COMPLETE CONVEYOR SOLUTIONS

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ASGCO, USA, explore ways in which cement plants can increase production without increasing maintenance or costs.

Containing in the load zone
As cement processing facilities worldwide push forward to increase production, one of the fundamental problems arising is the containment of dust and fugitive materials. Increased material flow naturally produces more dust and fugitive material, and usually requires increased maintenance due to debris escaping from the conveyor belt at a higher rate. Cement dust quickly accumulates creating not only a dangerous environment, but leading to costly repairs, downtime, injuries and significant fines.

Containing dust effectively starts at the load zone. Effective sealing limits its ability to escape, meaning airborne particulate
design of the Pro-Zone also allows for rapid change outs of the wear items. All wear components can be replaced in minutes without complicated procedures or expensive tools, allowing operations to be restored quickly. One particular cement processing facility receives barges several times a month and, depending on demand, even more. The raw material travels atop the silos. This material has finer properties that were escaping and filling the structure surrounding the conveyor. This thick dust and debris would settle throughout the room, sometimes upwards of several feet. The floor would be lined with this expensive material that, once exposed, has become useless in the cement process. Additional cost rendered would be time and effort for the removal of the material and any disposal fees.

ASGCO, working closely with our factory trained Servicing Distributor, supplied the Pro-Zone self-contained system, designed to fit the parameters of this particular conveyor. Belt speed, bulk density, material characteristics and air flow, among many other factors, were taken into consideration. CEMA design standards were observed – including 20° transition idlers before and 35° troughing idlers after the Pro-Zone. The ASGCO Pro-Zone created a sealed belt support system, with quick access, in order to monitor and service with easy adjustments. The Pro-Zone was designed around the existing chute and dust collection system. The placement of custom designed new baffles and expansion pieces tied the new load zone succinctly together.

After installation of the Pro-Zone, the powdered material no longer plumes into the room and improved efficiency has lifted the morale of the maintenance staff. The team used to kick up this material and breathe sooty air just for basic maintenance. Cement dust on the floors can be a potential safety hazard for slips, trips and falls, especially when wet. The cost of removing the wasted product has been virtually eliminated by the cement facility. The ASGCO Pro-Zone removed a costly obstacle in the company’s procedures and allowed for increased production, less housekeeping, lower maintenance costs and a safer working environment.

**Dust containment**

Once dust has been controlled at the load zone, the goal shifts to eliminating dust along the belt. Current guidelines for PEL (Personal Exposure Limit) and dust control are critical to any operation that is handling materials that can create airborne particulate during processing. For example, the conveyor galleries at one particular plant had an unhealthy volume of dust suspended in the air, making it difficult to see from one end of the gallery.
Tru-Trainer tracking idler in action.

to the other. Operators had to wear dust masks and respirators at all times. This is a condition commonly seen in clinker conveyor galleries.

The dust control team from the plant worked with ASGCO to help with the installation and operating procedures of the ASGCO Wash Box™, to help reduce the dust and carry-back. This is an effective technology in dusty applications where respirable dust is an issue. This becomes especially important as the industry faces new regulatory guidelines for silica dust exposure with lower PEL limits. The Wash Box is a self-contained belt cleaning system that uses a combination of water sprays, tungsten carbide belt cleaners and rubber/urethane squeegee’s to effectively scrub and rinse the belt as it passes through. The cleaning system was implemented and refined with a programmed water source to turn on upon startup of the conveyor and shut down five minutes after the conveyor belt shuts off. This greatly minimised the amount of resources needed to keep the belt clean and remove dangerous dust buildup before it escaped into the surrounding environment.

Air quality tests being performed have proven that the airborne dust levels in this area of the plant showed a reduction of 60%. Operators that were originally skeptical about the effectiveness of the ASGCO Wash Box now insist that it runs every day. Dust levels without the Wash Box averaged 6 mg/m³ and dust levels with the Wash Box average less than 2 mg/m³.

Training to win
An essential requirement of all Load Zones is that the belt tracks properly in the area where material is being discharged onto the belt. A belt that is not centered in the Load Zone is sure to increase risks of dust and spillage. Belt tracking to avoid misalignment is an essential element in the goals of increasing production, reducing maintenance and downtime, and to ensure proper sealing. It has also been determined that belt misalignment can contribute as much as 14% to conveyor energy consumption in severe cases. A belt that self-centres and requires no edge contact with guide rollers will perform at a much higher level, with no belt edge damage, lower energy consumption, and more even tension distribution throughout the belt carcass. This allows cement processing plants to operate at high capacity for extended periods, yielding higher output and lower total cost of ownership when considering that the conveyor belt replacement cost is 35 – 50% of the total cost of all components on a belt conveyor. Selecting the best available technology for conveyor belt tracking can be a very important decision when considering total cost of ownership. One of the problems with conventional training idlers is that they are not effective at handling the variable loads and demands asserted on them with inconsistent load weights, volumes and materials.

In many cases, the side-guided rollers and exposed centre pivot will seize, which can create severe belt edge damage. The training idler is often tied off in one direction, restricting actuation when needed. Lastly, conventional tracking idlers will not work on reversing conveyor systems. On one particular reversing conveyor system, the customer had a conveyor belt misalignment switch triggering an alarm nearly every day, leading to costly shut downs and investigations.

ASGCO’s field engineers conducted a complete survey of the conveying systems and the biggest problems were identified. It was recommended to the customer that they install ASGCO’s Tru-Trainer® Dual Urethane conveyor belt tracking idlers approximately 20 ft. – 30 ft. (7 m – 10 m) prior to any conveyor pulley. After the installation of the Tru-Trainers the customer has not had a single belt mis-alignment alarm triggered on any conveyor that has a Tru-Trainer installed, including the reversing conveyors.

Conclusion
Every cement processing system has challenging conditions – whether large or small, constant or intermittent, open or obscure. No matter how basic the assignment, the design team will always identify ways to increase production and to reduce operating costs, proving to be one of the wisest investments an operator can make.

Installing ASGCO’s Pro-Zone, Tru-Trainer and Wash Box are just a few ways responsible bulk handling operators could maximise their operations.