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Coal Handling Equipment

Mine Power Systems

Improvements for Coal Handling Systems

Operations rely on conveyors to clear coal from the face and transport it long distances. Availability with these systems is key. When the mainline conveyor is down, the mine is down. Therefore, preventive maintenance for conveyor systems is vital and recently several manufactures announced improvements to the systems they provide.

As an example, Martin Engineering said it has reimagined the bulk handling transfer chute to reduce downtime for installation and offer more options for future modifications. The Martin Transfer Point Kit includes modular horizontal loading zone, settling zone, and stilling zone configurations, providing easier installation and a wider variety of chute options while facilitating future upgrades. The kit simplifies the installation process, reducing the amount of labor required for assembly and allowing the system to be pre-built prior to installation for reduced system downtime. The result is faster installation with less labor and shorter shutdowns, increasing the return on investment (ROI).

“This is a rugged one-kit solution designed to fit most standard conveyors and belt widths, regardless of what material is being transferred,” said Dave Mueller, conveyor products manager at Martin Engineering. “Our Center for Innovation (CFI) is constantly looking for ways to engineer equipment with safety and our customer’s bottom line in mind. That’s why the kit doesn’t just streamline labor, time and production, but it’s also a logistical solution by shipping it in one crate.”

The Transfer Point Kit is a heavy-duty horizontal enclosure for the loading zone. Each kit is either ordered as a loading zone, settling zone, or stilling zone. The width and length of the kit are determined by the receiving belt’s width and speed and the dust characteristics of the material being transferred. Dustier applications may require a longer settling zone.

This innovation solves three common problems. The first is that transfer



Martin Engineering's modular transfer kit installs easily and facilitates future upgrades.

chutes are normally shipped in different packages that sometimes don’t arrive at the same time. Upon delivery, inventory is stored until scheduled downtime, increasing the chance of loss or misplacement. Another problem is, for most new transfer chutes on the market, some components can be prepared and assembled beforehand, but generally, new chutes need to be completely fabricated during downtime. The inability to build the structure before a shutdown increases the project budget and contributes to lost production time. The third problem is, after construction, horizontal transfer point chutes are commonly a single system that requires significant engineering and construction to be modified. Changes to existing transfer points can be challenging, but to accommodate new belt support equipment or adapt to increases in production, the chute is often raised or lengthened.

To address these problems, the chute sections are delivered in a single crate with every component for assembly included, can be assembled prior to the

shutdown and installation, saving time and money, and they are fully modular, making future changes easy without expensive construction projects.

The transfer point system accommodates belt widths of 18-72 in. (450-1,800 mm) and an internal chute width of 9-59 in. (228-1,498 mm). Each modular section is either 4 feet (1.21 meters) or 6 ft. (1.82 m) long and constructed of mild steel, 304 stainless steel or 316 stainless steel, with a thickness of 0.25 in. (6.35 mm), 0.5 in. (12.7 mm), or 0.75 (19.05 mm) to accommodate a wide variety of materials and conditions.

The taller loading zone controls air turbulence and connects to both the drop chute and settling zone. When cargo hits a belt with great velocity, fines and lumps splash up the sides of the belt. Without a properly sealed enclosure, the material will spill underneath the conveyor, creating a hazard, restricting access and fouling other components. The settling zone follows the loading zone and helps mitigate dust emissions. Dust is collected, mechanically filtered or settled back into the cargo stream prior to

leaving the stilling zone and continuing as a conventional open air conveyor.

Listed under a single part number, the kit includes a chutewall weldment, wearliner assembly, wearliner plate, outer chute supports, top cover, tail panel/clamp/rubber sheet, installation hardware and an owner's manual. The skirt seal is sold separately, since it is a single piece that runs the entire length of the chute and skirting is the most frequently replaced wear part in most transfer points.

The kit installation is covered under Martin's Absolutely No Excuses Guarantee as long as a Martin Engineering technician is involved in the installation process. Although assembly instructions are clear and easy to follow, another benefit of involving a factory-trained Martin expert is that customers who have ordered the kit have experienced a significant reduction in assembly and installation time. Moreover, once the system is started up and tested, there is a knowledgeable person

on-hand to offer advice on adjustments to ensure optimum performance.

"After installation, Martin Territory Managers or partner distributors are available to offer support," Mueller added. "The feedback for the kit has been excellent. Customers get the heavy-duty Martin quality they've come to expect in a more convenient, efficient and sustainable package."

Wear Liners Protect Chutes

In related news, Martin also has the Manufactured Canoe Liner, which is made from durable urethane molded around a rugged steel plate to absorb impact and abrasion from the punishing bulk handling environment. With the protective plate integrated directly into the urethane liner, the design delivers superior shielding of the skirt sealing system and chute wall from heavy, fast-moving cargo. The result is extended equipment life, longer periods of dust and spillage control, improved safety and less maintenance, reducing the overall cost of operation.

"This is a shift in the engineering and role of wear liners," Mueller said. "Like most conveyor components, the design has evolved into a component that is more effective, safer to maintain and more reliable."

Previously, most wear liners were sheets of steel welded onto the internal chute wall of the conveyor loading zone. These protected the wall from the punishing effects of splashing, shifting and abrasive material. But since they are wear parts, periodic replacement of these early designs involved enclosed

chute entry and hot work using torches, which required certification and supervision, while running the risk of igniting explosive dust. The steel plates generally did not effectively protect the rubber skirt seal, leading to more frequent skirt replacements. Moreover, the wear liner's position often left a gap between the liner and the skirting, which captured small lumps of material that could damage the belt. These design issues resulted in excessive downtime, premature equipment replacement and extra labor to monitor and maintain.

The Canoe Liner is an engineered urethane strip molded directly around a protective steel plate. The unique approach avoids the bonding issues common to previous designs, preventing urethane separation from the plate that could damage the belt and enclosure.

Each section has a series of 2-in. (51 mm) long bracket holes for vertical adjustment. The bottom "belt side" of the liner is cut to an optional 20°, 35°, or 45° angles to maximize belt sealing and protect the softer material of the skirt seal from premature wear. Depending on the weight and abrasiveness of the conveyed material, customers can choose a urethane thickness of 1.3 in. to 2 in. (33 mm to 51 mm).

Delivered in storable cartridges 48 in. (1,219 mm) in length, the units can be cut on site to match the needs of the chute. The cartridges can also be installed vertically on top of one another to accommodate taller chute walls or raised enclosures. Like the lower sections, the upper units can be adjusted as well.

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