

TOOL PRESETTING

a Key to 24/7 Operation

BY
STAFF WRITER

PHOTOS
COURTESY USNR

Plessisville, Que. equipment manufacturer pursues a world-class machining strategy

Olivier Bourque says his manager wants their machine shop to be world-class. The quality control manager at USNR, an international manufacturer of forest products equipment with facilities throughout the U.S. and Canada, Bourque couldn't agree more, and is part of the team responsible for making that goal a reality. With the installation of an Okuma five axis machining centre attached to a 24-pallet flexible manufacturing system (FMS) from Fastems (soon to be 40-pallet), they're well on their way.

Checking boxes

Doing so required more than top-notch machinery. USNR's Plessisville, Que., engineering group has spent the past three years programming jobs, fine-tuning their processes and tooling up the system in preparation for the Holy Grail of any automated machining cell: turning out the lights. Along the way, they found the Achilles heel with which many such shops are familiar—one improperly entered tool offset or toolholder in the wrong pocket can make for a truly awful day.

"The Zoller system ensures that there won't be any mistakes," says Bourque. "You set the toolholder in the presetter, it reads the RFID chip, then calls up the associated measuring program. When done, it writes the tool life and

offset information back to the chip, and when the operator places the toolholder into the machine tool, everything is transferred automatically to the controller. It's very cool technology."

Whether you own a six-person dining room set or a two-story treehouse,



THE CHALLENGE

Eliminate risk to a multimillion-dollar flexible manufacturing system

THE SOLUTION

Use a tool management system with offline tool presetting and integrated RFID tagging



chances are good that USNR built the machinery that processed the wood used to make it. Some of the companies in its broad portfolio date back to the 1850s, manufacturers of sawmill and handling equipment for the logging industry. That tradition continues today, and USNR is recognized as a leader in wood processing systems, producing everything from kilns and log lines to panel saws and lumber stackers.

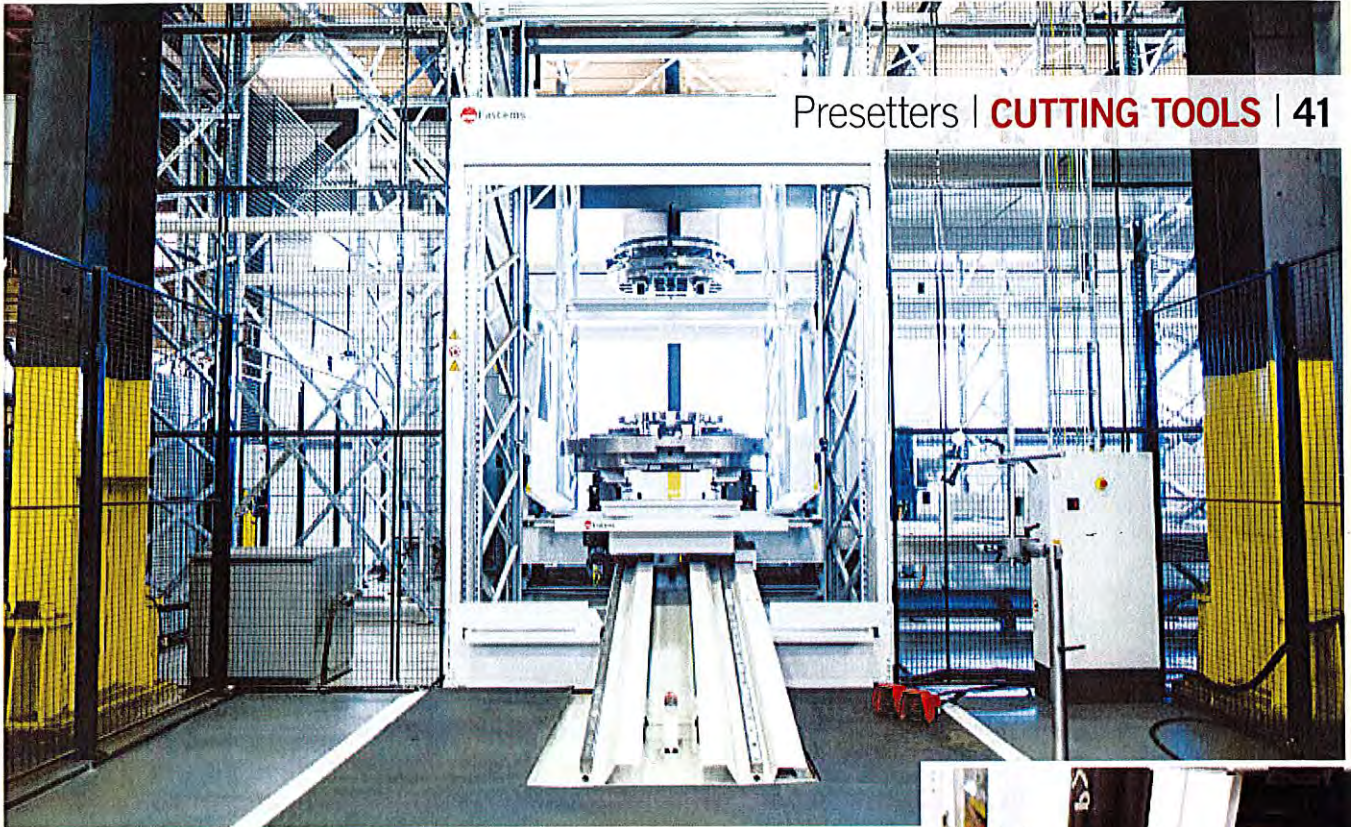
The Plessisville facility where

Bourque works employs approximately 150 people and has more than 30 machine tools on its production floor, roughly half of which are CNC. These include plasma cutters, press brakes, CNC lathes and machining centres, and a "very large" Union boring mill. It's also home to a host of welding, electromechanical assembly and maintenance equipment. "We produce tens of thousands of different parts here each year, whether it's a gear set for a planer mill or a weldment for a plywood press," he says. "We can make pretty much anything."

Closing the loop

Despite these capabilities, the Fastems FMS represents a long-term automation strategy, one poised to significantly alter how this progressive company manufactures parts. In addition to the palletization and presetting functions mentioned earlier, the system also uses Caron Engineering's TMAC (Tool Monitoring Adaptive Control) to constantly check axis loads and spindle torque. If these or other variables go beyond predetermined values, TMAC will either notify the Okuma's control to call up a "sister tool" or alert the operator there's a problem, stopping the program if necessary.

At \$4M, it was a big investment, but it has also proven to be the right decision.



Above: USNR's \$4M investment in a Fastems FMS and Okuma five axis machining centre was "definitely the right decision." As proof, the company plans to expand its capabilities with another machining centre and additional pallet capacity.

Right: By implementing an RFID-reading tool presetter and machine tool, shops not only streamline their setup operations, but they eliminate risk that an operator inadvertently places a tool in the wrong pocket.



Bourque notes that the company plans to expand the FMS with a second machining centre in the not too distant future. They also plan to expand their use of offline presetting, which is currently limited to the Okuma's Capto C8 spindle tooling.

"The FMS has been a very large project for us, so there was a lot that we needed to do before rolling out the presetting part of it to the other machines," he says. "That said, we've found that the system is extremely accurate—I also manage the quality department, so on the few occasions where someone has questioned a tool length or diameter measurement, we've double-checked it on the CMM. The Zoller's always been within a ten-

thousandth of an inch or so."

He's also a fan of Zoller's tool management software, even though he admits to using "maybe 10 per cent of its capabilities." Said Bourque, "It's very complete—almost like an ERP system—which I'm sure will play a big role as we expand to presetting on the other CNC machinery."

The other 90 per cent

None of this surprises Chander Bhardwaj, general manager for Zoller Canada. He explains that the RFID feature has been a game-changer for many shops. "Prior to our developing this capability, there was always the risk that an operator puts a tool in the wrong pocket," he says. "That, and we

wanted an elegant way to update tool life information at the machine tool and have the ability to store it with the toolholder. RFID solves both of these concerns."

It also brings shops one step closer to digital manufacturing, the basic premise behind Industry 4.0 and the Industrial Internet of Things (IIoT). According to Bhardwaj, both of these are further supported by Zoller's software system—which Bourque referred to as "ERP-like" in its capabilities—and pilot 4.0 database, as well as integration to more than 50 CAD/CAM systems with 100 per cent compatibility.

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“With digital manufacturing, you have to make sure that every machine tool, software system, and ancillary equipment on the shop floor is talking to one other,” says Bhardwaj. “You also need a database to store all of the tooling, measuring equipment, and process-related information needed to machine any given component, and make it accessible to other equipment and systems. This is what Zoller has achieved.”

Bhardwaj notes that this information goes well beyond the basic dimensional data and part numbers of a toolholder assembly’s various components. Depending on the software level—Bronze, Silver, or Gold—it includes sourcing and pricing information, maintenance and calibration status, storage and usage locations within the shop, operational characteristics, and “all of the technology data” available on a tooling manufacturer’s website. In addition, it gives users complete visibility to what tooling is needed for a job and when, along with a setup sheet that shows how to assemble and measure it.

“Tool presetting and RFID aside, the capabilities of a full-blown tool management system (TMS) are truly awesome,” he says. “Suddenly there is connectivity, transparency, there is standardization, and there is accountability for everything that touches that database. Tool inventories and setup times go down, while productivity and utilization go up. It’s quite simply one of the best investments that any shop can make.” SMT



The Fastems FMS at USNR boasts generous cutting tool storage and is also equipped with Caron Engineering’s TMAC (Tool Monitoring Adaptive Control) system.

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