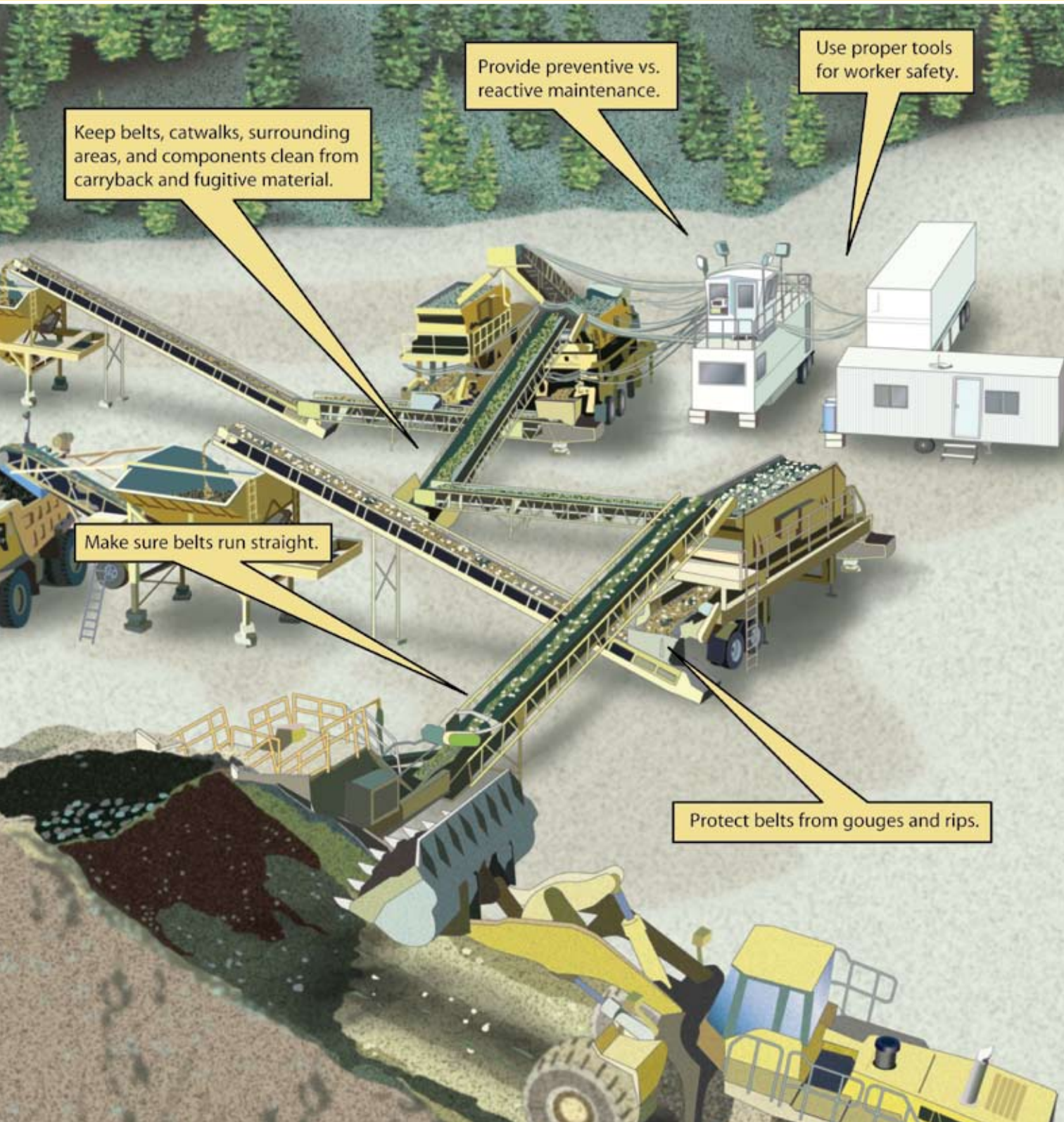


Optimize Materials Transportation for a Better Bottom Line



Keep belts, catwalks, surrounding areas, and components clean from carryback and fugitive material.

Provide preventive vs. reactive maintenance.

Use proper tools for worker safety.

Make sure belts run straight.

Protect belts from gouges and rips.

AGGREGATES MANAGER

Protect Your Belts

It's been said that conveyors are the arteries of any aggregate processing plant, carrying material from one process to the other, before finally taking it to the finished product stockpiles or loadout.

But in spite of their importance, many operations tend not to place a lot of importance on the proactive maintenance of their conveyor systems, especially in a down economy, says Chip Winiarski, market manager for Downer's Grove, Ill.-based Flexco.

"If you think about the capital requirement for a new piece of equipment, you tend to think of the big dollars going toward a new crusher or other large piece of equipment," Winiarski says. "But in reality, the most expensive purchase you can make over the course of a year is the conveyor belt. And producers need to emphasize both productivity and protection of the belt because, if you're not moving product, you're not making money."

Winiarski notes the biggest issue with equipment maintenance programs today is lack of manpower. "Plants have experienced numerous layoffs," he says. "And maintenance often takes a back seat to operational needs. But reactive maintenance — when there's a problem — costs more in downtime and lost revenue than a regular care program, even when there's a manpower challenge."

One answer to this challenge is to rely on a partnership with your equipment and conveyor components manufacturer and/or

distributor — most of whom have service staff that can handle scheduled equipment maintenance. "It's a model that has been followed for years in South Africa and Australia, where mining is a lifeblood industry, and it's becoming more popular in the United States," Winiarski says. "In the matter of conveyors, a distributor can regularly come and check to make sure that cleaners are tensioned correctly, and that blades are changed at the proper intervals, for example. It takes the pressure off the producer for making sure this happens."

That said, what should aggregate operations do to protect and enhance productivity of conveyor systems on a daily basis? First of all, according to Gary Myers, plant foreman for Grand Rapids Gravel based in Grand Rapids, Mich., prior to startup each day, operators should inspect the gearboxes, bearings, idlers, splices, and the primary and secondary cleaners — as well as the belts themselves — to ensure that all are clean, running well, and free from damage. Myers' operation also has underground conveyors, so having cameras in place can help with inspections, he adds.

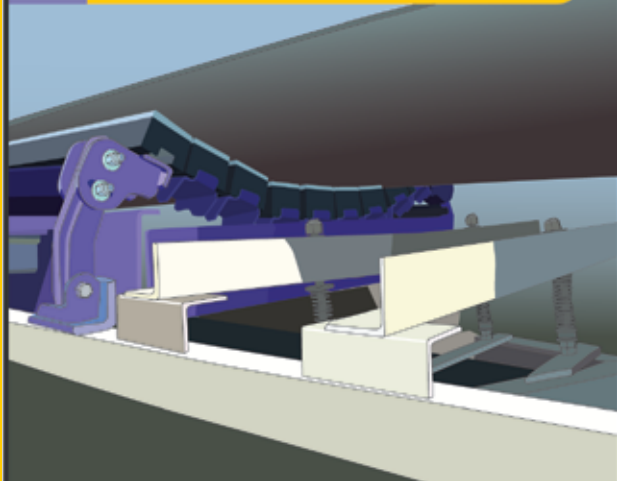
In addition to these tips, says Jim James, general manager for Sellersburg, Ind.-based Sellersburg Stone, producers need to make sure belts are tracking properly and that impact idlers and impact beds — which are wear parts — are adjusted and properly maintained. "The bars do wear, so you need to raise them or replace them to ensure they do their jobs protecting the belt," he says.

OPERATIONS

Optimize Materials

1

Protect belts at impact points



The impact zone — where material hits the conveyor belt — is the most damage-prone section of the conveyor belt. If the conveyor belt cannot absorb the energy of the dropping material, it will suffer from gouges and rips. Impact beds can help cushion the shock. In addition, producers should regularly inspect bars and beds at the impact point to ensure proper function.

4

Explore belt fastener options



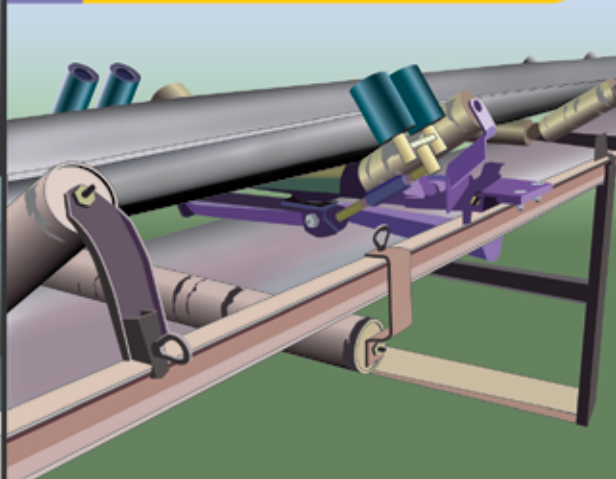
A correctly vulcanized splice is an excellent method for belt fastening, especially in conditions where the belt tension must be above 2,000 pounds per inch of belt width (PIW). The cost of a vulcanized splice, however, can be prohibitive. Mechanical fasteners are an economical alternative, costing up to 85 percent less in terms of manpower and downtime, with little or no loss of splice quality.

TIONS ILLUSTRATED

Transportation for a Better Bottom Line

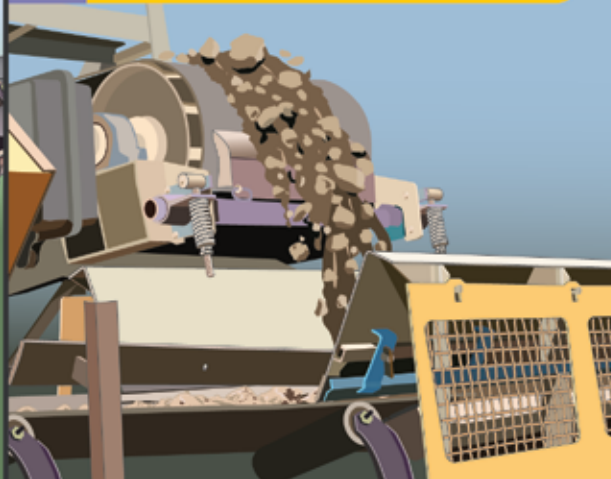
OUR EXPERTS

2 Keep your belts in line



A "mistracking" belt will wander from side to side, not only causing edge damage to the belt, but also reducing output and creating safety hazards. Combat this problem by adding belt positioners and/or trackers. Placed either on the top side or return side of the conveyor, a positioner will automatically reposition a belt that runs off course.

3 Clean belts for better production



Carryback and spillage can cost time and money; the need to shovel spilled material also creates a safety hazard for workers. Primary and secondary belt cleaners make sure the material lands in the proper place and that it doesn't accumulate on return idlers and rollers. Diagonal and v-shaped belt plows protect tail pulleys from lodged rocks, which can cause belts to rip.

5 Protect operation and workers



Aside from guarding, keeping belts properly maintained does the greatest amount of good in protecting employees and the bottom line in a conveyor system. Maintenance hazards increase when employees try to lift and pull belts with their legs, backs, and arms, or cut belts with an open blade. Belt lifters, belt clamps, and belt cutters reduce injuries on the job.

6 Prevent, rather than repair



Preventive maintenance is often the first casualty in a tough economic climate or if there are issues in the plant. Loss of a maintenance program can lead to lengthy downtime and lost income if a repair becomes necessary. Partner with conveyor and service experts through a manufacturer or distributor to ensure there is no interruption of preventive maintenance programs.



With 13 years of industry experience, Chip Winiarski, market manager for Flexco in Downer's Grove, Ill., holds a bachelor's degree from Oberlin College and a master's of business administration degree from The Max M. Fisher College of Business at The Ohio State University. Prior to joining Flexco, Winiarski was a manager of industrial process filtration and a food industry marketing manager.



Jim James, general manager for Sellersburg Stone in Sellersburg, Ind., has worked in the mining industry since he graduated from school. A third generation miner, he has been in the industry for more than 12 years. James has also worked for Gordon Stone in central Indiana and Spencer County Sand near Evansville, Ind. Initially driving a water truck, James has worked in maintenance, later holding the positions of quarry foreman and superintendent before he became general manager of Sellersburg Stone.

As a foreman for Grand Rapids Gravel, in charge of one of the company's two sand and gravel pits, Gary Myers has been in the aggregates industry for more than 40 years, starting as a general laborer when he returned from Vietnam. He worked as a union truck driver for 20 years and has since been in management for Grand Rapids Gravel for an additional 20 years.

OPERATIONS ILLUSTRATED

Voices of Experience

Chip Winiarski

There are a number of cost-effective products producers can use to help keep their conveyors running trouble-free, according to Flexco's market manager Chip Winiarski, who explains that the first step in conveyor maintenance should be proper protection of conveyor belts.

The "impact zone" is where the most belt damage typically occurs, Winiarski notes. This is the point where material drops onto the conveyor from varying heights. If the belt cannot properly absorb and dissipate the energy transfer from the falling material, it can suffer from gouges, cuts, and tears.

Depending on the size of the material dropping to the impact zone, producers can protect their belts by using impact idlers and impact beds, which will cushion the belt from the falling rock. "An impact bed costs a fraction of a new conveyor belt," Winiarski says.

Other products producers can use to protect their conveyor belts include belt plows and primary and secondary belt cleaners. Belt cleaners, which are typically positioned on and/or behind the head pulley, protect conveyor belts while ensuring minimal loss of material from material carryback. "Loss of material can cost an operation thousands of dollars per year," Winiarski says.

"You want as much material off the conveyor and downstream as possible." Belt plows help to keep the inside of the belt clean, as they protect the belt and tail pulley from lodged rocks, which can tear the belt.

A belt that tracks improperly will also create problems for producers because not only can material spill off of the belt, but it can also tear at the edges. "Positioners and trackers work consistently, reacting and adjusting a mistracked belt automatically, to make sure that it runs inline from the tail pulley to the head pulley," Winiarski says.

Jim James

What has changed the most in conveyor care over the years? Sellersburg Stone general manager Jimmy James believes it's a combination of better quality components and a greater willingness on the part of producers to invest in those components for longer life of the conveyor and better worker safety.

"In the past, when it came to conveyor belts, producers often would get the cheapest belts possible to operate with. The attitude was that the initial expense was huge, so it seemed to make sense to get a cheaper belt," he says. But James explains that this attitude has changed. "In reality, if you buy one good-quality \$10,000 belt, it's a capital expenditure, versus having to buy three \$3,000 belts over the year because they wear out — and they're not a capital expenditure. It doesn't make good business sense (to go with the latter)."

Idlers are another component that James feels have enjoyed great improvement over the years. "The old metal type of rollers would frequently wear out," he explains. "Now we use ceramic rollers, which are greaseable, and they last much longer. This is a great improvement because, not counting belts, I'd say 70 percent of conveyor maintenance expense comes from the idlers."

James says that he has seen more careful thought and efficient design reflected in new system designs. "where the plant might have used a 36-inch conveyor before, now we know a 24-inch conveyor can do the job, which helps to keep belt costs down."

Worker safety around conveyor systems has been addressed in recent years through better equipment, components, and tools. James says that newer conveyors are more user and maintenance friendly, with manufacturers putting better safety into design considerations.

Gary Myers

As plant foreman for Grand Rapids Gravel, Gary Myers says he has gained valuable experience in conveyor maintenance practices over the years.

Myers says, at one time, Grand Rapids Gravel did not employ the use of belt cleaners on its conveyors. "Cleanup was a big issue," he says, "because we work a lot with wet sand, and the carryback problem was huge, with sand sticking to the conveyor on the return side."

Additionally, some conveyors in Myers' operation transport material underground, where spillage and carryback cannot be cleaned on a regular basis. "So today, company-wide, we probably have 100 belt cleaners in use on our conveyor systems," he says. "By adding trackers to our underground conveyors, we are able to better control keeping the belts inline. These tools all help to take out man-hours — and also address safety when we don't have to handle cleanup and tracking manually. We also have more material in the finish pile, versus the junk pile, which helps the bottom line."

Myers says he is proud that Grand Rapids Gravel has grown and has been willing to adopt new technology to aid in equipment maintenance. "We have to be more efficient," he notes. "We have 1/2 mile of conveyors to maintain, and we don't have the manpower to handle tracking and cleanup with that many (feet of) conveyors. So we take advantage of technology to help us maintain our conveyor systems."

Pinning down general advice for conveyor maintenance is a difficult task, Myers says. "But in general if you keep up inspections, use good rubber and quality splices, make sure your impact points are protected, and keep your belts as clean as possible. Your conveyors should do their job without costing your operation in lost material and downtime."