



Case Study

Reduce Conveyor Servicing Costs: Mexican Cement Manufacturer Addresses Conveyor Carryback

Edited by on 5. Sep. 2019

[Published in bulk solids handling, Vol. 36 \(2016\) No. 1](#)

Spillage from a belt conveyor isn't just a dirty mess, it's also a source of safety and cost problems. Following find a solution delivered to Mexican cement manufacturer.

(From the archive of "[bulk solids handling](#)", article published in Vol. 36 (2016) No. 1 , ©2016 bulk-online.com)



Fugitive material caused equipment failures and maintenance costs estimated at USD 67 000 per month.
(Pictures: © Martin Engineering)

One of the world leaders in conveyor bulk handling solutions helped a cement manufacturer resolve fugitive material buildup problems caused by a variety of alternative fuel resources (AFRs). The second largest cement producer in the country, Holcim Mexico increased the use of solid and liquid AFRs at one of its

facilities, but the change resulted in spillage and carryback that caused equipment failures, cleanup and maintenance costs estimated at USD 67 000 per month. The solution from Martin Engineering Mexico has significantly reduced the amount of spillage, increased workplace safety and lowered the cost of operation. Located in southeastern Mexico, the Planta Macuspana facility produces 1 million metric tons (1.1 million tons) of cement annually. Out of Holcim's total annual output of 12.6 million metric tons (13,89 million tons) from seven operating plants, nearly 14 percent of the total thermal energy demand was fulfilled by the use of AFRs in 2013. Using 1990 as a benchmark, the corporation's entire Mexican cement production has more than doubled, with an increased annual energy consumption of only 45 percent, reducing CO2 emissions per ton of cement by 25 percent. However, maintenance costs threatened to offset the economic benefits of the program.

Several Types of Carryback

Delivered in both solid and liquid forms on seven 40-inch-wide (102 cm) conveyor systems, 1.5 metric tons (1.65 tons) of solid waste and 21 metric tons (23 tons) of sludge are carried to the calcinator per hour. Solid waste products including paper, wood, plastics and shredded tires are run through a crusher and measured for caloric content (the amount of energy contained within a substance). Consisting of petroleum slurry and contaminated water, the liquid waste is mixed with sawdust and dried before also being measured for caloric content. After processing, the mix is loaded into a feed hopper, passes over a belt scale and before being distributed by a mechanical feed valve onto the conveyors. Prior to implementing the Martin Engineering components, the Macuspana facility utilized a mix of belt cleaners without tensioners and cleaning systems fabricated in-house, with ineffective results. Spilling approximately 6 tons (5.4 metric tons) of solid and liquid material per month, the process had to be monitored by a full-time employee who reported daily on spillage volume and potential hazards. Twice per month a four-person crew required a full shift of downtime to clean up piles of material and sludge from around the conveyor frame.

Versatile Solutions



Performance duty belt cleaners were installed at each of the seven conveyor discharge points.

Following a thorough assessment of the situation, the Martin Engineering Mexico team determined that a QC1 Cleaner PD (Performance Duty) should be installed at each of the seven conveyor discharge points. Integrated onto the existing mainframes, the units comprise of a single urethane blade connected to a steel mandrel, which is turned by a heavy-duty spring tensioner, retaining a tight seal

on the belt. The blade design utilizes patented Constant Angle Radial Pressure (CARP) technology to maintain an efficient cleaning angle throughout its service life, without damage to the belt or splice. For applications involving belt speeds of up to 900 fpm (4.6 m/sec) and service temperatures of -40° to 160°F (-40° to 70°C), operators can choose between five different blade types to address the characteristics of specific kinds of cargo for each conveyor. Available in lengths of 18 to 96 inches (457 to 2438 mm), blades can also be ordered in 10-foot (3.05 meter) slugs, allowing operators to cut to length for increased versatility.



The single urethane blade is mounted on a steel mandrel and tensioned with a heavy-duty spring.

The unit features a no-tool replacement process that can be performed safely by a single worker who simply pulls the locking pin, unclamps the bracket and slides the blade out of the mainframe. The new blade is slipped on and clamped into position, significantly reducing maintenance and replacement time. The immediate results with the newly installed equipment were really satisfying. The performance of the system was evaluated over a 28-day period, measuring the buildup of carryback as compared to the month prior to installation. Operators reported approximately 90% less fugitive material over the entire evaluation period, resulting in a drastic reduction in downtime and labor needed for cleanup. Plant managers predict that the upgraded belt cleaning system will extend the life of idlers and other conveyor components, minimizing unscheduled outages due to equipment failures. Moreover, operators confirmed that worker morale was greatly improved due to the easier cleanup and better working conditions.

About the Author

Rick Felde Technical Writer for Martin Engineering, USA