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Technical Article
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Lightweight Belt for Unit Handling Systems

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Unit handling systems encompass a broad range of applications and market segments. One could almost say that any conveyor moving an item from Point A to Point B could be considered a unit handling conveyor. Today, conveyors used in warehousing, distribution centers, and baggage handling systems have come to define unit handling applications.

The systems involved in unit handling applications are typically computer controlled. Through the use of an appropriate software package, signals are transferred to the individual conveyors so they can perform their respective tasks. Throughput is the number of units that can pass from start to finish in a system over a given period of time, typically one hour. Throughput rate is the amount of product selected, conveyed, sorted and shipped in a given period of time. The systems are designed around the throughput rate.

Throughput rate typically relates to the speed with which items travel from start to finish. As systems run faster and faster, there are more challenges in the selection of conveyor belts. Here is a partial list of things that must be taken into consideration in the belt selection process:

- High speeds
- Noise levels
- Flexibility
- Joining/Splicing
- Flame retardance
- Chemical resistance
- Tracking
- Elongation
- Coefficient of friction
- Static conductivity
- Cut/Gouge/Abrasion resistance

In a typical unit handling application, a large number of items are fed to the input end, with the objective being to send them to many diverse locations on the output end. Let's review some of the applications involved in getting this accomplished.

At the input end, items are selected based upon orders. The conveyors involved in the selection process can be rather long and carry a lot of weight. These conveyors will generally be either slider bed or roller bed.

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Product then passes to a pre-merge accumulation area. There will be many conveyors where product is stopped, held, and released as required to keep a constant flow of product moving through the system. For stable product (e.g., in cartons), live roller systems may be used. For less stable items, belt conveyors may be used.

The pre-merge conveyors feed onto the merge conveyors, which are the primary collection points for all infeeds into the sortation process. Multiple pre-merge conveyors will feed onto each merge conveyor. Merges will generally be belt conveyors. Since our objective is to have products from numerous infeeds "merge" into a single line, we would use belts with low coefficient of friction top surfaces to allow sliding.

The merge conveyors will feed onto induction conveyors, which are used to create gaps between items and to bring items up to sortation speed. The use of belts with a high coefficient of friction will provide the positive grip required for acceleration/deceleration.

Next comes the sortation process. This is the actual point where products are "sorted" and sent to the appropriate shipping location. Either roller bed or belt conveyors can be used in this application. When belts are used, low coefficient of friction surfaces are generally favored because product is typically diverted off the belt, and needs to slide easily.

After the product is sorted, it is fed onto a takeaway conveyor. This conveyor generally runs faster than the sorter belts to move product away as quickly as possible.