

Manufacturing Innovation Insider Newsletter

Modular Conveyor System Expedites Production Changeovers, Enhancing Automation and Design Build Possibilities - at Lower Cost

Advanced, modular conveyor systems integrate with other agile manufacturing systems to help manufacturers achieve zero-defect quality while gaining the ability to reconfigure systems, thereby speeding changeovers and boosting ROI

In the automotive world, where change is the name of the game, one of the foremost imperatives is to ensure that manufacturing changeovers can be made quickly and accurately. While the acceleration of product development and production are important missions in many sectors, in the auto industry they are momentous, and may very well decide the viability of suppliers.

The front end of this work - the design and engineering of productive plant facilities - is continually improving. Yet, there are sometimes major problems getting production equipment into operation efficiently. This is especially worrisome when reconfiguring one or two elements of a production line creates unforeseen delays or results in equipment replacement costs that cannot be passed on to customers.

One facet of the production line that can present both problems - protracted reconfiguration delays and exorbitant replacement costs - is the conveyor system. This is particularly the case with the fixed-length metal conveyor, which in recent years has lagged behind in reconfiguration flexibility and in ROI has been the conveyor system. Today these problems are quite avoidable, due to the availability of highly flexible modular conveyor systems.

To some extent, the flexibility of “truly modular” conveyor systems provides an internal design build capability; that is, the engineer can adapt the conveyor system to his design requirements. The antiquated options, adapting a production line to make use of existing conveyors, or ordering expensive new equipment (and adding to the conveyor boneyard) are rapidly becoming unacceptable.



All four GW Plastics plants are standardizing utilizing DynaCon box filling and incline conveyor.

Today’s manufacturing systems are designed for high-performance output within specific quality parameters. This often entails achieving zero defects through highly customized, integrated and automated equipment. Those systems become agile and provide a major competitive boost when they can be quickly and easily reconfigured to handle changes ranging from product modifications to entirely new setups.

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“Most of our projects have a three-to-four year lifespan,” says Matt Barta, Manufacturing Engineering Manager at the Tucson, AZ facilities of GW Plastics, a supplier of automotive, healthcare, industrial and consumer products. “We have a lot of money invested in our automation cells, so we try to buy equipment that can be reconfigured for other applications. That includes our conveyor systems. Even though the equipment wasn’t purchased for a future application, being able to reconfigure it means it won’t be pushed into a corner when we retool. It can be redesigned, taken apart, expanded - whatever we need. We can reconfigure them quickly and easily, and that gives us a much higher return on investment.”

Material handling via flexible conveyor systems is of increasing importance to agile manufacturing systems is. Just as fabrication equipment becomes progressively more efficient and powerful through integration of robotics and other automated devices, many similar “intelligent” capabilities are being required of conveyor systems.

For example, at GW Plastics Tucson plant, Barta has undertaken a major insert injection molding project that requires the development of customized and highly automated molding cells. Three automation cells will ultimately produce 1.7 million plastic fuel pumps annually for a global automaker, beginning with 2007 models.

The flexibility of modular conveyor systems has become increasingly critical to success on the factory floor, where the ability to quickly and easily reconfigure complex production systems is providing a vital competitive advantage.

“These cells are very high-tech and very automated,” Barta explains. “There are numerous operations taking place to build the fuel pumps, including plastic and metal components. This requires the integration of several robotics and feeding systems. A modular conveyor system is the final piece of the automation.”

The conveyor system used in Barta’s project is the DynaCon® modular plastic system manufactured by Dynamic Conveyor Corporation, Muskegon, MI.

This line of light- and medium-duty modular conveyors quickly adapts to product changeovers, increases or decreases in production, line conversions, and more.

Manufacturers like GW Plastics have found that wherever flexibility is a key element of productivity, modular conveyor systems can make a big difference in costs and efficiency compared to fixed conveyors. GW Plastics aims for “minimal manpower” in their plants, particularly in the packaging area and DynaCon modular systems - their corporate conveyor standard - are bringing them closer to that goal, increasing production efficiency, and reducing costs.

Manufacturers with frequently changing production lines find that a truly modular conveyor system can not only help streamline and optimize production, but can also incorporate accessories that enhance quality and provide serviceability that increases uptime while lowering maintenance and replacement costs.

At GW Plastics’ San Antonio plant, DynaCon conveyors are saving up to \$72,000 in annual labor costs alone due to increased conveying efficiencies. Six box filling conveyors were installed in 2003 to automate the movement of newly molded seat belt and signal switch assembly components. The modular conveyors are up to 21 ft. long, equipped with Intralox modular plastic Flat Top belts and flights. Boxes load in the center of the conveyor, and when a cycle counter determines that the box is full, the conveyor indexes forward one box.

“We used to have an operator move boxes at the press every half hour or so, but now they only have to do that every eight hours,” explains John Brandt, Production and Engineering Manager of GW Plastics’ San Antonio plant. “That saves us about \$6,000/month in labor costs.”

“In Tucson we do a lot of cells on the conveyor to meet packaging requirements,” says Matt Barta. “We do automated packaging, sometimes where products are placed directly on conveyors in divided lanes and boxed-in cells. In one case, we had a vision system hooked up to one cell; we were doing inspections with convex cameras on the conveyors. We also use

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the reverse drive capabilities of the DynaCon system in combination with Cognex part separation technology. If the product is judged to be substandard, the conveyor will revert and the part will be removed to a location for rejects.”

Beyond the DynaCon product line including components and accessories that enable manufacturers to adapt to a variety of challenging situations, such as detecting foreign objects or mishaps on the conveyor line, visual inspection optical devices, cushioning the impact of items that must drop on the belt, and accommodating a tote stacking system, the greatest benefit comes from being able to reconfigure the system at will.

“With the DynaCon system, every time we had to reconfigure we would save the cost of getting a new conveyor,” says Larry Beer, Team Leader at Listowel Technology, Inc. (Listowel, ON), a supplier of plastic injected automotive parts. (Subsidiary of Moriroku Company Ltd.) “We had storage problems with our old metal conveyors. As we made changes in the plant, we ended up storing at least four metal conveyors because they would not adapt to what we wanted. We stored them for three or four years, which was costing so much that we ended up tossing them out. With the DynaCon system, if we need a conveyor that is a little bit longer, we just order a module and make it longer. Or I can take a module out to make it shorter.”

Beer says his group at Listowel experienced another surprising benefit of using a lightweight modular conveyor system. “We had an incident on a new line we put in, where a new DynaCon conveyor was damaged. Had the conveyor been metal, it would not have been repairable. We replaced the damaged conveyor section within an hour, at a cost of about \$300. If it had been metal, we would have been looking for a new conveyor.”

The modular design of the DynaCon conveyor system can be configured in many shapes and sizes, enabling companies to standardize a system by simply snapping selected modules in place, much like Lego® building blocks. Accessories and replacement parts

can be used interchangeably and modules such as S-turns, cooling tunnels, water baths, programmable box filling and variable-speed drives enables critical control of production flow for manufacturers.

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