

Aero-Mechanical Conveyor Runs 14 Years without Change of Parts, Wire Rope

A custom provider of coffee and condiments to offices, vending machine outlets, and private label sales used a Spiroflow Systems aero-mechanical conveyor (AMC) for 14 years in its flavored coffee production operation without replacing a single part.

The Model PC3 aero-mechanical conveyor was installed by Spiroflow Systems at the Excelso Coffee & Tea Co. at its Norcross, GA production facility in 1994. Operating intermittently eight hours a day, five days a week, the AMC is used to convey flavored coffee from a V-ribbon blender to a storage hopper for packaging into coffee pouches or packages.

Excelso Coffee & Tea roasts more than two million pounds of coffee a year that it packages into hundreds of different blends. This equates to 10,000 lb or three million cups of coffee each day.

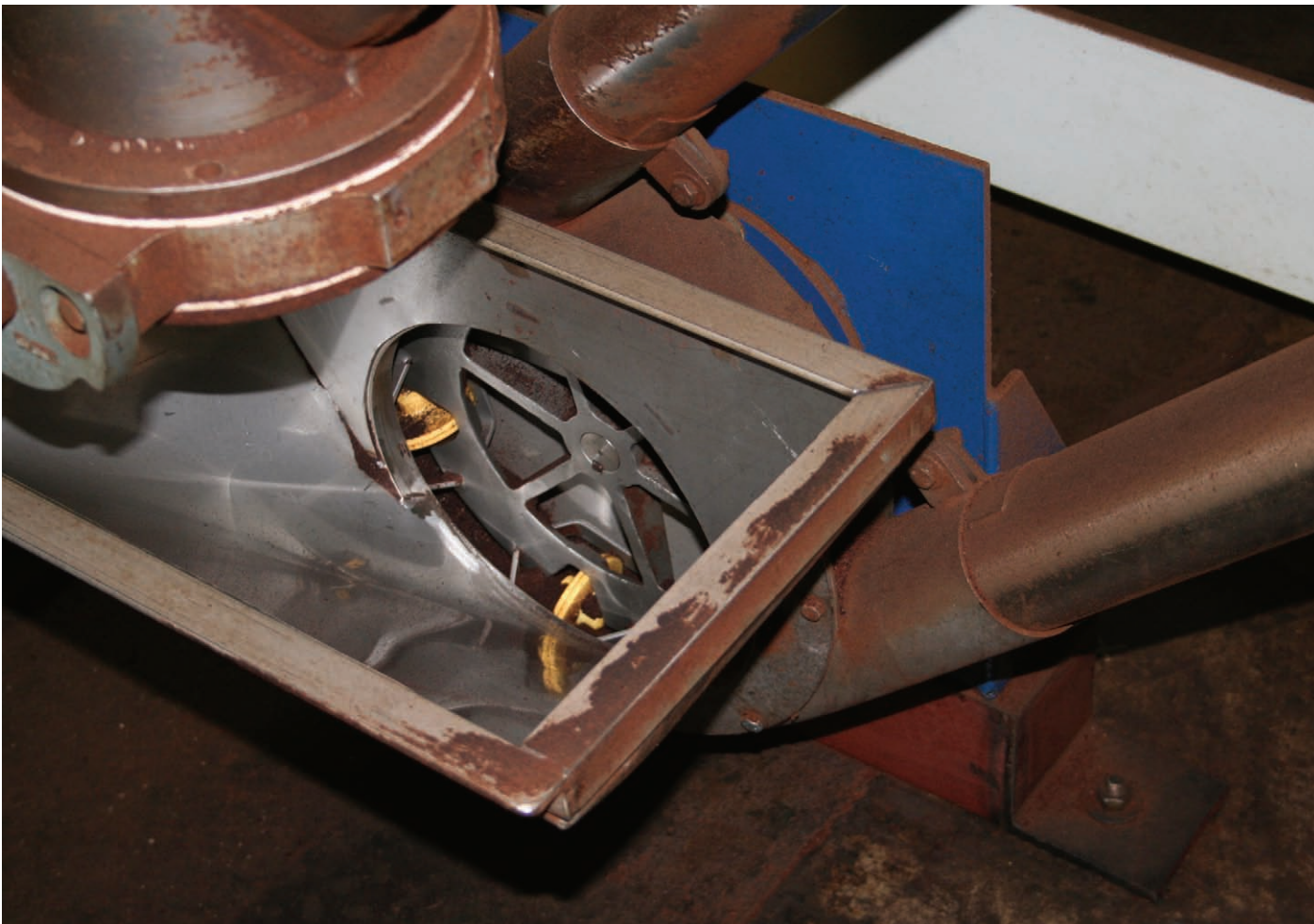
The inlet of the PC3 AMC allows for stream feeding of coffee with no product degradation. The conveyor fluidizes the conveyed product.

Through a sister company, Atlanta Coffee Time, Excelso supplies coffee in the Atlanta metropolitan area to office workers and to vending machines strategically located throughout the city. Excelso is also in partnership with companies in more than 35 states for whom coffee is custom packaged under their own brands. These companies use Excelso's formula for success by distributing coffee to office workers and vending machine operators in their respective states.

"When Excelso called and said they needed a replacement wire rope for the aero-mechanical system for the first time in 14 years, we were amazed at the life of the rope," said Mathias J. Lee, regional sales manager for Spiroflow Systems. "Normally, these ropes need to be replaced every five to seven years

depending on the application. What's more phenomenal is the fact that no other replacement part has been required for the machine. This is as much a tribute to Excelso regarding the operation and care of their equipment as it is a testament to the robust construction of the Spiroflow Aero-Mechanical Conveyor."

Allan Shaw, vice president of Excelso, recalled that Excelso initially selected the Spiroflow AMC after a thorough analysis of the various suppliers and types of conveying systems. "We mainly selected Spiroflow because of their years of experience and record for excellent after sales support," noted Shaw. "We also needed a totally enclosed system that is dust free and wouldn't alter the integrity of the flavored coffee. The AMC seemed to be the perfect fit."



Excelso Operation

Founded in 1977, Excelso's coffee beans come from all over the world but primarily from Central and Latin America. Twenty percent of coffee used by Excelso is 100 % Columbian coffee. Premium coffees are custom blended and fresh roasted daily using 100 % Arabica coffee beans. Others come from Hawaii and more than 100 different sources, most of which are in Central or South America.

"Trees don't produce the same bean each time," noted Shaw.

"Because of inconsistencies in the bean, core samples have to be continuously inspected for consistency in size and color. One bad bean can ruin 100 pounds of coffee."

After being picked, a cherry that encases the bean must be removed. This is done most often by a "wet" process at the source. The bean has to be soaked in water for approximately 24 hours. Beans not soaked or dried properly can sour.

Unflavored beans at Excelso are prepared in giant roasters, com-

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plete with automated computerized programs for each specific roast. Flavored coffee, in which the AMC plays a critical role, is prepared in a small V-ribbon blender where a syrup-type flavoring is added.

"We provide our customers with the highest quality coffee at the best possible price while delivering

CaseStudy



The Model PC3 Aero-Mechanical Conveyor (AMC) feeding the V-ribbon blender.

excellent service,” said Shaw. “To do this, we operate a facility where only the best equipment available is used, the most modern procedures are followed and where quality control is number one.”

Aeromechanical Conveyor in Action

The Spiroflow Model PC3 aeromechanical conveyor plays a critical role in conveying the coffee, after flavoring, to a hopper for storage and eventual packaging.

The AMC installed at Excelso is of a 3-in. in diameter tubular design. It is one of the most efficient methods of conveying materials such as coffee because of its gentle, dust-free, and clean handling properties. Constructed of stainless steel to counter any flavor retention from the last batch, the machine can be washed with water or other cleaning solution through a valve at the top outlet

and a drain on the bottom. At Excelso, according to Shaw, the AMC is virtually self-cleaning. The Model PC3 AMC was specifically designed to meet Excelso's requirements.

The AMC consists of a continuous loop wire rope assembly with evenly spaced polyurethane discs that move at high speed within parallel steel tubes. At each end, the rope assembly runs from one tube to another around specifically designed sprockets. One of these sprockets drives the rope and discs while the other sprocket provides tension to the rope. Tube clamps are used to support the conveyor.

The action of the rope assembly traveling at high speed creates an air stream running at the same velocity. As the flavored coffee is fed into the airstream, it is conveyed to the storage hopper where the beans are centrifugally ejected.



The Model PC3 Aero-Mechanical Conveyor (AMC) from Spiroflow Systems at Excelso Coffee & Tea Company in Norcross, GA is used to convey flavored coffee from a V-Ribbon blender to a storage hopper.

"It's a tight, well-operated system that is virtually self-cleaning," said Shaw. "We have been extremely pleased with its performance in getting the flavored coffee to the storage hopper for final packaging into customer desired quantities."

Excelso Coffee Flavoring Operation

The Excelso coffee flavoring operation consists of the Spiroflow AMC, the V-ribbon blender, and the storage hopper. The V-ribbon blender is also made of stainless steel to eliminate any flavor retention from the last batch and is tightly sealed. Its operation is completely computerized and automated. The blender is 5 ft tall and each "leg" is 8 in. in diameter.

The flavoring syrup is pumped gradually into the rotating blender in a fine, aerated mist that covers about two to three percent of the surface area. Once the syrup is added, the blender continues to tumble the flavored coffee for several minutes to assure even mixing.

The AMC can convey material at any angle between 0° and 90° at heights up to 85 ft without loss of capacity.

Once this operation is completed, a manually operated hatch on the bottom of the blender is opened and the flavored coffee is discharged into the AMC. The AMC conveys the coffee to a storage hopper. It is transferred to the hopper through a slide gate and a flexible hose.

One of the most significant features of the aero-mechanical conveying system is its ability to convey materials at any angle between 0 and 90° without loss of capacity. Excelso angled its 30-ft-long AMC at a 45-degree angle and it operates at an output speed of 243 rpm.

Excelso operates the flavoring part of the plant in one shift eight hours a day, five days a week. "We usually run 12 to 20 batches in a 4- to 5-hour run time," said Shaw. "This means each batch takes from 15 to 20 minutes. The rest of the time we clean out the blender and other equipment and purge it of any flavor. This is extremely important to maintain the precise

flavor of the next batch."

Frequently referred to as a "rope and disc conveyor," aero-mechanical conveyors (AMC) from Spiroflow Systems are ideal for transporting material up to 5/8-in. in diameter from 6 to 85 ft at rates of up to 120 tn/hr.

Benefits of the conveyor include total transfer of ingredients, low energy requirements, dust-free transport with minimal product degradation, and virtually no separation of mixtures.

The AMC can convey material at any angle between 0 and 90° at heights up to 85 ft without loss of

capacity, so its range of configurations is limitless. This enables the widest choice of system layout options using standard components to optimize available floor space. The system can be set up as a straight-line operation or in a variety of around the corner configurations.

Spiroflow is a worldwide supplier of a wide range of both standard and custom powder handling equipment. Besides aero-mechanical conveyors, the company offers flexible screw, vacuum, and pneumatic conveyors, bulk bag dischargers and fillers, flexible silos, and bag packing and

unloading equipment. For more information, call 704-291-9595 or visit www.spiroflowsystems.com.



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