

COMPARING TRACK & CONVEYANCE SYSTEMS

KEEP THE THROUGHPUT, REDUCE THE FOOTPRINT

Both track-based systems and conveyor-based systems can shuttle materials from point A to B... but why choose one over the other? Environmental factors, desired machine footprint, and application requirements such as speed and precision all play a role in the decision process.

Track systems can be designed to maintain a high speed and throughput while using a small footprint. For example, an oval-shaped track system can have machines stationed on the inside of the loop, as well as outside the loop and above it, all processing material simultaneously.

Track systems also excel whenever material handling must be highly controllable or precisely indexed. They offer flexibility to configure packages into a variety of orientations and shapes, and their versatility allows them to fill multiple roles beyond material handling (such as regulating product spacing, or performing operations alongside moving products).

CONVEYANCE SYSTEMS

- Ability to load products anywhere along the conveyor without knowledge of what is loaded
- Simplest means for discharging product
- Good for long, unidirectional movement
- Can be unpowered, as in gravity roller conveyors

TRACK SYSTEM

- Smaller turning radii make it easier to design track around process without wasting space
- Self-cleaning vee guide wheel technology
- Easier to install as a complete solution
- Highly controllable motion profiles
- Higher accelerations, more rigidity, and speeds up to 4 m/s (over 13 ft/s)

Bulk Material Handling

With bulk materials, operations are performed on loose batches of product before primary packaging. These processes typically operate based on weight and volume, and position precision is not as important.

Augers, belt conveyors, and bucket conveyors are often used to move bulk materials for high throughput. However, track systems can shuttle product in buckets as well. This can be done either with a horizontal track loop, similar to a train and train cars, or with vertical track loops, as seen in the image to the right.



Parallel, vertically-mounted HepcoMotion® DTS track systems from Bishop-Wisecarver carrying buckets.

Precision: Indexing with High Throughput



HepcoMotion® DTS from Bishop-Wisecarver® with position-lock option for added precision.

What if a higher degree of precision is required? Multi-step processes may require indexed motion that is highly repeatable. The machine may stop at intervals to perform scanning, labeling, filling, assembly, or other operations.

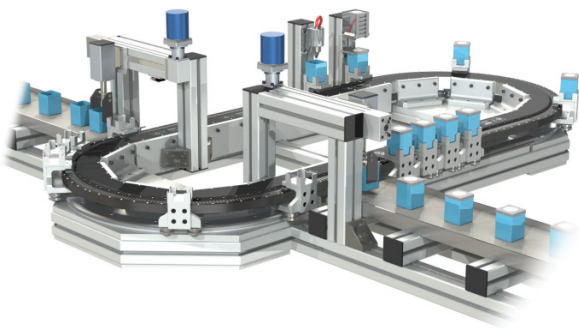
Belt, motorized roller, and chain conveyors are popular solutions here, but often require other mechanical elements to ensure correct positioning and spacing. Additionally, because of the tracking and slipping issues that conveyor systems are prone to, monitoring systems must be robust. With these added pieces of equipment, the system can become very large and eat into valuable production space

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Track systems are well-suited for indexing applications for three main reasons. First, the spacing between carriages is either fixed and consistent (in the case of belt or scroll drive tracks) or highly controlled (through linear motors). Additionally, such systems are capable of high accelerations, ideal for the start-and-stop of indexed processes. Finally, rack systems have higher rigidity than conveyors, since the guide wheels are precisely mounted to the track. This allows the systems to take greater force and moment loads at and between indexing locations.

Versatility: Complex Operations and Multi-Product Handling

Sometimes it is possible to have multi-product handling on a single line, to conserve space. However, system complexity instantly multiplies. Products or packages must be transported in a controlled manner, with full knowledge of how the variety of products impacts the process. An application may involve variable timing on a single operation, multiple operations with different timings, or multiple products on a single line.



HepcoMotion® GFX track performing multiple operations. The linear motors and durable vee guide wheels support high speeds.

Individually motorized roller conveyors with variable speed and acceleration are one way to add flexibility when it comes to accumulation and multi-stage processes; though the level of control and precision of these conveyors is limited.

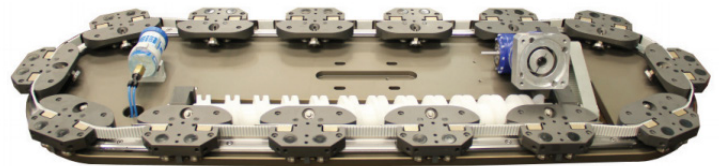
It is possible to get greater precision and flexibility, with an even smaller footprint, using track systems with linear motors. Systems such as the GFX (shown to the left) have independently controlled carriages that travel at speeds up to 4 m/s. These highly versatile systems allow for on-the-fly product changes. They also improve throughput by reducing the effect that slower operations have on faster ones.

Resilience: Debris and Moisture

Whether dealing with washdown cycles, packaging dust, or industrial debris, environmental conditions influence machine design. Chain driven conveyor systems fare the best in debris environments. Belt conveyor systems can carry debris with them, getting dirty or sticky over time.

Track systems with vee guide wheels excel in contaminated environments, since the motion of the vee wheels on the vee track creates a self-cleaning action that wipes away debris. Timing belts and scroll drives are both suited for these conditions, though scroll drives may cause static effects.

Washdown cycles can cause corrosion unless the conveyor or track system is made with stainless steel, aluminum, and polymer components. For example, the DTS2 system to the right uses stainless steel wheels and track and a food-grade polymer scroll wheel.



DTS2 using a food-grade polymer scroll wheel.

Summary

Applications requiring simple movement of goods realize the most value from conveyor systems. However, when your application requires curves, process stops, a minimal footprint, debris is a factor, or if increased flexibility and precision are needed, then track systems that utilize vee guide motion technology will provide the very best value.



To learn more about curvilinear tracks systems in packaging, as well as view example application stories, scan the QR code to the left.