Conveyor Improves Winery Filtration System

Beringer Wine Estates, St. Helena, Calif., improved the effectiveness of its winery waste filtration system by replacing a manual diatomaceous earth (DE) unloading and loading setup with an automated bulk bag unloader and flexible screw conveyor from Flexicon Corp., Phillipsburg, N.J.

Flexicon tested samples of DE on its flexible screw conveyors, then recommended and designed Beringer's current conveyor, hopper and bulk bag unloader. The new enclosed unloading and conveying method paid for itself in less than three years thanks to increased dispensing accuracy and the ability to purchase bulk DE.

Previously, workers manually opened and dumped palletized 50-pound sacks of DE from a work platform into two slurry tanks, which fed a filter separating solids from liquids. The automated unloading and conveying system eliminated such manual effort at a time when the company was anticipating a significant increase in winery production.

The automated bulk bag unloader lifts 1000-pound bulk bags of DE via an electric hoist and trolley atop a 16-foot-high cantilevered I-beam frame. Aided by flow promotion devices, the unloader fully discharges bags into the 30-inch hopper below. A flexible conveyor set at a 45° angle moves the DE from the hopper to two 12-foot-high, 1500-gallon slurry tanks of winery waste.

Filtration efficiency was optimized by the bulk bag unloader's loss-in-weight control, which precisely meters DE into the two 1500-gallon slurry tanks. The bulk bag unloader is mounted on load cells, which transmit loss-of-weight information to a controller. As the flexible conveyor feeds the slurry tank, the controller, upon reaching the set weight, slows the speed to a dribble before stopping the conveyor, thereby delivering the targeted dose.

"Dispensing accuracy gives us more filtration runs per amount of DE consumed," says John Pepe, director of cellar operations for Beringer. "Otherwise, adding too little DE would cause the effluent to plug the filters following the slurry tanks. Too much DE would clog the filters with DE. Both situations would prompt more filtration runs than needed."

The system’s flexible screw conveyor moves DE through a 4.5-inch diameter polyethylene outer tube enclosing a rugged, flexible stainless steel screw, driven by a small, three-horsepower electric motor. Only the inner screw contacts the material. As the flexible screw rotates in the tube, it self-centers to provide clearance between the screw and tube wall. Its simple design has no filters, external compressors, blowers or separators. PE

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