

MATERIAL ACTIVATION SYSTEMS KEEP PET FOOD INGREDIENTS FLOWING

For pet food manufacturers, avoiding cross-contamination is central to their production process. Bulk material flow problems such as ratholing, bridging and other material blockages decrease flow through a process system which can contribute to possible cross-contamination. Additionally, these problems quickly become expensive. Decreased output from vessels, increased downtime for vessel clean-outs, and increased processing time raise the bottom line. Several material flow activation equipment options are available yet many companies resort to hammering containers to stimulate stuck material because the activation system they chose is not effective for their specific application. Hammering causes damage and wear to the vessel, and may also lead to operator safety issues such as shoulder and back problems from continual swinging of the heavy hammers. Elmira Pet Products, the largest Canadian private-label dry pet food manufacturer, produces wellknown brands for mass merchandise, grocery and the pet specialty channels, as well as unique diets for distribution to niche markets. In 2018, they researched a new material activation system to replace an ineffective system. Their research led them to the AirSweep Material Activation System.

THE PROBLEM

BRIDGING AND BLOCKAGES IN DRY MIX BINS

In 2014, Elmira Pet Products added two dry mix staging bins to existing bins. The two new bins immediately had issues with product flow due to bridging in the bottom of the bins, particularly above the slide gate. The feed blend consisted of meat and vegetable meal, ground grains and



Strategically-positioned VA-12 units on dry-mix bin

minerals, with a moisture content of approximately 7%. Vibrators and pneumatic hammers were employed to activate the material flow and eliminate the bridging. Neither solution was effective. Operators resorted to hammering the bins with sledgehammers to dislodge the material. Consequently, downtime increased, bins were being damaged from the hammering, and operators had to climb two stories of stairs and ladders to get the product moving again creating a safety risk.

In 2018, Riley Dahmer, Processing Engineering Specialist for Elmira Pet, contacted Control Concepts, Inc. to inquire about the [AirSweep®](#) system to replace the vibrators and pneumatic hammers. Designed to break friction to lift and sweep stalled material back into the flow stream, the AirSweep system delivers powerful bursts of compressed air or inert gas in a 360° radius, immediately resealing to prevent material feedback. Each AirSweep nozzle can activate up to 8 feet (2.4 m) of material without causing wear or damage to vessel walls.

Based on drawings provided by Dahmer, Eric Esselstyn, sales manager at Control Concepts, designed AirSweep placement drawings for each bin paying particular attention to the area above the discharge flange. The recommended system consisted of three carbon steel 1-1/2" [VA-12 AirSweeps](#) per dry-mix bin, strategically placed to stimulate flow in areas that were backed up with material. A programmable sequence controller triggered 0.25 second air pulses every 20 seconds to activate the material for a first-in, first out controlled flow. Four months after installation, some hangups were noticed in the bins. The AirSweep air pulse parameters are being tweaked to resolve these issues. "We are waiting for more feedback, but the situation is still much better than it was last year. We are in the process of converting our other dry mix bins to AirSweeps as well," stated Dahmer.

Elmira Pet Products purchased additional VA-12 units for another bank of bins that hold mix for extruders. Due to the slope of the bins, the material bridging was setting off nuisance alarms triggered by low level sensors 10" (25.4 cm) above discharge flange. AirSweep units will be placed above the blockage area, as well as higher on the sloped vessel wall to ensure materials continue to flow successfully out of the bins.



Strategically-positioned VA-12 units on dry-mix bin

THE SOLUTION

PREVENTING CROSS-CONTAMINATION

After an assessment of their systems revealed kibble fines were being left behind in a sloped transition approximately 4 inches above an airlock, Elmira Pet Products again chose to install an AirSweep system. "As a manufacturer of dry pet food, eliminating kibble cross-contamination is one of our top priorities" expressed Dahmer. A 3/4" VA-06 304 stainless steel AirSweep unit with 180° mounting coupling was installed in each vessel to dislodge the kibble fines out of a transition section of the bin between a slide gate and vane feeder during their cleanout cycles. With kibble fines still hanging in corners, Esselstyn worked with Dahmer and Rate Technologies, an AirSweep distributor in Canada, to troubleshoot the system. Esselstyn recommended changing the 180° mount to the standard mount for the wider 360° air blast radius, changing the pulse duration from 3 seconds to 0.25 seconds, checking the air line size and pressure, and ensuring the VA-06 was set to the proper depth in the bin. "Initial results have been positive, and the AirSweeps have been easily integrated into our automated cleanouts."

Elmira Pet Products' installation of AirSweep units to replace the vibrators and pneumatic hammers is keeping pet food ingredients flowing through their process systems effectively and safely.



Control Concepts, Inc. provides a 7-year warranty on the AirSweep® unit.

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