



Erect, Pack, Seal & Palletize System Laundry Scent Booster Bottles

Project Overview

This contract manufacturer was preparing to open a new secondary packaging operation, dedicated to a multinational producer of personal and household care products. The complexity of the operation required an innovative partner capable of providing a comprehensive solution on a short timeline.

Customer Objectives

Consistent production capacity

The amount of manpower needed to achieve production rates was unrealistic by volume, associated cost and the inability to form bliss boxes by hand

Increased reliability, reduced downtime and reduced human errors were critical project requirements

The customer hoped to gather system analytics by tying into an existing SCADA system

Flexibility to handle product & case variation

The optimal solution needed to accommodate both RSCs and bliss boxes within the same system, along with 10 different product/pack configurations and two different pallet configurations

Superior product handling was necessary to reliably transport and pack tall, unstable products, featuring a scent-release cap design that was not compatible with traditional vacuum-pick technology

Optimal buffering and accumulation within a limited floor space was crucial to maximize system uptime and availability to support production requirements

Aggressive production start date

Quick turnaround of a system concept, quote and build was critical to meet the customer's contracted timeline for production start-up

Pearson Solutions

Automation ensures consistently high production rates of 300 products/75 cases per minute as opposed to a sister facility utilizing manual labor for its secondary packaging process

The use of robotics provides a high level of reliability (80-100,000 hours Mean Time Between Failure [MTBF]), effectively reducing maintenance and downtime

Automatic tool change on the robotic packers and palletizers provides faster, more efficient changeovers

Pearson's PackML-compliant equipment provides a common platform across all equipment and easy access to machine data

The incorporation of case erectors and sealers accommodate RSCs, while a bliss former with a sealer bypass produces open-top display boxes

Conveyor rails guide and stabilize products entering the packing station and timing screws divert and group products into appropriate pack patterns

Four robotic top loaders (each equipped with three end-of-arm tools for varying product sizes) grip products at the neck rather than by the cap

Two end-of-arm palletizing tools quickly switch between RSC and bliss display boxes

Pearson's two week quote turnaround and industry leading 22-week lead time for the entire system beats industry average lead times of 28-30 weeks. Lead times were achievable as a result of:

- A consultative design approach to gain thorough understanding of the requirements, despite a lack of product samples
- Pearson's ability to source a majority of system components including all required erect, pack, seal and palletize equipment from its own portfolio
- Full integration of third-party equipment, simplifying logistics and commissioning
- User Centric Design's uniform interface, which hastens the learning curve for operators and maintenance technicians to quickly navigate the HMI and equipment

Sequence of Operation:

Two Pearson CE50-G Case Erectors use top and bottom vacuum and a servo-driven set-up arm to erect knockdown RSCs (regular slotted containers). The minor flaps are closed, hot melt glue is applied, and a compression ram presses into the case to close the major flaps against a back-up plate. The erected cases are rotated 90 degrees at the discharge to be turned upright and conveyed away.

An existing third-party bliss former is integrated to form display bliss cases for bulk product runs. A bypass mode enables open bliss boxes to travel through the sealer along the same path as the RSCs, keeping conveying and overall footprint to a minimum.

The continuous motion sidebelt conveyors transport the cases/boxes to dual packing stations. One timing screw diverts the products into two lanes, while a second timing screw groups them into the appropriate pack pattern. Line tracking determines the product location.

Four FANUC LRMate 200iD/7L robots use a custom end-of-arm gripper tool to pick and place products into the cases in arrangements of 4, 6 and 8-packs. Auto tool change reduces changeover time between product sizes and pack patterns.

Filled cases are identified with a barcode label, applied by a set of integrated print and apply labelers. A pair of third-party checkweighers with reject stations ensure cases are complete.

Two Pearson CS40-67G Case Sealers fold the RSC minor flaps, then apply hot melt glue and fold the major flaps. Cases are conveyed beneath compression rollers for sealing.

In the palletizing cell, a pallet is released from the dispenser and conveyed to the load build station. The FANUC M-410iC/185 palletizing robot picks a slip-sheet from the automatic dispenser as it receives RSCs from two lanes. As an alternative, bliss boxes are received in a single lane and also palletized in the cell. The cases/boxes are turned and accumulated for picking. RSCs are picked with a custom vacuum end-of-arm tool, while bliss boxes are picked with a custom fork tool and layered according to the selected pack pattern. Automatic tool change simplifies the transition between different case/box styles.

Once a pallet stack is complete and discharged from the cell, it is transferred to an automatic stretchwrapper where the pallet stack is wrapped. Finally, a takeaway conveyor transports the pallet to a third-party label printer which tags the pallet stack for shipping, and the sequence repeats.

