



THE PERFECT GIFT

Online gift shop boost throughput and accuracy while minimizing human error with smart conveying technology

BY SYDNEY RIGGS

Today's e-commerce companies are challenged so quickly to fulfill their orders that next-day, and even same-day deliveries are no longer perks for e-commerce consumers—they are expectations.

Consumers are demanding more choices, and are willing to change brand allegiance to get better value and service. To remain competitive, every step in the e-commerce fulfillment process must be handled accurately, efficiently and quickly to maintain a positive customer experience.

One company that has mastered this challenge with aplomb is **YourSurprise.com (YourSurprise)**, a Dutch online fulfillment company that markets personalized gift items to a wide and diverse marketplace comprising 22 countries.

Founded in in 2005, the company has seen consistent rapid



Located in The Netherlands, the YourSurprise fulfillment center serves a fast-growing international customer base comprising 22 countries, shipping about two million personalized gifts per year.





growth in sales, and particularly so within the past seven to eight years, when its orders have increased significantly. Today, YourSurprise is shipping around two million gifts per year, with an annual growth rate of 30 to 40 per cent.

“We are working with emotional products that improve the bond between people,” says YourSurprise production manager Bartjan van Damme.

“These gifts include products like pendants, chocolates, photo albums, mugs and custom shirts,” van Damme says.

“The distinguishing factor that truly sets YourSurprise apart from other fulfillment companies is that ours are specialized products that are all personalized.”

By their very nature, personalized gift items require delicate handling. Manual fulfillment of these items is fine with low order counts, but as YourSurprise expanded and transitioned from a small online boutique to a company with major production throughput, the challenges of order accuracy and on-time delivery accelerated exponentially.

“Because of our accelerated growth in the numbers of gifts needing to be shipped, we really needed to work more efficiently,” explains van Damme.

Another complication YourSurprise faced was highly variable demand, particularly as the company spread into new countries with different holiday seasons.

“For example, Father’s Day in Western Europe is completely different than in the Nordics, so May and



The Shuttleworth conveying lines installed at the YourSurprise distribution center utilize innovative Slip-Torque roller technology to ensure gentle product handling and no human contact with the conveyed products as they travel to their packing stations.

June are very busy months,” van Damme points out.

“Then there is the winter holiday season, when approximately 40 per cent of everything that is sold is shipped during the last six weeks of the year.”

Adding to the challenge was the fact that YourSurprise was dealing with multiple shipping companies in different countries—creating a massive struggle with sorting packages.

“Our whole production line went smoothly until we got to the bottom link at the end-of-line process,”

recalls van Damme. “We had a lot of packages that had to be shipped to many different countries—a process that is generally prone to mistakes.”

Sending out thousands of orders daily, human error was causing a significant amount of lost profits.

For example, a T-shirt order packed and ready for shipping had to have its shipping label manually checked by an employee to determine what method was going to be used to send the parcel.

The employee would then decide what lane or tray



to place it in for shipping. If the worker placed it on an incorrect pallet, it would never reach the customer.

“So a DHL-labeled package mis-shipped via UPS would be shipped right back to us, and we wouldn’t know where that package was because we really didn’t have an effective track-and-trace system in place,” van Damme recounts.

“Our system of manual workflow often made it difficult to know whether a product had even been entered into the fulfillment line in the first place.”

Like many other fast-growing e-commerce businesses, YourSurprise saw increased value in automating parts of its process in order to maximize throughput, while also minimizing shipping error and product.

“We needed to build a factory, and it was necessary to mechanize and automate as many of our processes as we could,” says van Damme. “But we still wanted to maintain the same ideals and principles of personalized attention to our customers that we started with.”

Automated pack-and-ship fulfillment for e-commerce requires conveyor systems that provide precision product placement and routing.

Although traditional flat-belt conveyors can deliver some degree of precision placement, they are a poor choice for managing product accumulation, such as is required for staging and spacing delicate gift products into automated packing and labeling systems.

The result is product jam-ups, product damage, misfires on wrapping, wasted packaging materials such as



Measuring over 2,000 linear feet, the Shuttleworth conveying systems installed at the YourSurprise fulfillment center are equipped with various blade stoppers, partitioners, product positioners, turntables and other accessories to ensure smooth product flow and flexible speed control at all the key product transfer points.

shrink wrapping film, and resultant line slowdowns and cessations.

In 2017, representatives from YourSurprise were at an expo in the Netherlands when they met team members from **Shuttleworth**, a leading designer, manufacturer and integrator of conveyor solutions, to see if they could resolve company’s material handling challenges. (www.shuttleworth.com)

Specifically, they focused their attention on conveyor systems that can accumulate, flip, stack, rotate, push, di-

vert, or index products for manufacturing or packaging processes, including e-commerce fulfillment.

“Shuttleworth invited us to look at a project they had recently installed at a plant near ours, where we could see their technology in operation,” says van Damme.

“They guided us every step of the way by suggesting what would suit us and our operation the best, and what would fit into our budget and timeline and predicted growth,” van Damme relates.



“In September we gave the approval to install the equipment and by then they had only had about six to eight weeks to get up-and-running.

“We had the entire system done, installed and in use by the end of December.”

Focusing on Shuttleworth’s *Slip-Torque* roller technology, more than 2,000 linear feet of ‘smart conveyor’ system were installed at the Your-Surprise factory.

The *Slip-Torque* technology is very interesting by virtue of utilizing individually powered, stationary rotating roller shafts covered with loose, segmented rollers, which become the conveyor surface.

It is powered by a continuous chain to control the drive force of the conveyed gifts, so that whenever the products stop on the surface of the conveyors, the segmented rollers beneath them also stop—generating low back-pressure accumulation and minimizing product damage.

With this approach, it is the weight of the gifts being conveyed, combined with the coefficient of friction between the shafts and the inside diameter of the rollers, that provides the driving force. As the weight of the products increase, there is a corresponding increase in the driving force supplied.

The Slip-Torque’s low line-pressure provided throughout the continuous-motion accumulation conveyors at YourSurprise allows for precise product placement on the conveyors, while it continues to take product flow from an upstream line for a period of time, whereas other conveyors would have stopped well before.

A low-pressure accumulation buffer, called **Dynamic Accumulation**, absorbs irregularities in the production flow to provides a smooth, even flow on the line, while the FIFO (first-in, first-out) accumulation maintains chronological order as items move along the line.

“The Slip-Torque is perfect for us because it exerts exactly the right amount of pressure on the little gifts that we sell,” explains van Damme. “We can transport really thin envelopes without any problem, and that’s really important for us.”

The conveyor system at YourSurprise is designed to carefully transport gifts ranging from one to 40 centimeters in length (0.39 to 15.7 inches), and weights ranging from 50 grams to 20 kilograms (1.8-ounce to 44.1 pounds).

“The accumulation capability where products are not jamming is also a big factor, especially in the sorting area,” notes van Damme. “We don’t want the delicate products being marred or damaged by the ones coming down the line.”

The system allows the same conveyors to be split into multiple, independently-operating lanes if desired.

For example, the middle lane can accumulate, while at the same time the right lane and the left lane can both convey, or even run in opposite directions.

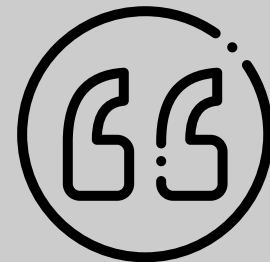
Each lane can act independently, but is powered by only one common motor, which also reduces energy costs.

The YourSurprise conveyors have the ability to modulate the speed of different sections of the conveyors via a central control PLC (programmable logic controller) and HMI (human-machine interface) terminal.

As products are moving down the line, the rollers at the back end of the conveyors can be moving faster than the ones at the front end of it.

With this set-up, YourSurprise’ fragile gifts can be moving at variable speeds on different sections of the conveyors as dictated by throughput requirements.

This controls the product spacing on the conveyors, keeping the



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fragile items separated and equally spaced from each other to minimize product contact, facilitate infeed into packaging and labeling equipment, and ensuring smooth transitioning into shipping diverts.

The conveyor system also minimizes product contact while steering products into desired locations, such as employing rollers with herringbone patterns to orient products without the use of guardrails, or setting up a series of sequentially smaller roller heights to direct the gift products into the center of the conveyor for packaging induction, without touching any other conveyor parts.

Motorized rollers with tapered corners are also used to maintain product orientation, gently and safely, as it is transported through 45-degree and 90-degree conveyor turns.

Because of the unique features of *Slip-Torque* rollers, the conveyor system is a safe environment for YourSurprise workers that work near and interact with the products being carried on the conveyor system.

The roller contact surface is designed to stop immediately if a hand is placed on it, thus maintaining a safe working environment.

Throughout the 2,000 feet of the smart conveyor system at YourSurprise, various product control devices have been installed to bring a much higher level of positioning accuracy with more positive product handling, including:

- Blade stops and brakes that enable on-demand stops and starts of production flow;
- Lift-and-transfer, lift-and-rotate, side transfer and turntable devices used to provide a smooth and accurate product transfer at a 90-degree angle to the original transport direction, or to change the orientation of products on the conveyors. Also for shipping diverts to route orders into specific shipping lanes for consolidation, lift-and-transfer devices were installed to scan and sort packages;
- Product positioners to accurately position products for a particular process;
- Pushers to move products perpendicularly from one conveyor traffic lane to another traveling in the same or the opposite direction, into or out of operator workstations or off of the conveyor system completely;

- Single-row combiners to efficiently combine products in multiple lanes into one single row.

“The system has the capability to identify the different types of products that we are moving through the system, and where they are in the system,” points out van Damme.

“Each order, and all products associated with the order, is assigned a license plate, which is scanned at locations throughout the system so the exact location and status of all orders can be viewed in real time.”

In the case of commination orders where more than one gift is being combined in a singular shipping package, the system knows to hold those products in a buffer zone until all items have been accumulated, and only then will that order be released for packing and shipping.

The YourSurprise order line starts with the consumer, who visits the company’s website and orders a gift.

This gift is then released into production for personalization, where it automatically loads into a personalized gift editor that adds a name, brand, text, photo or logo, with all personalization of gifts done in-house at YourSurprise.

Once the order is placed, the gift is printed within five minutes and automatically routed through the fulfillment line—order consolidation, packaging, labeling, and designated shipping lane.

“The entire system is integrated into one smooth operation,” explains van Damme. “We have a lot of fragile goods so it’s very important for us to have a system that detects that, and can react accordingly, with motion sensors located throughout every part of the fulfillment process.”

“The final system components were installed into our new facility in November of 2019,” says van Damme.

“Since then, we have reduced our order error rate by more than 60 per cent, while maintaining 100-percent accuracy with correct carrier assignment for shipping.

“The final scan at the end of the process gives us certainty that a gift has been produced and has been sorted out to the right carrier.” 🍁