexo plates can also be reused by removing the printing relief and recycling the material. The regrind can be used as base coating material for new printing sleeves. Elastomer flexo sleeves can be re-coated up to five times, offering both ecological and economic advantages. Additionally, fiberglass carriers of elastomer sleeves can be reused if undamaged.

The quick availability of printing plates significantly reduces machine downtime and setup times. This enables flexo print shops to produce on demand and avoid unnecessary job changes.

Ease of use and digital process

The manufacturing a photopolymer flexo plates requires up to seven partly analogue process steps. This means printers need to invest in exposure units, washers, lasers, dryers/finishers, and possibly laminators and distillation units to establish in-house production.

"Kaspar Graphic Solutions produces six different elastomer flexographic printing plates for direct laser engraving."

This results in extensive labour and space requirements and therefore is a cost-intensive process. If endless print motifs are required, additional equipment for sleeve production would also be necessary. A fully digital alternative is direct laser engraving. A flexo plate or sleeve can be engraved in a single step using just one machine. In this process, a high-energy laser generates the three-dimensional relief in just one pass. Operating the laser is straightfor-

ward and, after brief training, can be handled even by non-experts. Direct engraving systems can also be configured as hybrid machines, allowing the production of both plates and sleeves with a single laser system.

On-demand production

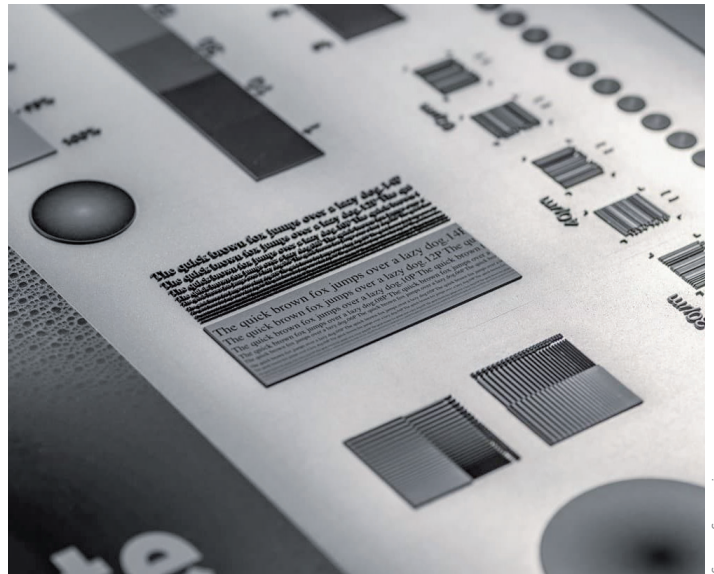
Already, print quality has reached an extremely high level for both photopolymer and elastomer printing plates, making it less of a deciding factor in plate selection. Today, direct lasers can engrave up to 1 m² of plates per hour at a high resolution of 5080 dpi with a screen ruling of up to 80 L/cm. With two-shift operation, capacity demands of about 4000 m² per year can be met. The primary advantage of photopolymer plates is their throughput per hour, which is significantly higher than with direct laser engraving. For service providers, the necessity to produce a large number of square meters for profitability is a given. However, for printing companies, the productivity of a direct laser engraving system is usually sufficient for

the on-demand production of flexo plates and sleeves.

Optimum integration into print shops for maximum efficiency

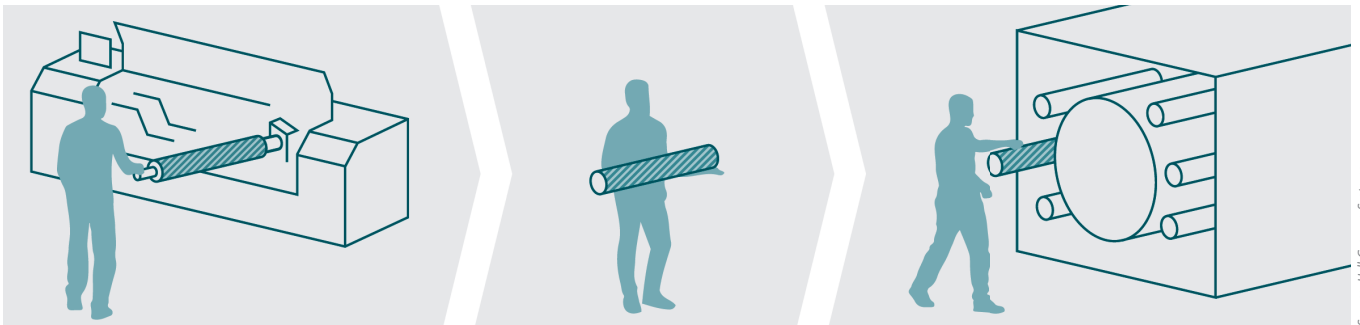
Systems for direct engraving of elastomer plate materials require minimal space and consist of a limited number of components. After laser engraving, the printing plate only needs to be cleaned, which can be done manually or using fully automated washing systems. Such a setup can be installed within just a few days. From a hardware perspective, print shops could easily produce their own plates at the push of a button. The question remains as how printing

“Plate on demand” means relocating the imaging of the flexo printing plate to the respective print shop. A major advantage for all process participants is the fast availability of the printing plates and sleeves at the press.

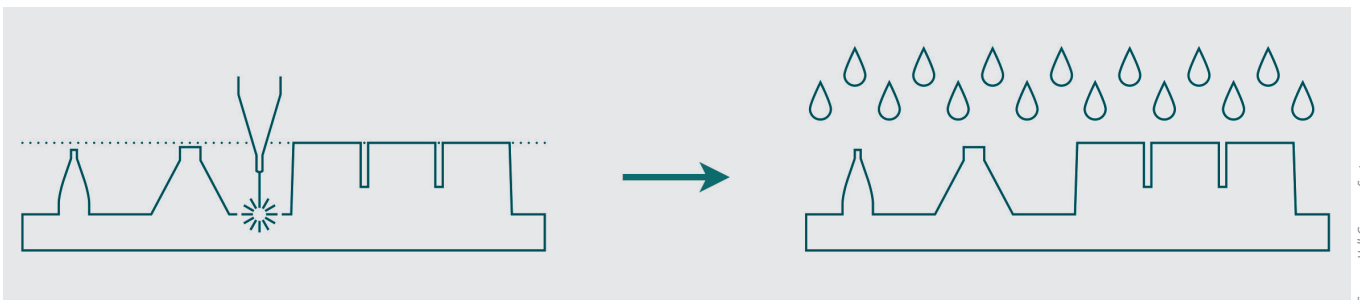


The direct-laser engraved elastomer layer of a flexo printing sleeve.

Source: SauerStig



Source: Hell Gravure Systems



Source: Hell Gravure Systems

The direct laser engraving of elastomer flexo printing plates and sleeves takes place in a single step. After subsequent cleaning, the plates or sleeves are immediately ready for printing.

data should be prepared. If no pre-press department is available in the respective print shop, a viable solution may be to outsource data preparation to traditional prepress service providers while shifting only the direct plate engraving process in-house. The laser can be supplied with engraving data via a cloud-based interface.

“Plate on demand” means shifting the imaging of flexo plates to the print shop. A significant advantage for all parties involved is the rapid availability of the plates at the press.

Once the design is approved, the printer can generate the required

“Direct laser engraving allows flexible, customised production of elastomer printing plates or sleeves directly on the flexographic printing machine.”

plates for immediate use. This eliminates the need for transportation from the prepress house to the print shop, reducing costs and environmental impact.

Damaged flexo plates often result in production delays since acquiring replacement plates can be time-consuming. With an in-house direct laser engraving system, printers can quickly produce

replacement plates without interrupting the job.

Conclusion

Direct laser engraving represents an environmentally friendly and forward-thinking alternative to conventional photopolymer flexo plate manufacturing. Sustainability and rapid availability are key factors that must not be overlooked in plate production. In the near future, plate manufacturers, print shops and brand owners will increasingly focus on sustainable and efficient manufacturing technologies such as direct laser engraving. ■