

CASE STUDY

Axcelis Technologies Boosts Productivity, Improves Overall Efficiency with Space-Saving Technology



A manufacturer of ion implanters, a key piece of equipment used in the fabrication of semiconductor chips, implemented an automated parts picking system that combined the benefits of Kardex Vertical Lift Modules (VLMs) and a zone divert conveyor system to increase storage capacity and improve picking processes.

CHALLENGES

Axcelis wanted to improve its space efficiency, boost productivity, enhance picking accuracy, improve control over parts management, and cultivate healthier ergonomic work conditions for stockroom operators. Small-to-medium-sized components essential for assembling ion implanters were stored in bins or within one of eight VLMs in the main warehouse. These components exhibited variations in size, weight, and value, necessitating a versatile approach to their handling and management. The bin storage method required manual picking using step ladders and printed pick sheets. This was physically demanding for the staff and inefficient, resulting in a high incidence of pick errors and operator fatigue.

For parts stored in the VLMs, the picking process was semi-autonomous. Although orders were loaded and assigned to a specific workstation position, which streamlined some of the picking process, the components still needed manual transportation to be consolidated with other parts of the order. Despite being more efficient than manual bin picking, this system faced challenges. The VLMs were operating at full capacity, and there were inefficiencies in how space was utilized within the units. Moreover, the process of putting away items was similar in both storage methods, but they faced the same inefficiencies and challenges.

To address these challenges, Axcelis implemented an audit process for the bin-picked components and introduced additional VLMs, increasing their total from three to eight units. These changes significantly improved storage efficiency and picking ergonomics, while the audit process reduced errors by verifying order accuracy. Although these improvements added extra time to the picking process, the benefits were clear. Axcelis considered further enhancements, such as adding more VLMs, but ultimately decided to construct a dedicated logistics center to bring together multiple warehouses into a state-of-the-art facility spanning over 100,000 sq/ft. to accommodate their explosive growth.

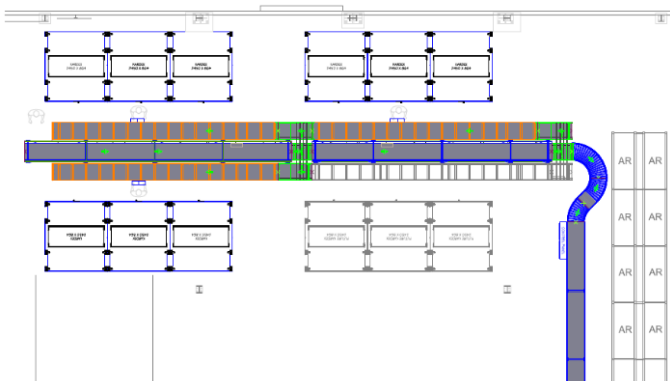


SOLUTION

With the construction of the new logistics center, Axcelis was determined to maximize this space. First, they partnered with Abel Womack, a company with a proven track record and a history of successful projects. Abel Womack's provision of VLMs for their existing setup made them a logical choice for expansion into the new building. Chris George, Chief Manufacturing Officer at Axcelis, said, "A key deciding factor was the superior integration capabilities of Kardex's PPG software with our

ERP system, unmatched by other manufacturers. This compatibility promised a seamless transition and operational efficiency, a strategic decision that would further enhance our operations. It was a bonus that Abel Womack is local, which means a much more favorable response time to come on-site compared to their competitors. These attributes solidified our decision to continue the partnership."

Upon completion of the new logistics center, nine 26' tall VLMs



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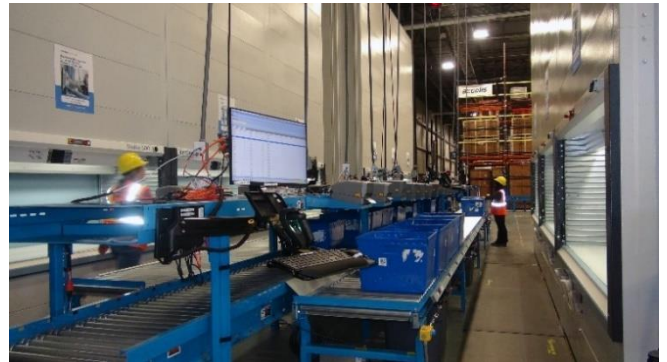
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were divided into three pods, each consisting of three units with pick-to-light functionality and LED light pointers to highlight the correct pick location. This strategic placement maximizes vertical storage potential and allows for a 125% higher capacity in each module compared to the VLMs in the main building. Integral to the total system is a zone divert conveyor system with batch stations each capable of picking 12 orders simultaneously (36 total). Orders are digitally married with totes and inducted into the conveyor using a barcode scanner.

Barcode license plates on the totes are read by camera scanners, which appropriately divert the totes/orders into the zone/batch stations for batch picking based on the SKUs in the order associated with that tote. When all picks in a zone are complete, the tote is pushed onto the centrally located takeaway conveyor and either moved to the next zone for picking or out to the consolidation area. At consolidation, it's scanned and united with other larger parts that have been picked from pallet racking.

This integrated system optimizes the current storage and picking processes as well as positions Axcelis for growth, with room for more pods as the manufacturing operation expands. It also facilitates a seamless transition from the old warehouses by enabling the direct transfer of shelves in the existing VLM to the new units, streamlining the deployment process and minimizing operational disruptions. Collaborative efforts between Abel Womack, Kardex, and Axcelis' IT Department were essential for software customizations, which enabled them to move shelves quickly and efficiently from the original VLMs. More importantly, PPG communicated directly to Axcelis' ERP system.



RESULTS

The automated VLM and conveyor system effectively addressed the challenge of prolonged parts picking and manufacturing delays. Implementing VLMs notably enhanced pick accuracy, significantly reducing the labor hours previously dedicated to returning misplaced parts and searching for the correct components. “This improvement not only streamlined our operations but also led to a reduction in labor costs. Additionally, the VLMs contributed to increased picking capacity, simultaneously reducing training time and physical strain by eliminating manual efforts inherent in the legacy process. This, in turn, significantly enhanced our workflow's optimization, reinforcing our processes and overall efficiency,” stated George.

BENEFITS

- Enhanced pick rates
- Error reduction
- Scaled benefits of VLMs
- Utilized vertical space
- Improved ergonomics

Deploying this solution had three measurable impacts. One was enhanced pick rates, which substantially improved efficiency and output compared to the old system. The prior pick time per line was reduced from three minutes without VLMs to 90 seconds with eight units at the main building. The nine new VLMs, conveyor system, and further optimization led to a remarkable decrease to just 30 seconds per line—a 67% reduction! The second benefit was error reduction. This solution, including pick-to-light, introduced a high level of error-proofing to the picking and put-away process, minimizing mistakes in material handling and contributing to smoother operations. The final enhancement was VLMs' scaled benefits across a broader company spectrum. Scalability underlines the adaptability and effectiveness of the implemented solution in addressing the operational growth challenges.

“Abel Womack has been customer-focused in providing inventory management solutions that are scalable to our business growth, said George. They are highly responsive to our needs and hold themselves accountable for efficiency improvements, customer satisfaction and material accuracy. Their knowledgeable team continues developing new ideas and concepts that will help improve our business performance for many years.”