

# Conveyor Manufacturer Improves the Performance of its Food Sortation System

**Arena**<sup>®</sup>

## Solutions

A detailed Arena<sup>®</sup> simulation model was developed to represent the sortation system, input conveyor and exit conveyor of a food sortation system.

## Results

- Model allowed for selection between two types of release mechanisms on the conveyor
- Analysts could now observe the movement of pies on the line and track line statistics
- By studying alternative scenarios, the company was able to improve key performance areas



## Background

A U.S.-based manufacturer produces continuous, plastic-chain, curving conveyors used primarily for food production, but which are also widely used in packaging, pharmaceuticals, and manufacturing. In addition to conveyor systems, this manufacturer also produces a complete line of transfers for handling products at the start and end points of the conveyor.

## The Challenges

A food sortation system developed at “XYZ Company” was designed to take a random stream of frozen pies from a wide belt conveyor and manipulate them to generate single-file output—without pies colliding during the process. The sortation system, already installed at XYZ’s client site, was not meeting three key performance criteria:

1. No pie collisions;
2. The ability to meet a maximum input rate of 50 pies per minute;
3. A minimum 17-inch distance between pie centers upon exit.

The manufacturer wanted the ability to manipulate the sortation system mechanics to improve the system’s performance.

LISTEN.  
THINK.  
SOLVE.™

## The Deliverables

Since the system had been installed already and was in operation on a daily basis, the conveyor manufacturer partnered with Rockwell Automation Consulting Services to build a model using Rockwell Software's Arena® simulation software. The model was built to represent the sortation system, input conveyor, and exit conveyor. A front-end interface was developed in Microsoft® Excel that allowed manipulation of the sorter timing mechanisms, conveyor speeds, and pie interarrival times. According to the project manager at XYZ Company, "We selected Rockwell Software...because we thought they had the best package on the market. The graphics in Arena just verified our earlier decision."

The Arena model was constructed to allow selection between two types of release mechanisms, one which was timer-based and another which was sensor-based. An animation of the system was developed in Arena so that analysts could observe the movement of pies and keep track of vital statistics during the course of the run. "Simulation allows me to test different concepts without having to build prototypes," adds the product manager.

## The Results

XYZ Company used the simulation model to test a strictly sensor-based system, a strictly timer-based system, and a combination of the two. The third option was selected because, during simulation runs, the sensor-based system increased the number of high-velocity pie collisions that occurred, and the timer-based system built up too many queues inside the sortation system (due to the random nature of the pie arrivals). The combination alternative brought together the best of the first two options and has proven 95% to 98% effective in meeting the system objectives.

## For More Information

To learn more about the Arena family of simulation products, visit [www.arenasimulation.com](http://www.arenasimulation.com). For more information about Rockwell Software, visit [www.rockwellsoftware.com](http://www.rockwellsoftware.com).

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