

Good Vibrations: Dealing With Dust at Lime Plant

Company finds an innovative way to use a maintenance-free vibrating tube feeder to reduce not only dust but also waste. Here's the story of how they did it...

'The carryback, which was discarded as unusable, amounted to about five tons per week.' By Kim Robert Jaynes and Richard C. Wahl

Lime and limestone products are among the oldest materials used for a wide variety of applications. These products serve as essential building blocks in virtually every industrial process. For Graymont, the third largest producer of lime in North America, this diversity means a customer base that crosses into such varied industries as environmental remediation, chemical and waste treatment, pulp and paper, mining, power generation, agriculture, steel and construction materials. The company, which has facilities across the U.S. and Canada, makes a conscious effort to protect the health and safety of its employees, visitors and neighbors in surrounding communities. In all aspects of its operations, it strives not only to reduce waste but also to identify and prevent hazards. Such was the case at the company's Cricket Mountain plant in Utah, where a problem was identified that involved a belt conveyor and dust.

The plant's location and the nature of some of its product produce conditions where controlling dust is critical. The company was using a belt conveyor to transport 1/8-inch-sized quick lime from two screens to an elevator, which then lifted the quick lime to a product storage silo. It was taking at least four man-hours each week to sweep and shovel the "carryback" from the conveyor. The carryback, which was discarded as unusable, amounted to about five tons per week. The dust problem also affected production because dust built up in the conveyor's webbing and moving parts, contributing to checking and wearing of the belt. The company tried using belt scrapers, but they didn't hold up under the plant's adverse conditions. An air knife was also tried, but it proved to be ineffective and required expensive plant compressed air. Finally, a vibrating tube feeder was thought of as a solution. A vibrating tube feeder from Vibra Screw Inc., which manufactures equipment to store, discharge, meter, convey, size and blend solid materials, was already in operation at the plant for a similar application. It had been installed six years earlier and had been so effective that it had been basically forgotten. It literally ran day in and day out with so few problems that it was taken for granted. Graymont asked Vibra Screw to spec and quote a new vibrating tube feeder system to replace the belt conveyor. It was soon installed and eliminated the dust problem. It also reduced the carryback and the need for maintenance. The unit

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consists of a sealed tube mounted with two rotary vibrators and supported on special elastomer isolators. There are no internal moving parts, and the unit is totally sealed. In operation, applied vibration moves material along the tube surface from inlet to outlet. Inlet and outlet seals provide a dust-free interface with the rest of the production process. The tube feeder provides material conveying without the carryback and the need for the frequent belt replacement associated with belt-type conveyors. Because the tube feeder is totally enclosed, it reduces the overall need for dust collection and control. These advantages allow the plant to keep nearly five tons of lime per week in the product stream as salable material while freeing up man-hours that could be used to enhance production rather than performing maintenance and housekeeping.

Kim Robert Jaynes is plant engineer at Graymont Western U.S. Inc., Cricket Mountain facility. He has a bachelor's degree in mechanical engineering and a master's degree in biological and agricultural engineering. Prior to joining Graymont, he served as site managing engineer for pollution control and ventilation and as project and maintenance engineer for Serbaco Inc. and as assistant factory engineer for Premier Pacific Seafood Inc. Richard C. Wahl is vice president at Vibra Screw Inc., 755 Union Blvd., Totowa, NJ 07512. The company's product range includes bulk bag unloaders and fillers, volumetric feeders, bin activators, vibrating feeders/conveyors, loss-in-weight feeders, storage pile activators, live bottom bins, live bins, continuous blenders, screeners, controls and turnkey systems. Questions about this article can be directed to Wahl at 973-256-7401. More information is available at www.vibrascrew.com.

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