COLBERT PACKAGING

December 2024

CASE STUDY

Robotics Implementation

A Study in Automation

Company Name:
COLBERT PACKAGING CORPORATION

Location:
ELKHART, IN USA

OVERVIEW

At Colbert Packaging, we convert sustainable fiber-based packaging, serving the pharmaceutical, healthcare and consumer goods markets. Our customers demand quick turnaround and quality products. As a best practice, through a continuous improvement process, we routinely identify areas of opportunity within our operations. Recently, we engaged in an overall review of our palletization process and our analysis determined a need for improved efficiency, quality and accuracy. The project included a cross-functional team of engaged employees, and through their analysis, and improvement suggestions, it resulted in the proposal and subsequent investment in palletization robotics.

DEFINING THE CHALLENGE

Given the nature of our customers' requirements, we must comply with meticulous labeling and case pack configurations. For example, in a typical shift, production associates can encounter as many as 400 different labeling, carton sizes, case sizes and pallet configurations, at multiple cases per minute. We observed opportunities for nonconformances and elevated employee injury risks with the current process. Since more than one member of our management team was already familiar with robotic palletization, we discussed some of the possibilities and agreed to explore suitable options for Colbert's unique customer requirements.

The most common nonconformances were usually the result of case/carton deflection, incorrect case label facing, and sometimes from improper manual inversion (lifting and flipping cases—some weighing up to 40 lbs). Though rare, correcting one such occurrence in a week may have a ripple effect on production scheduling. Most nonconformances involve case and label configuration; rectifying one such issue may require manual re-labeling or re-palletizing.

Reported employee injuries were most often cited as repetitive motion injuries. We care for the safety of each employee and respect the long-term investment many have made to grow with us. Over 60% of our workforce has more than five years of service. For that reason, it is also important that those employees impacted by our automated solutions have opportunities for advancement within the company.

VENDOR SELECTION

The project team, led by VP of Corporate Technical Sales Brad Davis, was an interdisciplinary group representing Production, IT and Maintenance. Brad took on the role of primary information gathering and investigating various solution providers and presenting his findings to the team. Initially, they reviewed six prospective vendors. "By the time we were looking at the final three," recalls Davis, "the whole team was fully familiar with the subject. The decision to work with our final choice, an industrial robot integration provider, was unanimous."

VENDOR REVIEW

Primary considerations for vendor selection:

- Human factor is most important – internal and external daily support
- Price – must offer solutions in line with our budget
- Service – we needed to be confident in the promised service level
- Additional and future automation opportunities (full-service integrated automation provider)
- Working rapport with the project team – responsive, creative, and effective communicators
- Post-implementation services – we required assurance that system experts be made available on demand
- The chosen provider constructed and tested our entire system offsite, permitting us to observe and monitor the new equipment without interrupting production

While robotic palletizing is not cutting-edge technology, it was important that the design/build companies that made it to the final stage-gate were those whom we felt best understood our needs and were able to flex and readily respond to custom change requests.

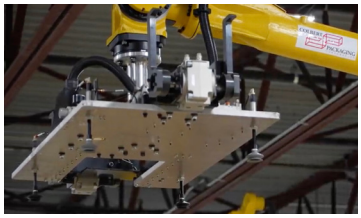
Colbert employees embraced this automation. A contest was held for employees to name their new robotic coworkers. The winning names, "Bud". "Cole" and "Bert" pay homage to the company's founder Charles "Bud" Colbert.

DESIGN CONSIDERATIONS

Not only did the new floorplan need to accommodate the desired automation, but we had to work with location-specific constraints, such as ceiling height and existing walls. The winning project plan included a design blueprint, integration plan and meticulous cycle time calculations before final implementation.

Key Features of the new automation:

- **Multifunctional Pallet Handling** – The system adeptly picks and places multiple pallet sizes and types concurrently. This adaptability allows for smoother transitions between various pallet types, optimizing the workflow and reducing system downtime. Efficient pallet loading and alignment is essential for smooth operations, and with the new system, every pallet pack is done with precision.
- **Automated Labeling** (integrated into our current ERP system) – Cases are efficiently labeled and placed onto pallets, with the added functionality of inverting cases as necessary. This dual function ensures products are correctly oriented for palletizing, shipping and storage, streamlining subsequent handling stages and meeting the various customer specifications.
- **Superior Tracking Capabilities** – Integration of sequential barcodes on each pallet ensures meticulous and automated lot control for product traceability. This level of detail provides controls for Colbert Packaging and its customers.
- **Safety First** – By taking on the burden of heavy lifting, the automated system safeguards the health and safety of Colbert associates by minimizing the risk of workplace injuries. This fosters a more sustainable work environment, decreasing physical strain for associates, reducing turnover and offering alternative options for associates.
- **End-of-Arm Tool (EOA)** – This is a custom piece assigned to one of the robots for our customers that have cases with open tops. By omitting the corrugated box tops, our customer reduces consumption and waste and saves on labor. The EOA tool inserts interior trays separated by slip sheets.



LESSONS LEARNED

Don't plan this during a supply chain disaster! Surprisingly enough, the actual robots did not have the longest lead time. Rather, the chip for the case labels module took the longest. Supplies that normally took 8-10 weeks took 52 weeks. We learned economic timing is a critical factor in the planning of an implementation such as this.

PROJECT WINS

The final solution in our project includes two robots, each deftly handling three gluer/conveyors, and a third robot that picks and loads pallets onto a T-car.

- In the end, no affected employees were laid off as a result of this automation project, and they were able to move into other positions.
- Downtime was minimal during conversion. Although we had to break through a wall to connect the finishing area to the shipping area (which took a couple of days), production did not experience a total shutdown at any time.
- ERP integration
- This CI initiative has led to improved efficiencies, improved case stacking consistency, minimized bottom case/carton damage due to deflection, reduced label costs, and enhanced anti-mix prevention along with the allocation of labor to more technical assignments.