



## High-Speed Partition Inserter

### Wine Bottle Application

#### Project Overview

This award-winning winery wanted to replace its mechanical partition inserter with a robotic solution to overcome constant mechanical issues and cumbersome changeovers. Having already established a positive relationship with Pearson through a previous Robotic Partition Inserter project, the customer returned to us for another small footprint solution to support increased rates, a variety of case sizes and minimal maintenance requirements.

## Customer Objectives

### Increased rates in a flexible, small footprint solution

Coping with the current inserter's ongoing mechanical issues, the customer employed manual labor loading the six- or 12-cell partitions, which limited insertion rates to 18 partitions per minute (ppm). This solution was not sustainable from a cost and speed perspective. In addition, the customer desired a small solution that was flexible enough to adapt to expanding product types and configurations.

### Minimal bottle breakage, high-quality product

An industry trend towards thinner glass resulted in significant bottle breakage on the customer's existing robotic partition inserting line. The start-stop motion of the conveyor entering the cell caused the bottles to bump into each other and frequently break. Although the customer was very satisfied with the overall reliability and low maintenance of the robotic solution, the new system replacing the mechanical inserter on a different line also needed to minimize the bottle breakage issue.

Furthermore, to be able to securely close the case, full insertion of the partitions into the tight, enclosed space without damage to the partitions or cases needed to be ensured.

### Simple, fast changeovers

The ideal solution needed to not only accommodate all existing case configurations but also potential future configurations including varying bottle sizes and pack patterns.

Despite the desired flexibility, changeover time was a major concern and needed to be as short as possible.

## Pearson Solutions

The new system features four six-axis robots in total: three FANUC M-10iA/12S robots and one Fanuc LRMate 200iD. The three M-10iA/12S share the product workload to achieve insertion rates of up to 55 ppm, effectively tripling current production capacity.

With necessary safety guarding Pearson's solution is not only more functional, but also occupies a smaller space compared to the mechanical partition inserter.

Utilizing continuous motion conveying in place of the start-stop motion facilitates smooth case transport and effectively eliminated bottle breakage and any associated downtime.

To ensure reliable and accurate partition placement and the three M-10iA/12 robots gently peel the blanks from the magazine and open the partitions via adjustable fingers and controlled arm rotation. As the cases enter the insertion area, the robots use line tracking to verify the orientation and position of each case. The partition is then inserted in an angled motion that reduces the risk of partition damage. In the final step, the single LRMate 200iD robot, also equipped with line tracking, presses the partition below the flap score line to ensure proper flap closure.

Since the FANUC robots offer a Mean Time Between Failure (MTBF) of 80-100,000 hours with only few mechanical parts susceptible to wear or malfunction, desired reliability and low maintenance could be guaranteed again, resulting in a customer-reported reduction of labor of 15% on this machine alone.

Once a recipe had been programmed, changeover became as simple as pushing a button and changing some fingers on the robot. Pearson's user-friendly HMI further simplifies the process with its intuitive, icon-based interface. After implementation of the new system, the customer reported a reduction in changeover speed of 75%.

## Sequence of Operation:

Fully formed RSC cases are transported into the case infeed using continuous motion side belt conveying.

Six- or 12-cell chipboard partitions are loaded upright, narrow side leading into three dual-motorized partition magazines. Three FANUC M-10iA/12S robots, fitted with adjustable fingers and programmed with articulating motion, then “peel” partition blanks from the stack. The partitions are opened with controlled arm rotation.

As cases enter the packing station, the robots use line tracking to the gauge position of each case. The partition is inserted in an angled motion that reduces the risk of partition damage usually due to folding or bending. A single LRMate 200iD robot, also equipped with line tracking, tamps the partition below the flap score line.

The cases with partitions exit the line and the cycle repeats.

