

DISTRIBUTION AND MATERIALS HANDLING FOCUS

In part 1 of this article series, we discussed advances in conveyor design including modularity, flexibility, speed control, and maintenance.

Accompanying that article is the first of a new SCDigest/Distribution Digest series of analytic publications, which we call a Materials Handling Tech Note. These will be a series of ongoing research notes that look at various aspects of the materials handling and distribution market and practice. The first one looks at how recent changes in conveyor technology from leading providers have **made today's systems much more flexible** than in the past. It can be downloaded here: [Materials Handling Tech Note: Advances in Conveyor Technology increasing System Flexibility](#).

In part 2, we look at how advances in conveyor technology are improving system adaptability and performance.

Integration with Other Technologies

Conveyor networks that are tightly integrated with voice or light directed order fulfillment systems are providing improved overall system performance. If a voice or light directed system can be linked with the conveyor controls through the WCS, then the picking/shipping container can index through the picking system automatically.

Ken Ruehrdanz at Dematic says that this configuration accelerates the picking process, and is an example where the conveyor sub-system and the real-time fulfillment sub-system



Cliff Holste, Materials Handling Editor

operate more productively when integrated into one unified system.

More examples can be found in the recently published [Supply Chain Digest Automated Case Picking](#) report where we describe several different types of systems that include a variety of equipment, controls, and software technologies to produce fully integrated solutions.

Integration is the key to obtaining robust system performance. When sub-systems are networked together, critical performance and operational information can be collected and exchanged in real-time so that any abnormalities or faults can be systematically reported and resolved. In other words the right hand knows what the left hand is doing.

New Developments in Motor Driven Roller Technology

As could be seen at ProMat 2009, Motor Driven Roller (MDR) technologies, in which low voltage (24vdc) motors for driving product are actually contained within individual rollers, or in the case of Hytrol mounted on the outside of the conveyor frame, are gaining favor. MDR conveyors allow for a good deal of design flexibility, as the power and intelligence are self-contained within small conveyor sections.

Although MDR equipped conveyors cost more than conventional live roller conveyors, according to Kevin Klueber, Product Manager, Intelligrated/FKI, they are a lot less expensive to install and maintain, and with their lower

energy consumption they cost less to operate, which can lead to long-term savings.

Jim Evans, Customer Service Manager, HK Systems, said that based on customer reports MDR conveyors are providing significant additional energy savings in the +50% range by operating only when product is available for transport. As a container approaches the zone, the motorized rollers activate to carry it forward to the next zone. If no other containers are present, the zone turns off.

MDR is generally not considered to be a replacement for long runs of transportation conveyor over 100 feet in length. For this reason, MDR tends to be used for applications that feed specific work zones like in zone picking areas, value added services (VAS), and inspection/packing workstations - areas where the conveyor can run intermittently.

MDR speeds are increasing as the technology improves and are approaching 300 FPM with unit load capacity comparable to conventional AC powered conveyor. Some manufacturers are offering high torque MDR capable of transporting pallet loads in the medium weight range.

The invention of motorized roller conveyor has led to the development of a second kind of belt conveyor being offered by a few of the major conveyor manufacturers known as segmented belt conveyor. A section of segmented belt conveyor is essentially a section of motorized roller conveyor with a few feet of belting wrapped around each zone of rollers.

According to Ruehrdanz, segmented belt conveyor combines the accumulating power of roller conveyor with the stability of belt conveyor, resulting in excellent control of assorted



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carton sizes and shapes as well as poly bags, plastic blister packs and clam shells. The photo on the next page shows the Dematic Segmented Belt on roller conveyor module.

Where Is Conveyor Technology Headed In The Future?

The experts interviewed for this report agree that conveyor systems will continue to get more automated and more efficient. We may see a greater reliance on composite materials not only

for bearings and drives, but possibly for the conveyor structures themselves. Escalating steel prices and energy cost may eventually result in plastic conveyors that will be more modular, adaptable and will also be quieter to operate.

For example, we are already seeing some of that with the integration of specialized conveyors like **Activated Roller Belt™** technology as provided by Intralox, which offers de-scramblers and alignment units that can be integrated with automatic depalletizers and perpetual merge units that can feed sortation conveyors.

Phil Kaffenberger, Vice President Engineering, HK Systems, says that HK is beginning to see a trend towards smaller, more regional DCs which they believe is being driven by escalating fuel cost. These smaller DCs will operate in the 80 to 140 cartons per minute range and require automation designed to closely

match their requirements.

Fitting Big Flexibility into a Small Space

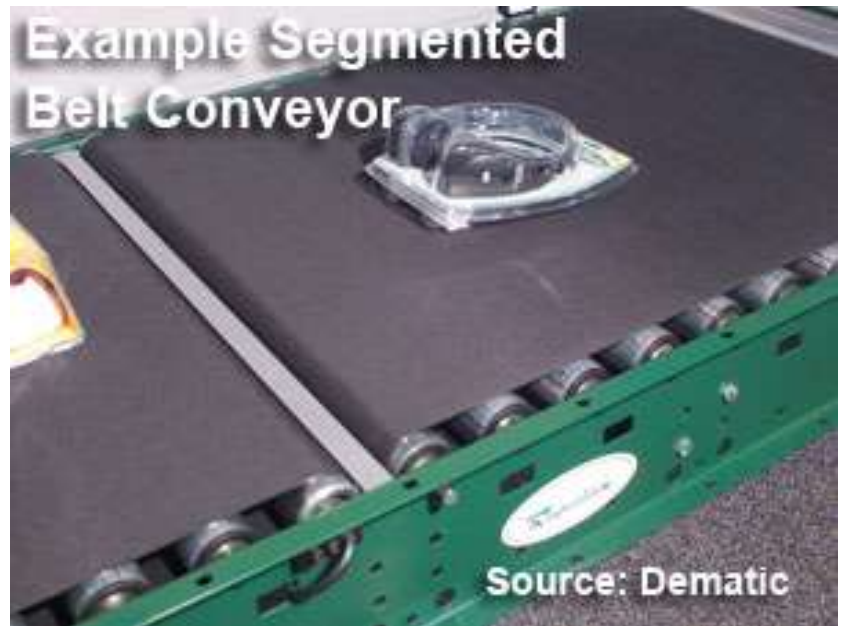
A good example of closely matching automation to requirements can be found in a project that Intelligrated did at Hershey's facility in Pennsylvania.

Up until a few years ago, products were hand-palletized, resulting in low palletizing rates and high manual labor costs. "We had three to four people palletizing per line, per shift, for three shifts a day," says Alex Diaz, Packaging Systems Engineer. "So we're talking about 12 to 15 people palletizing at once, depending on how complicated the patterns were." Employees were also doing a lot of heavy lifting – some boxes in excess of 50 pounds – leading to ergonomic issues and safety concerns.

All of this manual handling resulted from the need for constant change. In addition to relatively high velocity brands, there is a wide variety of low to medium velocity products that can change seasonally, weekly, and even daily based on demand from the Hershey marketing team, retail stores, and consumers. However, driven by the need for faster and more flexible palletizing, Hershey engineers knew it was time to make the switch to an automated system.

Hershey assembled a project team and quickly realized that a combination of robotic and conventional palletizing was the best solution to meet Hershey's sales and operational requirements, especially given the limited floor space of 7,000 square feet that was available.

Intelligrated, acting as Hershey's Systems Integrator designed an automated system solution that sorts mid to high velocity products to an Alvey



780 case palletizer, and low velocity product to one of three Motoman EPL 160 jointed-arm robotic palletizers (technology new to this facility).

Without shutting down production, the entire project was installed and commissioned in 2 months.

How has the new process worked out? Since system startup, Hershey has seen a reduction in its labor requirements and an overall improvement in throughput and processing efficiency. The project has been a big success for Hershey. Diaz says he learned a lot about adapting to new technologies and being prepared for future change.

"Basically, nearly everything you plan has changed by the time you implement it", notes Diaz, referring to the constant packaging changes he faced during the project. "Change comes quickly, and you have to adapt to it as quickly as possible to be successful."

Final Thoughts

Going forward conveyor systems will not simply connect pieces of equipment; they'll be the glue that holds them all together. It's easy to get caught up in all of the system graphics that allow you to get "inside" the system as though it were some type of SIMS game. However slick the equipment and visual displays maybe, what really counts is how closely the system operation mimics, supports, and enhances your operation.

While system price and ROI are important consideration, an inexpensive solution that falls short of satisfying the above conditions, is no bargain. A really great system solution will be the one that can adapt to changes, and ten years down the road will still be a "what would we ever do without it" asset.

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