

By The Numbers

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Conveying equipment can't just keep getting faster - it has to get smarter as well. Learn how market conditions, design elements, and maintenance issues work together to create positive trends in the conveyor industry.

Investments in critical equipment have been slowly creeping up in manufacturing environments, and conveying systems have certainly been no exception. The reason behind this may be, simply, that conveyor systems play a critical role in both uptime and efficiency.

“Conveying, in general, is a highly cost effective, safe, and environmentally sound method to transport large quantities of material as needed, and will remain the preferred method to achieve increased production goals in both bulk and unit applications,” explains Paul Ross, president of conveyor component producer Douglas Manufacturing and board member of CEMA (Conveyor Equipment Manufacturers Association).

According to the latest figures from CEMA, new orders for conveyor equipment in 2012 were \$1.31 billion more than 2011, representing an increase of 14 percent.

According to Ross, overall North American shipments were influenced by a sudden demand for product in the first half of the year. “This was driven by increased exports of bulk material handling components and systems into emerging markets where demand is high for a variety of raw materials including coal for power generation.” Other factors, such as the stabilizing of the housing and construction markets, also affected demand favorably.

Smarter, Not Harder

For material handling system integrators like Intelligrated, factors outside of the market have been influencing how they design conveyor systems. When it comes to users, says Intelligrated's Tim Kraus, concerns around downtime have meant that accumulators and sortation equipment along a critical path in a facility have been subject to the most changes in design. “When something on a critical path goes down, you wind up with employees standing around, waiting for it to be fixed,” Kraus explains. “So not only is the facility losing productivity, but often everyone has to work longer or faster or harder to catch up and meet what was expected (after the system is up and running).”

With this in mind, users are coming to their material handling equipment suppliers with a desire to make these systems on the critical path less prone to failure. “Systems are becoming smarter in gathering and reporting on data that can help

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the owner and the technicians predict the failure. Looking at a component life of a certain device or a motor in a system, tracking the cycles of that unit, and getting a better idea as to how close it is to the average failure of that particular component so that something can be replaced in a normal maintenance cycle rather than waiting for it to fail and causing system downtime," he says.

Other significant factors dictating design have to do with the changing workforce. With the Baby Boomers exiting in droves, the replacement workforce is sometimes working with a deficient skill set. "If you have a less skilled workforce that is trying to replace a workforce that's had a lot of experience, it makes it all the more important to keep things as simple and as automated as possible," says Kraus. He goes on to explain the balance required to both provide the system intelligence that the businesses need, while not requiring an unrealistic skill level to maintain them. "The challenge then," he explains, "is to really take advantage of that extra technology but, at the same time, simplify it and make the user interface as simple as possible so the increased level of technology doesn't introduce additional risk into keeping the system running."

Physics: Limitations

There once was a time where conveyor "improvement" simply meant getting faster in order to increase throughput. Now, says Kraus, "We've gotten to the point where the laws of physics are restricting that growth." Instead, companies like Intelligrated are forced to become more creative in the advancements of these systems. Kraus highlights the example of an accumulating conveyor — a piece of equipment that can only run so fast before you start to have problems with cartons accumulating on a conveyor or becoming damaged. "Now we need to find ways to be smarter about the way in which the system is controlled — so that it can run fast when it needs to, but it also can come to a more controlled stop, and items on the conveyor can come to a more controlled accumulation logic, so that we can increase the throughput without violating any of the laws of physics."

For CEMA, its concerns are less about the laws of physics, and more about the laws of the land — specifically, how legislation will affect conveyor equipment purchases into 2013. Ross cites "continued uncertainty" as a factor influencing business decisions around capital investments. "The level of overall construction activity, government spending on infrastructure, as well as continued demand for coal-fired power generation outside of the United States will influence spending on conveying equipment in 2013," he says.

Greased Up

Lubrication is one of the most important elements of a solid conveyor maintenance program. IMPO sat down with Tom Dibble, Plant Manager for Mighty Lube Systematic Lubrication, Inc., to discuss some common questions surrounding this critical area.

Q: How much lubricant should be used on a conveyor system, and how often should it be reapplied?

A: A number of factors determine how much lubricant and how often lubricant should be applied to a conveyor. These factors include type and size of the conveyor, load, type of lubricant, and environmental conditions. For example, a powder coating operation would likely have a conveyor running through a wash system and one or more ovens. The water and chemicals from the wash system, along with the heat from the oven, would remove the lubricant, sometimes requiring continual or daily lubrication. In contrast, a conveyor transferring parts through ambient temperatures would require comparatively infrequent lubrication, such as once per week.

The most effective method of conveyor lubrication is to initially set the amount and frequency of lubrication on the above factors and then adjust as needed. The goal is to prevent premature wear and downtime by maintaining lubrication at wear points without producing lubrication droplets on the bottom of the lube point.

Q: What types of new product developments in lubrication are addressing key customer issues?

A: Effective plant maintenance involves managing maintenance costs and working to eliminate downtime, and lubrication systems can play a key role by automatically lubricating wear points. Today's lubricator controllers allow users to create a lubrication program that matches the unique conditions within their facility, which can save labor and reduce lubricant consumption.

Another new product is conveyor monitoring systems. These systems are available in a variety of configurations, and Mighty Lube manufactures one that monitors chain link wear, lubrication cycles, drive amps, air take up pressures, and more. Because this information is available in real-time through a networked computer, authorized users can quickly identify potential maintenance issues before they become costly downtime. Mighty Lube and OPCO Lubrication Systems also manufacture monitoring systems to monitor chain link wear for a single line, and this can be a cost-effective option for plants with a small number of conveyors.

Q: What are some of the biggest mistakes relating to lubrication that you see industrial users make in regards to their conveyor systems?

A: One of the most common mistakes is over-lubrication. A properly lubricated chain will be wet on the inside and dry on the outside. Over-lubrication results in wasted lubricant as well as both safety and housekeeping issues. Also, conveyor lubricators can get damaged during plant operation, and customers following industry best practices have implemented a periodic maintenance program to inspect conveyor lubricators and the condition of conveyors. For instance, a broken trolley wheel could hit sensors or lubricant nozzles on a conveyor lubricator, and repairing this damage and readjusting the lubricator before premature conveyor wear and downtime occur is critical. To implement a periodic maintenance program, plants can utilize their own qualified staff or purchase a service contract from a company specializing in conveyor lubricators.

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Lubricant and grease selection also requires consideration. While these products are sometimes viewed incorrectly as commodities to be sourced based on cost, they must be properly matched to the lubricator and the conditions. Some lubricators are designed to operate with low viscosity lubricants, and others are designed to operate with a range of higher viscosity lubricants. Incorrect matching here will cause poor lubrication results and may damage the lubricator. After determining the correct viscosity, plants should source lubricants with characteristics matching their application. For example, using a general purpose grease to lubricate sealed trolley wheels that convey parts through an oven may cause the grease to run out of the trolley wheels or to bake into a hard carbon material. Grease with the correct temperature rating may cost more than a general purpose grease, but it will provide proper protection against wear.

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