

Advertising space on corrugated cardboard

Packaging printing: Corrugated cardboard packaging has evolved into a marketing instrument, so the print quality must be correspondingly high. The Bavarian company Göpfert uses flexible motion control technology to ensure highly accurate direct printing onto corrugated cardboard.



Göpfert Maschinen GmbH

High-quality printed corrugated cardboard packaging places ever-higher demands on printing machines

The image of corrugated cardboard printing used to be defined by banana crates, pizza boxes, and moving cartons, all featuring relatively simple motifs. But it is now possible to print directly onto corrugated cardboard in preprint quality, meaning it has become an attractive option for the packaging of high-quality electrical devices and other large consumer goods and for use in retail sales displays. The print-quality demands are correspondingly high. At the same time, ever-shorter product innovation cycles and a high diversity of variants lead to smaller batch sizes, which in turn lead to frequent production

changes and machine adjustments. This means print machine manufacturers must continuously improve not only their systems' quality but also their flexibility and productivity. One of the market and technology leaders in the production of printing machines for corrugated cardboard is Göpfert Maschinen GmbH from Wiesentheid near Würzburg. The family business supplies prestigious companies in more than 50 countries, showing a constant commitment to quality "Made in Germany." The same also applies to Göpfert's drive technology and motion control, which for many years have been supplied exclusively by Siemens.

More efficient and flexible with direct drive technology

The Bavarian machine manufacturer was one of the first to abandon the drive wheel train in favor of individual electronic drives synchronized using high-performance motion controllers. State-of-the-art Simotion D motion controllers on the feeder, on each of up to 10 printing units, and on the rotating stamp are cross-linked via Profinet IRT. These controllers are driven by servomotors from the Simotics portfolio and are powered by the similarly modular and therefore precisely scalable Sinamics S120 converter system. For higher-level

sequence control, Göpfert uses a Simatic S7 with a robust Simatic IPC427D industrial PC and failsafe, real-time-capable Simatic WinAC RTX-F PLC software.

This distributed drive design provides a range of benefits for machine operators: shorter changeover and retooling times thanks to the machines' simpler mechanical construction, greater serviceability thanks to anilox rollers driven directly via the machines' own servomotors, printing and counter-pressing cylinders on each printing unit, and noticeably improved synchronization and significantly higher control accuracy. Even greater freedom is achieved thanks to the direct drive technology of high board lines, such as Göpfert's Ovation Line, which differ from conventional approaches in that the board moves above head height. This means, for example, that free stations on machines with eight or more printing units can be retooled and completely prepared for the next task while production is in progress. This keeps downtime short and productivity high. Another advantage of the modular design with Simotion: the drive configuration of every printing unit can be prepared and optimized in the office and then exported to the machine by simply inserting the memory card into the motion control unit. Because the memory cards can be easily duplicated, engineering, commissioning, and device exchange times are significantly shorter.

Using seamless automation technology

Göpfert takes full advantage of the capabilities of Simotion and Sinamics. The machine manufacturer has worked closely with Siemens to develop several functions, built on the Simotion Print Standard library, that are of crucial importance for flexible, high-quality corrugated cardboard printing. Examples include the feeder function with electric cam disks, which enables corrugated cardboard sheets to be drawn from the stack quickly but gently and fed precisely into the printer, and APM print-length correction, which balances tolerances in the print length of individual plates. These special functions operating in

With a modular motion control system, Göpfert achieves consistently high print quality with maximum flexibility



perfect unison enable outputs from 11,000 to 20,000 sheets per hour at speeds of up to 300 m/min. Each process – from set-up to normal operation to maintenance – is simple and intuitive to control.

The safety functions implemented in the Sinamics S120 drive system ensure maximum safety during both set-up and operation. In particular, Göpfert uses the Safely Limited Speed function to safely limit the maximum permissible speed, as well as the Safe Speed Monitor, which signals if a drive is working below a specified speed – the speed at which a safety door can open or is allowed to be opened, for example.

Progress through innovation

To strengthen its technological expertise, Göpfert is looking to continue working on new and innovative solutions with Siemens. A current area of focus, for example, is the use of Simotics T torque motors as direct drives for printing units, making them even stiffer and more dynamic, meaning that, among other things, print-length correction can be further improved and waste further reduced. ■

➤ siemens.com/printing
✉ joerg.reh@siemens.com