Weyerhaeuser's Flexo Printing Facilities Streamline Prepress by Switching to New High-Tech Plate Mounting

by Jim McMahon, Zebra Communications

Challenged with shorter lead times, smaller order quantity, and tighter registration, forest products giant, Weyerhaeuser, increased prepress production by 100 percent, cut downtime between runs, reduced prepress waste, and improved safety with the new digital Vision Plate Mounter/Proofer system from Leader Engineering.

Historically, flexographic printing (flexo) has long been considered a low-quality printing system, but a mainstay for the printing of packaging containers such as corrugated boxes and flexible packaging like food bags, shopping bags, and self-adhesive labels. Over the past decade, technical developments in the flexo printing process have greatly improved print quality—i.e., enhancing the ability to reproduce highlight tonal values - working around the high dot gain associated with flexo printing, and by making accessible four-plus-color applications. But, the systems for the mounting and calibration of flexographic plates onto printing cylinders have not evolved as rapidly, that is substantially enough to provide for quick and highly accurate mounting of the flexible printing plates.

Plate Mounting Bottleneck

The quality of a flexo printing job depends, to a large degree, on the care in which prepress preparations are carried out. This includes mounting the flexible plate on the printing cylinder, checking color registration, and proofing. The mounting of the printing plates onto printing cylinders requires a high degree of alignment accuracy. The image on the printing plate must be perfectly square and in register with the printing cylinder in order to print clearly. The arrangement of the printing plates in the exact predetermined relationship with one another requires that their position be accurately determined prior to mounting.

After the plates are mounted onto the cylinders, the press operator must stop the press to examine the print results for acceptability. If out of registration, the operator must remove the plates from the cylinders and start over from the beginning. This activity is time consuming, resulting in substantial press downtime.

A common method to mount and align printing plates on the printing cylinder involves the drawing of a line around the printing cylinder. This line is then aligned by eye with a longitudinal line along the length of the photopolymer or other printing plate. The plate is then wrapped around the cylinder. This method is somewhat accurate, but can be extremely time consuming for the operator, leading to delays between print runs.

Other plate mounting and calibration systems have been devised for flexo printing using manual or semi-manual systems, such as employing rods for rolling the plate onto the cylinder, light projection to position the plates, plate vacuum suction devices, and registration pins and holes to align the plates on the cylinder. Each of these methods has proven to be error prone in registration.

Recently, a new high-tech, fully automated digital system of plate mounting and proofing has become available for use on flexographic printing equipment. It delivers quick and precisely accurate mounting for both horizontal and vertical alignment, accommodates a variety of different sizes of printing plates and cylinders, and is also easy to operate. The system appears to provide a solution to the long-standing calibration and press downtime problems associated with flexo plate mounting and proofing.

Called the "Vision Plate Mounter/Proofer®," and manufactured by Leader Engineering-Fabrication, Inc. (www.flexomounting.com), over the past five years it has been tested and selected by Weyerhaeuser Company as the plate mounter/proofer system of choice being used within several of its U.S. flexo printing facilities.

Weyerhaeuser

Weyerhaeuser Company, an international forest products company with annual sales of $21.9 billion, is one of the largest pulp and paper companies in the world, and the world's largest private timberland. The company was founded in 1900, currently employs about 41,000 people in 18 countries, and has ranked in the Fortune 200 since 1956.

Weyerhaeuser's Containerboard Packaging and Recycling segment, one of the company's five operating divisions, produces paper, boxes, and bags to move products from manufacturers to millions of households. The segment collects and recycles wastepaper, boxes and newsprint to make new products, it also provides a full spectrum of point-of-purchase design, production, packaging, and fulfillment services, including some of the world's most technologically sophisticated flexographic printing centers.

"We were looking for increased throughput and improved quality in our mounting area because of the constraints that mounting was having on our printing presses," says Harry Matthews, Superintendent of the Weyerhaeuser preprint plant in Tucker, Georgia. "We are challenged with shorter lead times, smaller order quantities, and tighter registration, and we felt that the Leader Vision system could address all of these issues at the same time. We purchased one of these mounters back in 2005. Initially, we looked at the machine because our Hillsborough sister-plant in Oregon had been using the same machine for about three years and had done real well with it."

"Before, it would take one of our mounters about one hour to mount a plate on the print cylinder," continues Matthews. "With the leader machine, they can do it in about ten minutes. From a quality standpoint, one of our biggest downtime problems was sending jobs that were not in registration, or were not quite right, to the printing press, and we would have to go back and rework it. With the Leader machine, we can actually see mathematically before we go to press whether or not the plates are in the proper position. As opposed to looking at a printed proof that may have too much ink to clearly tell if it is in registration, we know exactly what the registration is before we go to press. We have the ability to stop and rework something before it goes to the press instead of afterwards and creating downtime."

"The machine measures four decimal points to the right, so it is extremely accurate," Matthews says. "The tolerance of that machine is well beyond the tolerance of our printing presses. So, if we can get a job mounted correctly on the Leader, then we know it will run efficiently on the press."

"We have experienced a sizable improvement in our delivery of jobs to the press," Matthews explains. "This affords us more run time, and our customers are getting a better product as we are getting better registration on what we are sending to our customers."

A Better Mounting Solution

The Leader Vision system is a state-of-the-art vision system capable of mounting almost every type of flexographic printing plate. The computer and its software take electronic data from the art department and send it directly to the mounter/proofer computer to mount the plate with only two clicks from the mounter operator (remove and then to the press computer). It utilizes a dual camera system, with a large view camera, which locates microdots or reference points on a pre-press table holding the plate to be mounted. The narrow view camera then magnifies the microdots 70 times and pinpoints the exact center-point for accurate registration. The plate is then positioned, and the Leader Vision system brings the plate up against the press cylinder with a pressure roller and applies the plate exactly to a corresponding micro-dot position on the press. Operator variations are removed because this system does not require the operator to position the microdots.

Unusual with plate mounting and proofing systems, the Leader machine ensures good prints from the first revolution of the print cylinder. Excessive plate handling, which causes damaged plates, is eliminated, as is misalignment of plates due to parallax from positioning of the human eye. Vacuum grooves secure the plate to the prepress workstation, eliminating punch holes.

Automated mounting - Leader Vision System

Tighter Plate Registration

The Leader Vision system is so tight on its registration that Weyerhaeuser has uncovered tolerance aberrations in its printing plates that it did not realize existed while using its prior manual plate-mounting method.

"We are working with plates that are 50 x 80 inches in size, large sheets of material," says Matthews. "It is not unreasonable to think that there was going to be some tolerance variations in the plate-making process. The plate makers can introduce variation in the way the plates are made. The timing of the exposure, the timing of the washout, the timing between the washout, and the drying, etc.—if these sequences vary at all in the plate manufacturing process, then one plate will be longer or shorter then the other. These variations affect the registration on press, which are not always evident in traditional mounting systems. The Leader equipment showed up the aberrations immediately and allowed us to compensate for the deviations accordingly. It really brought it to our attention how much unknown variance was occurring on our prior system."

Mounting Multiple Jobs, Mounting Across Shifts, Mid-Run Plate Replacement

One of the key features about this system from an efficiency standpoint is that because the machine mounts the plates—they are not manually mounted—and places them with digital precision, multiple plate mounting cycles can be done simultaneously, and the action of plate mounting can cross work shifts easily without any variation in plate placement accuracy. For example, if three different workers are mounting conventionally, they would have to finish one job before they started the next or risk losing their registration. With the Leader, they can mount a dozen cylinders and a dozen different jobs at the same time—the machine stores the data on all of the coordinates, which can be retrieved at any time. Literally, the system permits entry and retrieval of thousands of mounting jobs.

Likewise, if a print job is in progress and a plate has to be replaced, the cylinder can be pulled out, the plate pulled and replaced with another, which will be positioned in exactly the same place as the prior plate. It is a very exacting and easy process.

Production Down-Time Reduced

The amount of time it takes to get a job on press is typically the same, whether it is a one-roll job or a twenty-roll job. Weyerhaeuser runs a lot of smaller orders of one and two rolls. Instead of spending up to four hours mounting plates for a new one- or two-roll job like before—and running another job as a fill while the next job is being set up—they simply pull the cylinders out of the press, go back to the mounter, and have the cylinders back and ready to go back on the press in a fraction of the time. Downtime has been greatly eliminated with the Leader system.

"From a quantitative standpoint, we have been able to more than double our production, mostly because of an elimination of factors," Matthews says. "There is no layout that needs to be drawn as you would find on a conventional system. There is no inking of plates and cleaning in the proofing process that you would normally require."

"We have also been able to move to a larger plate format, so we are mounting fewer plates per job," continues Matthews. "On our old system, we would probably mount 38 to 35 plates for a seven-color job; now we are more likely doing it with 14 to 21 plates."

"Our employees that have had the proper training on the Leader system have more than doubled their productivity in any given day," Matthews explains. "Our throughput is pretty much driven by how quickly we can move cylinders in and out of the machine, as opposed to the mounting itself. This is quite a difference in this industry."

Mounter with cylinder loading mechanism and laser gauge for checking cylinder quality before mounting - Leader Engineering

"We also have improved our safety in the mounting area, because ergonomic conditions there have been one of our biggest areas of concern," Matthews says. "Rubbing of plates and moving sticky back, etc.- a big cause of carpal tunnel syndrome, these types of things have been eliminated with the Leader machine."

Siemens Automation

The Leader machine includes a palate of high-tech control system components developed by Siemens Energy & Automation, which has provided a total solution for the electrical components in the machine, such as its Simotion® product. Most machines require motion control (positioning, synchronous operation), PLC functionality, and technology tasks (i.e., pressure control and temperature control). The fusion of these functions into one system—as with Simotion—has a number of advantages such as lower engineering costs and higher machine performance, elimination of time-critical interfaces between individual components, and simple, uniform, and transparent programming and diagnostics for the entire machine with a single tool. The focus here is placed on a simple and flexible solution for numerous motion control tasks.

Also, Siemens is providing its SINAMICS S120® drive system, which provides powerful single drives and coordinated drives (multiple-axis applications) supporting vector or servo functions, and Siemens SCALANCE X® Industrial Ethernet Switches.

"Siemens is working with us closely to develop improved control systems for our plate mounting and proofing equipment," says Charles Leader, President of Leader Engineering-Fabrication, Inc. "It is a very close alliance building the best equipment possible for the flexo industry."

"The Leader machine is actually mounting at a higher level of precision than any other system," Leader continues. "We will give our clients the best print possible out of that particular mount and those plates."

"This machine produces a far more accurate registration than one could ever achieve manually or with prior systems," Leader says. "We feel very strongly that this is the future of flexographic mounting.

About Leader

Started in 1984, Leader handles projects from concept through engineering, fabrication, installation and training. The company manufactures the following lines of equipment: (a) Die casting equipment - leak test equipment including trim presses, trim dies, sawing, drilling and milling equipment; (b) Printing equipment - plate wash-out systems, ovens and dryers, and plate light exposure systems; (c) Printing mounting/proofing equipment - computer-operated vision system capable of mounting flexographic printing plates; (d) Food processing equipment - for the preparation, handling, filling and cooling of cans, jars and bags; (e) Custom machine design and build - based on production rates, part sizes, budgets, available floor space, operator ergonomics, safety and maintenance requirements.

For more information on Leader Engineering-Fabrication, Inc., please contact Charles Leader, President; 695 Independence Drive, P.O. Box 670, Napoleon, OH 43545; Phone 419-592-0008; e-mail cleader@lefusa.com; www.flexomounting.com.

About Siemens

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For more information on Siemens automation solutions, please contact Mary Heather Ryals, Marketing Communications Specialist, Siemens Energy & Automation, Inc.; 5300 Triangle Parkway, Norcross, GA 30092; Phone 770-871-3993; e-mail mary.ryals@siemens.com; or visit their Web site at www.sea.siemens.com.

About the Author

Jim McMahon is one of the most published writers of industrial and high-tech feature stories, having appeared in hundreds of publications throughout the world. In any given month, his stories are read by more than a million readers. He is the architect of Performance-Based PR and the author of the book Ultra-Positioning for Industrial & High-Tech Companies. His company, Zebra Communications (www.zebracom.net), is the world's most published industrial and high-tech PR firm.

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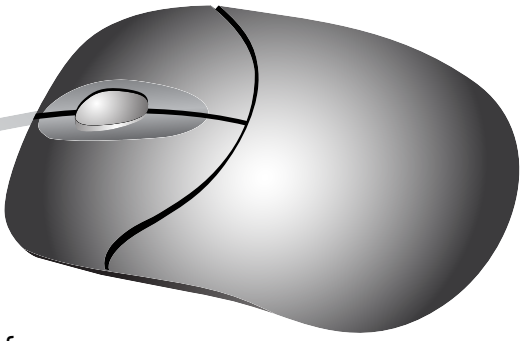

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