

Conveyor handles desserts with a delicate touch

An automated packaging line, equipped with smart conveyor technology, processes 45 frozen cheesecakes per minute with a **PRODUCT INTEGRITY RATE OF 99.9 PERCENT.**

Jim McMahon, Contributing Writer

When Culinary Art's Specialties Inc., a manufacturer of frozen cheesecakes, made the decision to expand its plant and build a new manufacturing facility in Cheektowaga, NY, outside of Buffalo, it incorporated the switch from a manual packaging line to an automated system that would be capable of handling throughput of 45 frozen cheesecakes/min.

It was critical to move the delicate frozen desserts through the packaging cycle with placement precision and without creating defects in the cheesecakes while toppings were applied, plastic domes were put in place, and the cakes were shrink-wrapped, individually boxed, labeled and case packed.

To achieve this, Culinary Arts used a conveying solution from **Shuttleworth Inc.** incorporating multiple features for handling the company's delicate product line. The end-of-line conveying system provides precise product placement for shrink wrapping, labeling and case packing, minimized product contact with the conveyor and virtually eliminated cheesecake damage, a problem the company was experiencing with its prior manual packaging.

Cheesecake manufacturing

Culinary Art's is all about cheesecake manufacturing. The company was founded in 1982 by Arthur Keller, a Swiss pastry chef who developed an exclusive baking process now used in the company's famous New York cheesecake. Today, Culinary Art's has become one of the finest cheesecake manufacturing companies in the world, producing dozens of cheesecake varieties with a seemingly endless variety of toppings.

Its main focus is in the private-label retail segment, which accounts for 80 percent of its business. The company delivers a line of in-plant contract manufacturing services ranging from product development to manufacturing to packaging.

Culinary Art's serves many supermarket chains in both the frozen grocery and bakery divisions, in addition to food service distributors, and serves



Motorized rollers can modulate the speed of different sections of the conveyor using a central-control HMI.

as a co-packer for some of the most well-known international retail and institutional cheesecake labels on the market today.

The company also packages and markets its cheesecakes under its own brand, Arthur Pauls.

Having recently expanded its production space from 18,000 sq ft to a 53,000 sq ft, the company's cheesecake-making operation is new from the ground up. The facility has the capacity to produce, freeze and ship 150,000 lbs of the dessert each week—30,000 cheesecakes each day.

Engineering a conveying line to handle cheesecakes requires a delicate touch so as not to mar the cakes. The visual presentation of the product is a significant factor in its appeal to customers. Nowhere in the production process is the handling of the product more critical than in the end-of-line packaging, and particularly in the conveying of the cheesecakes through the packaging cycle. Yet many systems that handle such delicate desserts run a high defect rate resulting in damaged products, lessened throughput and increased production costs.

"When we planned the move to our new building, we redesigned the entire production process," says Art Keller, vp of operations for Culinary Art's. "We started from scratch and designed a facility that

was cut out to do exactly what we wanted it to do—manufacture the world's best cheesecakes with a high level of throughput efficiency without sacrificing product quality. We looked at a number of conveyor systems but they permitted too much contact with the cheesecakes. It was a huge issue for us."

Additionally, the company wanted to minimize the amount of cheesecake residue deposited on the conveying system for food safety reasons.

All lined up

Before the cheesecakes reach the packaging line, they start out as empty pans that are filled with a layer of crumbs, on top of which piston fillers deposit the cake batter. Some cheesecake recipes may get three batter deposits from separate filling machines—in addition to the basic batter, a flavored swirl batter or fruit batter might be added. These batters are mixed previously to recipe specifications.

The cheesecakes are then baked in ovens, removed and put through the -30-deg F blast freezer, then moved into the 0-deg F holding freezer for staging before being released for packaging.

When that happens, the cakes are then placed on

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line for a period of time instead of stopping. A low-pressure accumulation buffer absorbs irregularities in the production flow, and provides a smooth, even flow on the line, which minimizes the cheesecakes from bumping into each other.

Slip-Torque uses individually powered rotating roller shafts and loose-fit rollers, which become the conveyor surface, powered by a continuous chain to control the drive

force for the cheesecakes. The size and weight of the cheesecakes determine the driving force of the rollers in the conveyor system.

When the cakes stop on the surface of the conveyor, the segmented rollers beneath them also stop, generating low back-pressure accumulation, minimizing cheesecake damage.

The stainless-steel conveyor is food-grade, heavy washdown and rated for 2,000 psi.

When the cheesecakes leave the shrink wrapper, they are placed into cartons. The conveyor runs parallel to the cartoner and is synchronized with it. As a cheesecake passes on the conveyor in front of a worker, the cartoner presents an open carton and the worker manually slides it into the carton.

The conveyor/product and carton are precisely sequenced. The conveyor then rotates the cartons

and indexes them into a printer, which stamps a date code on the cartons as they pass the printer.

“Shuttleworth designed this part of the conveyor with tightly spaced rollers so we get a perfectly smooth motion as the boxes go by the printhead,” Keller explains. “The resulting code is very legible. With our prior system, we were having difficulty with blurring of the printed codes because of vibration as the cartons were passing.”

“Depending on the client, they require the code to be placed in different locations,” he adds. “The new conveyor integrates an adjustable post that tilts the box to allow the printer to imprint at the desired box position.”

The conveyor then routes the cartons to a case packer, where the low back-pressure accumulation system is used to stage the cartons for entry into the case packer.

This 40-ft section of the conveyor from the shrink wrapper to the case packer, similar to the front 16-ft conveyor, is equipped with motorized rollers that can modulate the speed of different sections of the conveyor via a central control HMI. This means product can be moving at variable speeds on different sections of the conveyor as dictated by throughput requirements.

In designing this automated line, Culinary Art’s has improved on the product quality it had with its manual processes.

“The packaging line automation has significantly reduced our product defects to less than one-tenth of one percent, while increasing our throughput,” Keller explains. “This significantly surpasses what we could do on a manual level. With the success of this line we are now building-out a second automated packaging line to further streamline our cheesecake production.”

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