Stop the Presses!

Servo-Driven, Shaftless Flexography Streamlines

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the Printing Industry

Today's newspaper advertisers demand vibrant, attractive color printing, and newspaper printers are constantly looking for methods to improve printing processes to meet these demands. When it comes to improving the printing process, the key component is to choose the right printing press. In order for a newspaper to successfully print appealing color ads, the chosen press must provide accurate color registration quickly and reliably, with minimal paper waste and reliable performance.

With this in mind, printing press designers are creating new flexographic presses featuring state-of-the-art, shaftless technology. Using drive and control components such as servo drives, Power PC (PPC) controllers, Synax systems and servomotors provided by Bosch Rexroth's Electric Drives and Controls Technology Group, press manufacturers are designing flexographic presses that meet printers' needs for efficient, simplified designs.

Flex-Ability

How does a flexographic printing press differ from a conventional printing press? Flexography, or "flexo," is the application of ink to a raised image on a rubber plate, which in turn transfers the ink directly onto a substrate. While the "flexo" process is traditionally used to print flexible bags, wrappers, cardboard and similar forms of packaging due to its clean print and vibrant colors, flexography is becoming increasingly popular for newspaper printing—a shift prompted by a combination of rising paper and labor costs.

A flexographic printing press offers advantages over a conventional one. Flexographic presses produce almost no waste during setup, due in part to all-digital control and the manner in which the ink is transferred directly from the anilox roller onto the plate. Color registration adjustments can be made at almost a crawl, eliminating a lot of startup paper and reducing paper consumption in some instances by as much as 15%.

A shaftless flexographic press performs without the mechanical driveshaft problems and associated wear that can cause color registration to suffer. This technology fixes the fundamental flaws of the traditional mechanical drive train—gear transmission error and windup—and it also provides flexibility. Less waste during setup and registration translates into faster, more efficient print runs as well as significant cost savings in paper and labor.

For example, one shaftless flexographic press design is so compact that it allows a four-high stacked color tower to stand just over 12' tall, and the press is rated for 50,000 sheets per hour and has the capacity to handle a 36" web.

The shaftless aspects of a flexographic press are commonly implemented, for example, by Rexroth digital servo drives and synchronous motors, which allow for circumferential image adjustment on the fly. Each plate cylinder's servomotor and drive pair retains its timed position in relation to the other plate cylinders' servomotors and drives through a process called electronic line shafting (ELS). ELS allows the operator to set up and prepare the press for a run before an inch of paper is ever pulled into the folder. This instant registration allows for low waste figures, faster startup times and less overall downtime.

With a servomotor and drive dedicated to each individual roller, the inertia and the rolling friction associated with conventional gearing are eliminated. This reduces the amount of power needed to move the roller, which maximizes electrical efficiency while keeping motor sizes manageable. It also allows for easier cylinder rolling. Even when the power is off, the cylinder can be rolled by hand with no resistance. The reduction in mechanical parts also reduces the maintenance of the press, as fewer parts wear and there are fewer parts to inventory.

For example, within a flexographic press, each roller can

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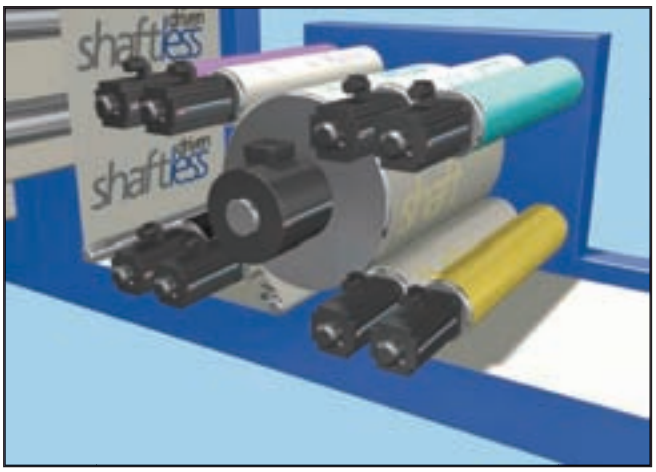

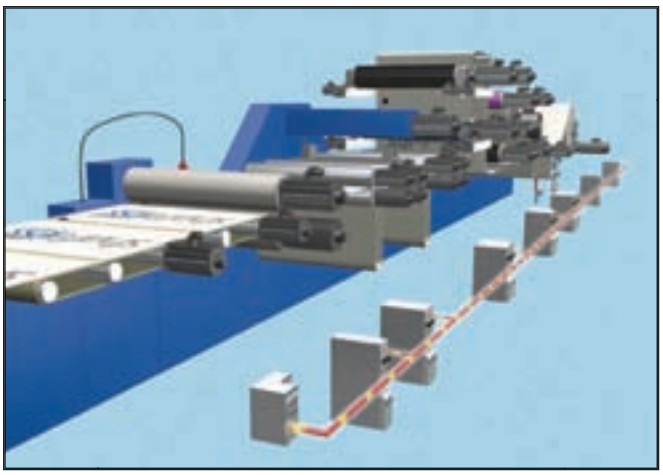

employ a high-speed AC servomotor, which moves each roller via a direct drive. Each servomotor provides precise control to within 0.0002", while moving at surface speeds of 1,560' per minute. Meanwhile, each servo drive can be networked together via fiber optic cabling, which enables tight synchronization between the drives.

Independent servomotors also allow simultaneous job setup procedures. Previously, mechanical drive systems prevented printers from performing make-ready if any part of the machine required maintenance. When a drive shaft connects the entire machine, it is a safety hazard to perform setup and maintenance at the same time, as each mechanical component's motion depends upon the simultaneous motion of all other mechanical components. On the other hand, with independent drives and controls, press operators can rotate any part of the machine while maintenance is being performed on a different part.

This same independent control allows for simultaneous setup of all machine modules. Because there is no mechanical link, each print deck and machine module can be set up simultaneously. Compare this to the sequential process of setting up one module at a time on a mechanically driven press, and the reduction in make-ready time is evident. After setup, the servo-driven flexographic press automatically re-times itself. Precise timing is achieved with servomotors that provide positioning accuracy to 16 million increments per motor revolution.

From a control standpoint, a Rexroth PPC can act as a "virtual master," controlling the location of each roller throughout the entire press. Once a print run is initially set up and all units are properly registered to one another for color printing, this configuration can be saved in a computer for future runs. Once saved, the configuration can be downloaded to the drives, where it is indexed to the proper reference points to begin the job.

In addition, since servomotors replace the drive shafts, the amount of rolling mass and friction in the press is greatly reduced. This allows the press to be run at a higher speed without compromising performance. The servomotors are optimized for the desired speed and the rollers they are driving for maximum efficiency. The optimization allows for a significant reduction in power consumption.

The Bottom Line

Every newspaper publisher has the same goal: to provide the vibrant colors and print quality that advertisers desire with the speed and efficiency demanded by the nature of the newspaper business. As a result, advances in flexography, like the application of shaftless servo technology, are increasingly making this process a more viable printing option. By reducing labor, paper waste, and electricity, a flexographic press supplies overall production efficiency, while maintaining the color printing quality that increases newspaper revenues.

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