

Air Chamber Eliminates Water Distribution System Main Breaks

Burr Ridge, Ill., has celebrated its fifth year of nearly eliminating main breaks in its water distribution system thanks to an innovative concept developed by a water superintendent who studied the problem for more than 20 years.

The Heil[®]O, patented by Burr Ridge Public Works Superintendent Howard Heil, is an air chamber that serves as a shock absorber within the water system. In 1995, Burr Ridge was one of the first municipalities to install a shock absorbing device in its water system. Since then, the Chicago suburb has seen a dramatic improvement from its dubious record of three main breaks in one day.

"Burr Ridge has nearly 70 miles of water mains; some are 30-year-old cast iron," Heil said. "Today those mains are enduring line pressure up to 100 psi. I'm convinced that without the use of surge suppressors, we would have had to replace those cast iron mains." Heil estimated the main replacement cost would have run well over \$1 million.

Burr Ridge is not the only water system enjoying the benefit of Heil's invention. Maine Township, Hodgkins, La Grange Highlands, Norridge, Richton Park, North Aurora, DuPage County and Beecher also have installed Heil[®]O devices into their water systems.

Corrosion can occur so severely that nothing will prevent the need for replacement. However, by relieving the pressure of the water flow, the Heil[®]O can help a system troubled by corrosion or other conditions sustain itself indefinitely.

After years of observing both household plumbing systems and larger water distribution systems, Heil came to the conclusion that main breaks could be alleviated with surge suppressors. "When you ask people in the utility field what causes a main break, they'll say cold temperatures or freezing and thawing of ground," Heil said. "But those are just conditions. The real cause is . . . water hammer."

Heil defines water hammer as a shock wave that happens in a water distribution system

when hydrants, valves or pumps are activated and deactivated quickly. As the kinetic energy of moving water travels at the speed of sound, it seeks a release.

"Unfortunately, our intricate and uneven network of pipes with Ts, 90° angles and loops, presents obstacles for this fast-moving surge that is searching for release," Heil said. "It can find it in an elevated tank, but if the surge doesn't get to the tank quickly enough or if the water tank is frozen, something has to give. Often, it's your pipe or fitting or some other place where your system is weak."

By studying how the plumbing industry avoids the problem of water hammer, Heil concluded the same could be done for larger water distribution systems. He acquired a patent for the concept, and now the Heil[®]O is being manufactured by Cascade Waterworks Manufacturing.

For more information on this subject, circle 857 on the reader service card.

Bulk Bag Unloader, Flexible Conveyor Improve Filtration Effectiveness at Winery

Beringer Wine Estates, St. Helena, Calif., improved filtration effectiveness in its diatomaceous earth (DE) unloading and winery waste filtration area by an automated bulk bag unloader and flexible screw conveyor. The winery replaced a manual DE unloading setup with this automated, enclosed unloading and conveying method from Flexicon Corporation.

The automated bulk bag unloader lifts 1,000-lb. bulk bags of DE by an electric hoist and trolley at the top of its 16-foot-high cantilevered I-beam frame. Aided by flow promotion devices, the unloader fully discharges bulk bags into the 30" hopper below. From the hopper, a flexible conveyor, at a 45° angle, moves the DE to two 12-foot-high, 1,500-gallon slurry tanks of winery waste.

Optimal Filtration

Filtration efficiency was optimized by the bulk bag unloader's loss-in-weight control that precisely meters diatomaceous earth into the two 1,500-gallon slurry tanks. The bulk bag unloader is mounted on load cells that transmit loss-of-

weight information to a controller. As the flexible conveyor feeds the slurry tank, the controller, on reaching the set weight, slows the speed to a dribble before stopping the conveyor, delivering the target dose.

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

Beringer Wine Estates recouped its investment for the automated system in less than three years out of savings from the dispensing accuracy and buying DE in bulk bags rather than 50-lb. hand sacks that workers previously had to manually open and dump.

Modified System

In installing the bulk bag unloader, Flexicon modified an existing bulk bag frame from an earlier



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attempt by Beringer at automated bulk bag unloading. The former system metered the diatomaceous earth to a horizontal screw auger. The unloader was controlled based on timing rather than weight.

Flexicon added an agitator to the new system to eliminate bridging and caking of DE in the hopper and changed the conveyor screw to its Bevcon design to exert less compression on the material.

The system has since run with no problems.

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