

## Picking pizza picker Case study: Vortex Systems and Panidea

A good pizza maker is hard to find. For an industrial pizza producer, making the pizza is only the first part of the problem. It must be frozen, sorted, wrapped and packaged in accordance with regulations for freshness and hygiene, and must not lose its attractiveness during this process.

### The challenge

The Italian system integrator Vortex, was asked by Panidea, a pizza producer in Italy to design an automated packaging system for frozen pizzas. Pizzas coming from a freezer were to be loaded into a flow-pack machine before going to the cartoning machine. The major challenge was to handle four different products – triangular, circular and oval shaped pizzas. Furthermore, the customer wanted a fully flexible and scalable system, where new products (new shapes, sizes, types) could be introduced and the capacity increased over time.

A specific challenge with pizzas lies in the fact that they are not collated neatly on the line and may not be perfectly uniform in shape. The pizzas also must be handled delicately with the gripper: there may be cheese or other items on top of the pizza and these can't be lost in the trip from line to the package.

Looking at the requirements of the pizza packaging system, Italian system integrator Vortex Systems concluded that this total flexibility in combination with high capacity could only be achieved with ABB's FlexPicker and its PickMaster software for vision guidance.

### The ABB FlexPicker and ABB PickMaster technology

The FlexPicker is a parallel kinematics robot which offers a great combination of speed and flexibility. With picking rates exceeding 120 items per minute, the products can be picked and placed one by one. Since all the motors and gears are fixed on the base of the robot, the mass of the moving arms is limited to a few kg. This means that accelerations above 10g can be achieved.

The FlexPicker has a hygienic design with no painted surfaces.



Fulfilling ingress protection norm IP67 it can be washed with low-pressure water and detergents. These features make it ideal for packaging of open food. The fact that the robot is top-mounted means it doesn't restrict access to the robot line, a feature that is appreciated by operators and maintenance personnel. The FlexPicker is powered by the IRC5 controller which allows for conveyor tracking functionality. This means that the FlexPicker can pick and place while the product is moving on the belt. This is necessary in order not to lose valuable time starting and stopping the conveyor.

The PickMaster gives eyes to the robots. The products are normally arranged randomly on a conveyor belt and the robots need to know their location to pick them up. PickMaster is a PC software package incorporating a Cognex vision system. Furthermore, PickMaster makes the programming of multiple robots (up to eight), cameras and conveyor belts an easy task, even for a not very experienced robot programmer.

### The ABB – Vortex partnership

Vortex Systems was founded in 1987. At that time in Italy, robots were used for automotive production lines, not for food. But through a series of encounters, Vortex Systems was confronted with the problem of designing machinery for packaging ice cream cones. The opportunity came about by chance, but Vortex Systems devoted itself to the challenge of packaging frozen foods.

# Picking pizza picker



**Picking pizzas from a moving conveyor belt. One wrong move and all the accoutrements are spilled onto the factory floor.**

The partnership with ABB and the FlexPicker product has enabled Vortex to compete with much larger German and Swiss competitors. This has contributed to Vortex's growth and given the company a better presence internationally. This was the beginning of the very successful partnership between ABB and Vortex, resulting in this pizza-packaging project and other exciting business opportunities. ABB has the robot and the software and Vortex (and the CT group) the experience in building turnkey solutions for the frozen food industry.

## The solution

The loading system contains two FlexPicker robots and a PickMaster with one camera each. Should Panidea wish to upgrade the capacity of the system, the layout has room for a third robot at the end of the line. This pizza loading system is the first of its kind in Italy.

A key to the success has been the gripper design. Although single grippers are simpler and cheaper than multi-grippers, the high capacity and product variation makes gripping technology very important. In this project, there are two types of grippers depending on product type. A finger like gripper is used for some formats while others are handled with a faster vacuum gripper.

The flexibility is very valuable to the customer. Since four different products are produced and packaged at the same line, the optimal mix of products can be produced depending on consumer demand. Each robot has a capacity of 60–80 pizzas per minute depending on the type of gripper being used, vacuum gripper the faster technology. If a third robot is added to the line, the maximum capacity of the system will be 240 pizza portions per minute.

The cameras and the Cognex vision system locate the pizzas and feed the positions to the robot controller. The products don't have to be guided or pre-arranged by traditional hard-automation, which would have been very difficult for pizzas. On the contrary, they can be fed on normal flat conveyor belt for all product variants. The FlexPicker robots and vision system take care of the rest. The result is a cleaner robot-based system with less mechanical peripherals.

## Customer confidence

According to personnel at Panidea, the FlexPicker system installation went very smoothly and took some two weeks. The reliability has been very good since the installation in March 2004. According to Panidea engineers, this is probably the only way to automate this application with such a great combination of flexibility and speed. Those manufacturers, who have been quick to adopt and install new packaging systems, are stealing an edge over their rivals.

## FACTS

Key benefits

- Outstanding flexibility
- Labour cost reduction
- Quick change-over

## VORTEX FACTS

Vortex Systems

Today Vortex Systems is part of the CT Group. Its sister companies are Catta27: ice cream process, Otem: flowpack machines and Mopa: feeding systems. Together with Vortex, this group represents a global player in providing integrated solutions to different packaging and process needs. Vortex is located in Fossalta, near Ferrara in Northern Italy, where the traditions of machine making are almost as deeply rooted as those of cooking.

For more information see [www.vortexsystems.com](http://www.vortexsystems.com)

## ABB Robotics

[www.abb.com/robotics](http://www.abb.com/robotics)