

The benefits of overhead conveyor systems

By Campbell Davie

Whether it's a new manufacturing facility or an existing structure that's been functioning for years, plant floor space is nearly always at a premium. Besides needing room for equipment and product flow, processing and packaging management needs to plan for safe and efficient personnel and forklift movement.

The task may sound a simple one, but optimizing productivity can sometimes lead to crowded machinery and traffic jams, where aisles are too tight or poor flow creates bottlenecks. And that means lower efficiency and a greater risk of accidents related to workplace congestion.

One way to open up the plant floor is to move conveyor operations up and out of the way—i.e., overhead. Overhead conveyors maximize available square footage, improve personnel and lift truck flow, and create layout and construction options that are not available with ground-level systems or by moving product manually.

In a new plant, that could mean reducing the facility's footprint, which lowers construction costs (it's almost always less expensive to go up than out). In an existing facility, it might mean the difference between knocking out walls or simply using existing air space. In either case, overhead conveyors provide greater design flexibility.

Overhead options

Overhead conveyor options vary by application. Each is product specific, but with a range of variables, including the type of chain and the method used to elevate the product. Chains may be plain, cleated, friction-top or roller-top, depending on each conveyor's particular job within that application.

The elevation method similarly depends on the product being moved and can range from a simple, gradual incline conveyor or with a cleat to hold the item in place to a wedge conveyor that grips each piece and can carry an item straight up at a 90-degree angle to the floor.

In general, elevation conveyor types are as follow:

- * Cleated. On cleated conveyors, gravity pulls the product back into the cleat pocket as it inclines. A variety of cleats, including rollers, keep the item in position.

- * Alpine. A series of switchbacks that gradually rise, alpine conveyors not only move product upward, they provide inline buffering for high-throughput applications.

- * Elevators. Fed by conveyors on the ground, elevators lift a product vertically to the top level where it is pushed off onto a horizontal conveyor that transverses the specified area, carrying the item to the next

station. Elevators are generally used for lower volume applications where speed is less critical.

* **Wedges.** Wedges consist of two conveyors facing each other. As a product feeds into the wedge, the conveyors come together and clamp onto either side, carrying the item up, over and down. Wedges are fully adjustable with a hand crank to provide quick changeover and flexibility for multiple product sizes. The product and how it needs to be gripped dictate the type of chain, but wedges can carry anything from aerosol cans to auto parts to glass bottles to rolls of paper towels.

For proper guidance of conveyed products, FlexLink's modular Automatic Guidance System (AGS) provides flexibility to overhead conveyor applications. The AGS consists of linked guide units, junction boxes and a control box. The control box, set on the plant floor, communicates with the guide units to adjust the conveyor rails overhead. So, for example, an end user can drop from a 14-inch width to a 7-inch width at the flip of a switch. The system is simple and scalable to any operation.

One example of a FlexLink system in action: a plastic bottle manufacturer supplies a personal care goods manufacturer located on adjacent plots. The supplier, with FlexLink's assistance and its customer's cooperation, created an overhead conveyor system that takes boxes of empty plastic bottles from the fabricating operation, lifts them over the plant floor and transports them along an enclosed bridge connected to its client's facility.

A ground-based conveyor system running from one building to the other would not only require more room in the bottle maker's facility, it would block traffic between the two buildings, since they would be physically connected on the ground by the conveyor. Alternatively, moving pallets of bottles via forklift would create excessive traffic, require much more labor, be slower and less efficient, and create potential safety issues.

Systems can be equipped with a variety of drive units, idler units, side rails, corner bends, rail brackets, diverters, combiners, buffers, accumulation options, turning options and "policemen" to regulate traffic. Conveyors work in conjunction with printers, cartoners, palletizers, depalletizers, robotic arms, inspection systems and other equipment.

Answering questions

Despite their space-saving advantages, the prospect of overhead conveyors also raises some logical questions. Will it stress the building's structure? Are they more difficult to install and service? Are they more costly than on-ground conveyors? Is there any danger of product falling off?

The need for structural reinforcement depends on the type of conveyor installed. Steel conveyors may require additional ceiling support.

Aluminum conveyors, like those manufactured by FlexLink, are lighter weight and usually require no extra support systems. In one FlexLink installation, five conveyor lanes (fed by depalletizers) proceed side-by-side up and through a single structural support. The configuration required no additional structural modifications.

Assembly costs may run slightly higher than ground-level conveyors, because the work is being performed in the air with cranes lifting material and workers. That simply takes more time than ground assembly. But the overall duration of construction depends on the application and the type of overhead conveyor selected.

FlexLink overhead conveyors in particular offer some advantages over competitive systems because they are put together almost modularly, somewhat like the concept behind an Erector Set. The company's design uses threaded rods and clamps that attach directly to ceiling beams. And, again, because the pieces are aluminum, they are less cumbersome and easier to move and position than steel systems.

In terms of servicing, control boxes are located on the ground for easy maintenance and operation. Changing chains does require additional time because it could necessitate lift work.

Side rails and optional mesh safety netting ensure that no product falls to the floor.

Many times, conveyors are the last item chosen when creating a packaging line—its seems almost like an afterthought. Plants could make better use of space and create more efficient operations if they incorporated conveyor design—particularly overhead conveyors—earlier in the process. Productivity suffers without sufficient consideration for conveyor lines.

FlexLink is an expert at complex layout, design and automated execution control and recording of the flow of products in manufacturing processes. Many times it's best for a product to go from here to there not on the ground but in the air.

For More Information Contact:

FlexLink Systems Inc.
6580 Snowdrift Rd.
Allentown, PA 18106
Telephone: 610-973-8200
Fax: 610-973-8345
Email: paul.jarossy@flexlink.com or campbell.davie@flexlink.com
Web: www.flexlink.com
