

AGGREGATES MANAGER®

Your guide to profitable production

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A person wearing a blue cap, a red hoodie, and blue pants is seen from behind, standing in a doorway. They are looking out at a quarry or aggregate processing site with a conveyor belt and piles of material under a clear sky.

Three tips for attracting millennials to the industry

15 Avoid highwall hazards

24 Leverage technology for your scale

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Your Guide To Profitable Production

On Our Cover: How do you attract millennials to the aggregates industry? Ask Dave Turin.

Cover illustration by Sandy Turner



John Deere ups the ante with more horsepower in its new 850L dozer.

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Digital notifications show service providers what part of the scale has an error, allowing for quick repairs.

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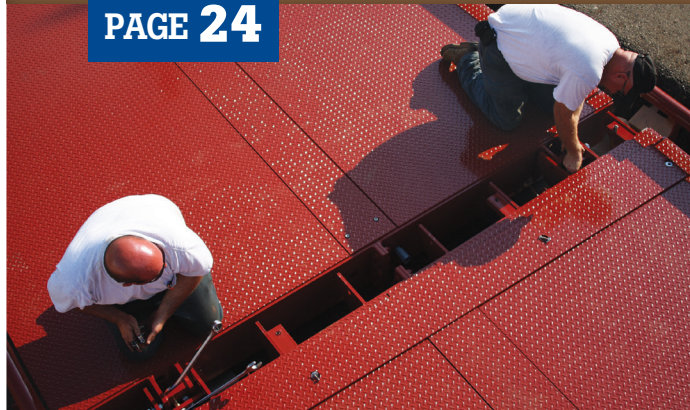


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Eliminate a Housekeeping Hazard

A well-designed transfer point contains material for cleaner, safer, and more productive conveying.

As tons of material per hour are quickly dropped with great force through receiving chutes onto a receiving conveyor, fugitive cargo often piles up around the frame and dust migrates throughout the area, collecting on idlers, pulleys, and floors and affecting air quality. Workers have to continuously clean up the material before

it encapsulates the belt, potentially exposing them to a hazardous work area around a moving conveyor, where even incidental contact can result in serious injury in a split second. Considering that most conveyor injuries occur through routine maintenance or clean up, controlling fugitive material is becoming one of the primary elements in a well-organized

effort to reduce hazards and prevent injuries.

"Conveyor operators need only take a broad look at the expense that fugitive material has on a system to realize the full cost that accompanies inefficient transfer point designs," says Jerad Heitzler, product specialist at Martin Engineering. "Problems such as improper



A well-designed transfer point controls the maximum load at the highest achievable volume.

belt support, badly sealed chutes, damaged idlers, and uneven cargo distribution can all result in spillage and belt mistracking. They also contribute to increased costs for lost material, premature equipment failure, maintenance and cleanup, as well as the potential for injury and compliance issues. These factors raise the cost of operation and reduce profit margins.”

In a properly-engineered transfer point, each component, from the chute design to the cradles and dust seals, is employed to maximize its specific function and contain dust and fines, while at the same time offering workers easy access for maintenance.

Transfer points

Containment is the key to avoiding spillage and dust, and there are a



Cleaning up spillage exposes workers to a potential hazard area from the moving conveyor.

number of components designed for this purpose. Although shaped transfer chutes and rock boxes direct the material flow to mitigate the concussion of material on the belt, most high-volume operations need one or more impact cradles to absorb the force of the cargo stream. Heavy-duty impact cradles can be equipped with rubber or urethane impact bars with a top layer of slick UHMW plastic to minimize belt friction. Able to withstand impact forces as high as 17,000 lbf and drop heights of up to 50 feet, support beams in the center of the cradle are set slightly below the receiving belt’s line of travel. In this way, the belt avoids sustained friction when running empty and yet can absorb hard impacts during loading, while still retaining a tight belt seal.

Within the settling zone — located after the impact cradle in the conveyor chute box — slider cradles can then create a troughed belt to center the cargo and reduce disruption quickly, aiding in dust settlement. Slider cradles, located down the length of the skirted area, have several functions. One is to create a trough angle that adequately centers the load. The trough angle also plays an

important part in retaining a tight seal between the belt and the skirt. Lastly, using track mount idlers in between each cradle, a smooth belt path is created through the settling area, one that can be easily maintained. A smooth belt path should have no gaps, minimizing disruption and promoting containment, allowing dust and fines to settle into the material stream prior to leaving the containment area.

Airflow

With a constant stream of material crashing on the impact point of the receiving belt, the transfer point can be extremely turbulent, and this turbulence must be contained. By slowing the airflow in the skirted area, suspended dust is allowed to settle onto the cargo path. To contain the mixture of air and disrupted material, a stable, correctly-supported belt is needed for the sealing components to function properly. Without a stable beltline, the belt will sag between idlers, and sealing components will not prevent air and fine material from escaping out of the resulting gaps, causing spillage and dust emissions.



An effective transfer point requires the belt's line of travel to be stabilized and supported.

Chute sealing

By closing gaps and keeping a tight seal on the belt, apron seals can also be attached to the chute walls to prevent

fugitive dust and fines from escaping. "A crucial requirement in any transfer point designed for reduced spillage and high efficiency is an effective skirting and

wear liner sealing system at the edge of the belt," Heitzler explains. "Modern designs feature external skirting, which establish the tight belt seal needed to eliminate fugitive dust and fines."

The external design requires minimal tools and no confined space entry to inspect, adjust, or replace wear liners or skirts, and, in most cases, can be performed by a single worker. The low profile of the skirting assembly needs only a few inches of clearance, allowing installation and maintenance in space-restricted areas. The design of these components drastically reduces scheduled downtime and the potential workplace hazards associated with replacement and adjustment.

Dust filtration

In operations with limited space for a settling zone or especially dusty materials, dust bags and curtains may be essential components. Providing passive relief via positive air pressure created at belt

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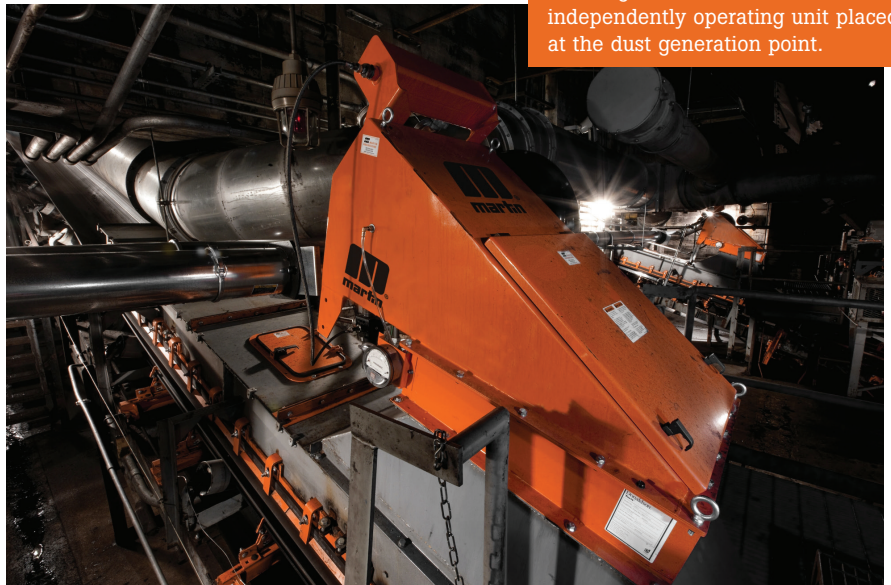
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Randall Reilly

conveyor loading zones, dust bags prevent the escape of airborne particulates by venting the air and collecting dust at the same time. Installed at the exit of the loading zone and mounted in the skirtboard cover, dust curtains can help create a plenum for dust suppression and dust collection. For additional dust control, an integrated air cleaner system can be installed at the point of emission, containing a suction blower, filtering elements, and a filter cleaning system.

Conclusion

Managers concerned with the overall safety and cost of operation need to review potential hazards, the impact of rising labor costs for cleanup and maintenance, combined with the expense of potential fines or forced downtime, to determine specifically how they can affect the bottom line. Using the technologies described here, even poorly-performing conveyors often don't need to be replaced or rebuilt, but merely modified



An integrated air cleaner is a small, independently operating unit placed at the dust generation point.

and reconfigured by knowledgeable and experienced technicians installing modern equipment.

"These improvements will help operations improve efficiency, reduce risk

and contribute to regulatory compliance," Heitzler adds. **AM**

Article courtesy of Martin Engineering.



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