

Benchmark Briefing

ASRS for Automated Manufacturing



kardexremstar



Case at a glance

Site

USNR, Woodland, WA, USA

Application

Storage solution for spare parts, tooling and raw materials

Equipment

Four Vertical Lift Module Kardex Shuttles with
Kardex Power Pick System inventory management software

Making the cut

Implementing ASRS makes room for automated manufacturing

USNR, headquartered in Woodland, Washington, USA, is an OEM manufacturer in the wood processing industry. From sawmills and planer mills to plywood and panels, USNR supplies systems and service to wood processing companies around the globe.

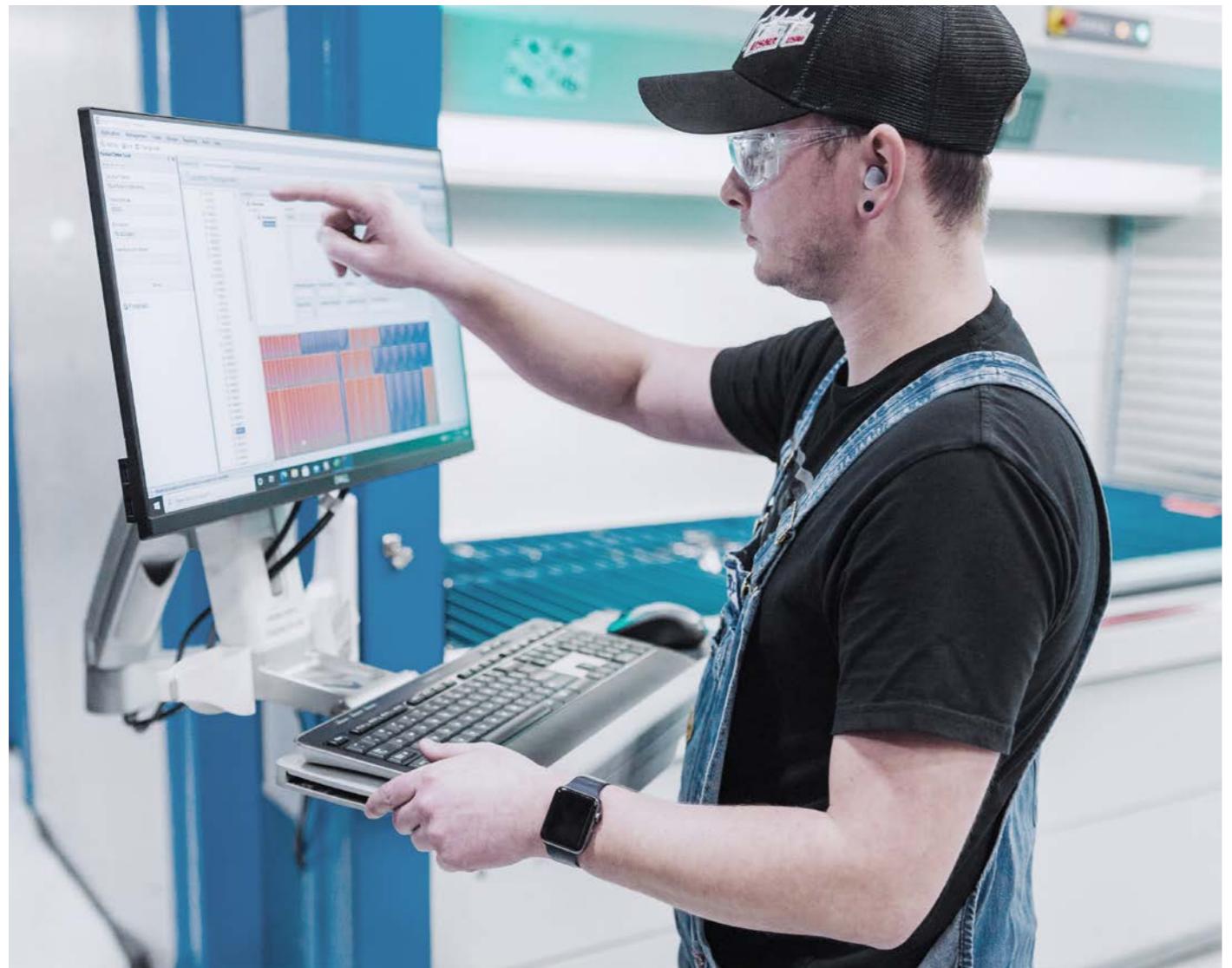
In addition to manufacturing equipment, they also provide replacement parts and support around the clock. As business grew, USNR sought to implement a more efficient, automated manufacturing process.

Four Vertical Lift Module Kardex Shuttles recover 92% floor space, save 53% labor and improve worker ergonomics in manufacturing environment.

Saved
92%
floor space

Reduced
labor
by 53%

Improved
worker
ergonomics



Implementing automation

Phase one of the warehouse redesign integrated two 9.14 m tall Vertical Lift Module Kardex Shuttles (VLMs) integrated with Kardex Power Pick System inventory management software to consolidate warehouse parts storage. All of the small parts stored on shelving and in the mezzanine were moved into the two Kardex Shuttles. "These two Kardex Remstar units allowed me to get rid of the shelving and mezzanine entirely. We needed to make room for the FMS systems and be able to roll the warehouse around throughout the project as the entire facility was going to be rearranged", said Smothers.

The Kardex Shuttles store roughly 2,500 SKUs. These parts are used to fill customer parts orders, spares orders and transfer orders. In addition, the Kardex Shuttles store parts for capital production projects. By consolidating all the parts inventory into these two units, the plant was able to save 92% floor space, eliminating the shelving and mezzanine to make room for the new FMS system. And this was only the beginning.

Main challenges

USNR aimed to upgrade the manufacturing plant by installing a Fastens Flexible Manufacturing System (FMS) to organize and schedule projects, reduce idle time and maximize productivity. However, they didn't have any available space for the system. In order to modernize the plant, they first needed to find space to add this new automated manufacturing system.

They turned their attention to first consolidating the warehouse. Warehouse parts were stored on shelving situated under a second level mezzanine accessible via an elevator. Tooling and raw materials were stored in cabinets and shelving throughout the facility, which was time inefficient. "Adding more shelving to increase capacity within the facility would only take up more space," said Mike Smothers, Operations Manager, "I had to go up, not out."



4 Kardex Shuttles each 9.14 m tall
2 managing 2,500 small parts, 1 storing
tooling & 1 storing raw materials and fixtures



Kardex Power Pick System inventory management software



Manual tray extraction

Material flow & picking processes

Sales orders come in throughout the day from customers needing spare parts or part replacements as well as transfer orders from other USNR facilities. The warehouse also receives production orders for capital projects. Both orders come in through Microsoft AX and push to the Kardex Power Pick System inventory management software.

The VLM operator can then batch orders into groups in Kardex Power Pick System before the picking process starts. Once the orders are organized into a batch, with the push of a button, the Kardex Shuttle moves to deliver the first tray. An inserter extractor runs up and down the middle of the unit which retrieves a tray from either the front or back of the VLM depending on where the items are stored. Items are picked from the tray and it is returned to storage.

This process continues until all parts for the batch are picked. After the picking process is complete, sales orders are either sent to shipping or crating to be packaged with other larger inventory. Orders for capital production are routed to the kitting area to be held until the assembly start date. USNR operates two shifts daily and a shift on the weekend which helps them meet fast delivery times.

Replenishing inventory in the Kardex Shuttles is the same process as picking, just in reverse. Inventory is received through Microsoft AX and pushed to Kardex Power Pick System. The Kardex Shuttles deliver trays to the access opening and direct the operator where to store the parts using pick-to-light technology. USNR has to put away roughly 400-500 lines per week to maintain appropriate stock levels.



Improving labor efficiencies and ergonomics

The Kardex Shuttles operate on the goods to person principle, bringing stored inventory directly to the operator. This eliminates walking to and searching shelving for parts throughout the facility. Now, employees don't need to go up and down the elevator to access parts in the mezzanine either. This saves time and increases productivity throughout the operation. As a result, USNR was able to reduce warehouse labor by 40%.

Additionally, the access opening on the Kardex Shuttle is positioned in the "golden zone", the area between the waist and shoulders. This improves worker ergonomics because employees no longer need to bend down or reach up high for stored parts. "There was definitely a learning curve and bumps along the road at first," Smothers said, "but now my team is operating smoothly, and everything runs great!"



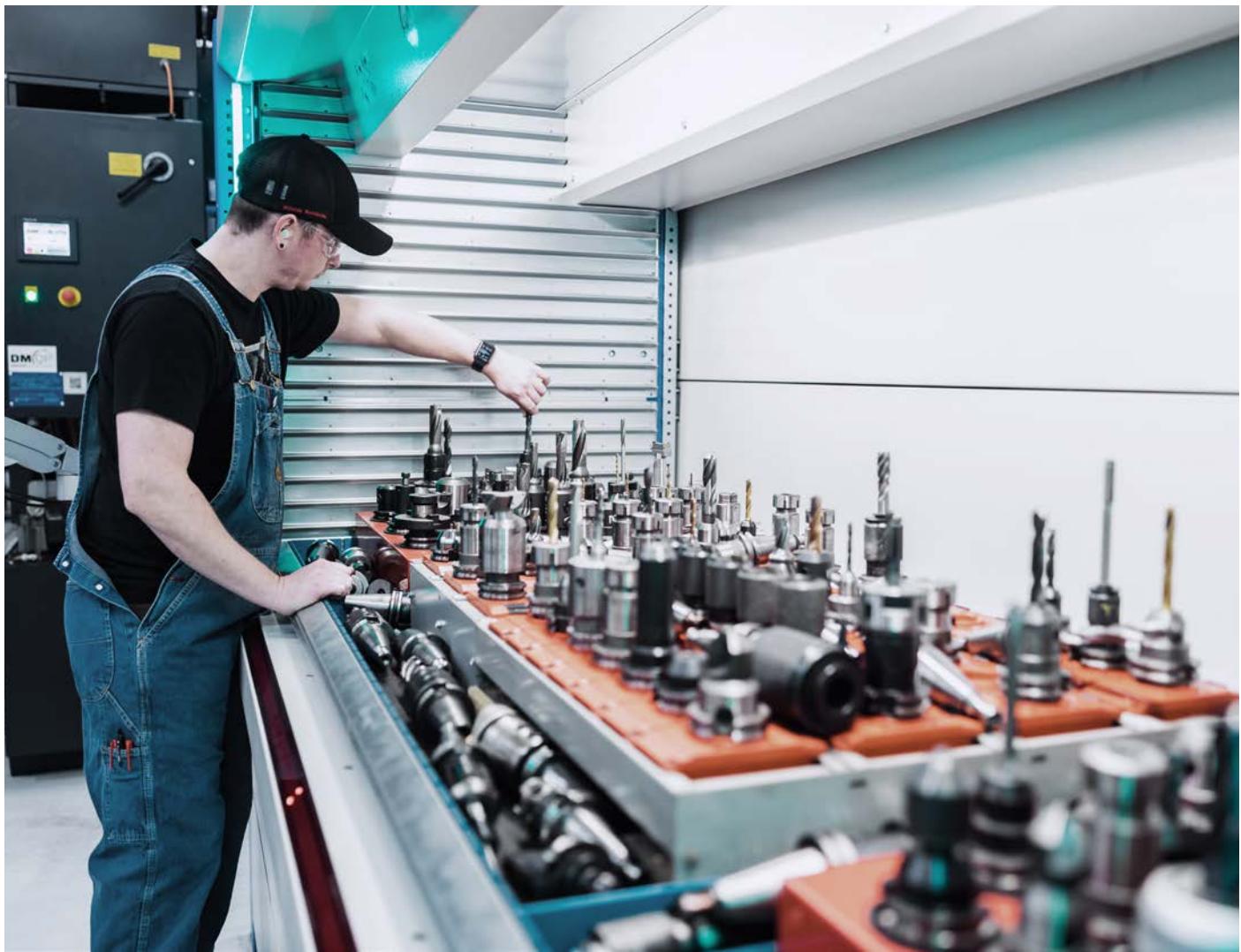
Automation makes the cut

As the facility reorganization continued, USNR also needed a better solution for managing tooling and raw materials. With the success of the warehouse project, Kardex Shuttles were an easy choice.

The tooling needed for manufacturing was previously stored in cabinets, which was disorganized and took up too much space. To increase efficiencies, Smothers added another 9.14 m tall Kardex Shuttle as a standalone toolroom. The entire toolroom is now stored vertically floor to ceiling within a VLM located next to the FMS system. The maintenance VLM stores tools as well as safety and first aid supplies.

To keep tools organized and accounted for, all of the tools were given a part number before being added to the Kardex Shuttle. A maintenance employee is responsible for preparing the tooling needed for each job. The Manufacturing Management Software (MMS) operating system within the FMS automatically communicates to the maintenance department as tools are required to be changed or replaced. When a big job is running the MMS will predict when a current tool will need to be replaced and notify the maintenance department. The toolroom maintenance operator then pulls what is needed from the VLM, configures the tool and is ready to change it when required.

For the FMS to work independently it needs to be loaded with raw materials. To feed the production line faster, a fourth Kardex Shuttle was added to store raw materials and fixtures. A manual extraction table was added to the VLM to make it easier to store and retrieve these raw materials and fixtures. In addition, a bridge crane is positioned in front of the unit to lift heavy materials. To run a project, an operator manually picks materials from the VLM and loads them into the FMS system. The raw materials VLM is located in close proximity to the FMS for efficiency.



Total warehouse upgrade

Though the project was completed in phases, the automation throughout the plant works together to get the job done. Parts are manufactured in the FMS system using raw materials stored in one VLM and with tooling from another. Once parts are made, they are stored in the original two warehouse Kardex Shuttles until they are pulled for customer orders or production cells. "The Kardex Shuttles were the first big move towards a more automated facility," said Smothers.



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