

Drive & Control profile

Bosch Rexroth Chain Conveyor for Cookies



The VarioFlow chain conveyor from Rexroth does not need any cure wheels, since the bearing is integrated in the curve.

Every day approximately 20 tons of shortbread cookies leave the United Biscuits factory in Zaandam, Holland. These crumbly cookies must be transported very carefully, even in their boxes. VarioFlow, the chain conveyor from Rexroth, comes with chains up to 130 feet long, which safely transport the cookies from one packaging machine to another.

Food production makes special demands on technology. This applies

even when already packaged cookies are transported in the factory. Jan Esselmann, system technician at United Biscuits' plant in Zaandam, knows about all these problems. He has spent 17 years trying to figure out the best way to transport packaged cookies and snacks between individual production stations. "You can't avoid crumbs when making and packaging cookies, which creates special transport problems."

Challenge

Build new shortbread production conveyor to move packaged cookies and snacks between workstations cleanly and more efficiently

Bosch Rexroth Solution

- Bosch Rexroth VarioFlow chain conveyor

Benefits

- Modular platform supports three package widths within single system
- Open system design makes maintenance and cleaning much easier
- Symetric side profile mounting lengthens chain lifespan
- Single 40 meter-long conveyor section satisfies unique production requirements
- Patented ball bearing reduces rolling friction and improves operator safety on curved sections

The timing was perfect to exchange the old packaging machines and chain conveyor system for cutting-edge technology and simultaneously automate the final packaging process when the company moved its shortbread production facility to Zaandam, northwest of Amsterdam. In order to comply with space limitations in a factory that is over 100 years old, a special project group planned the new system layout. “We didn’t move production to the industrial area on the outskirts, which means we had to calculate very carefully how to best use the available space in the factory in the city,” emphasizes Esselmann.

Long sections, various widths, and little maintenance

The group came up with three essential criteria during their



In some section, the conveyor section looks a bit like a roller coaster. United Biscuits uses various widths depending on the package. The 3 in. chain for individual packages and 6 in. for triple packs are able to run so close next to and below each other because of an integrated bearing in the VarioFlow.



Boxes with individual packages of cookies are conveyed on a 12 in. chain that is also part of the VarioFlow program. Implementation of such a radius directly after a packaging machine is possible without a curve wheel thanks to an integrated bearing.

search for just the right system: long conveyor sections, various chain widths all in one program, and little effort necessary for maintenance and cleaning. “These three were really the most important requirements, and the VarioFlow chain conveyor system from Rexroth meets them all,” confirms United Biscuits’ system technician. Working together with Rexroth the company was able to set up the new conveyor in just a few months time.

Shortbread production is spread out over two levels in the factory. The cookies are baked in an oven in the upper level and are then sent on 5 foot wide chains through a cooling system. Packaging takes place down on the lower level. Here, 250-gram boxes are sealed in plastic individually or in packs of three, and then transported to where they are placed into larger boxes for shipping.

Rexroth’s VarioFlow chain conveyor system transports these three

different-sized packages. United Biscuits uses three chain widths— 3 (single packs), 6 (triple packs) and 12 (boxes) inches for this task. “It was a big advantage that we could get all three widths from just one modular system,” explain Esselmann. The system technician also notes a variety of additional pros in terms of system planning and later conveyor maintenance, “The entire system is made up of components that vary very little, which reduces stock of spare parts. Plus, the chain links are just plugged together so that we don’t need any special tools to open or modify a line.”

An open system requires minimal cleaning

A long-term employee at the cookie factory, Jan Esselmann especially likes the open system construction. “Although the cookies are already packaged before they reach the conveyor, there is always the chance crumbs will fall on the conveyor. Of course, this is all considered production waste, but it could quickly cause the chain to glide less smoothly.” VarioFlow does not have any profiles in the middle, which makes the system almost completely open and lets the crumbs fall through. This means the system stays clear of debris longer, requires less cleaning and parts do not have to be replaced as often as with closed systems.

The conveyor’s construction is not the only reason that makes VarioFlow so long-lasting. Slide profile mounting is also a contributing factor. Instead of more customary mounting with



VarioFlow manages a lengthy section with just one drive.

screws inserted from above, the symmetric sliding profiles in the VarioFlow system are fastened on the sides. “The benefits of this method are really obvious in our maintenance costs,” adds Esselmann, “since we can simply turn the profile around when it’s worn out and continue to use the other side.”

A longer service life is an important criterion for the innovative curve technology used in VarioFlow and a patented ball bearing is integrated into all the curves. The resulting rolling friction lowers wear compared to normal sliding friction. Esselmann also recognizes yet another advantage with this bearing, “Common systems that have a curve wheel would mean that we would have less room on the inside of the curve. Our employees often came too close to the curve wheels, so we considered this solution critical in regard to safety. Safety problems like this don’t even appear with VarioFlow.” The integrated ball bearing also forms the technical basis to implement curves with larger radiuses.

130-foot section with just one drive

Additionally, the project managers had to take into account the different sized packages that would be conveyed on chains with various widths to a variety of packaging machines. The result is a system very much designed like a roller coaster in some sections. Besides

shorter, curvy sections, United Biscuits also needed a very long 130-foot section. VarioFlow managed this lengthy distance with just one drive.

“This is the longest section we have here,” reports Esselmann. “We need it to reroute the packages to manual packaging workplaces in case there are any problems with the packaging machines. We can do this easily with VarioFlow, whereas other system manufacturers wanted to split up this section.” The circulating chain is actually 260-feet long. Thanks to the integrated bearing, it is particularly stable, even with five vertical curves.

Absolutely convinced by a perfectly running system, Jan Esselmann is confident about future system changes, “This system is so flexible, thanks to its special construction, chain links and easy assembly. It won’t be a problem to change the layout later if needed.” Until that time, 20 tons of cookies will continue to run on VarioFlow daily.

Rexroth
Bosch Group